USB Action Plan
September 2017
# Long-Range Strategic Plan FY17-21: Goals

Board approved July 9, 2015, Effective October 1, 2016

**CORE VALUE:** The United Soybean Board works with honesty and integrity to achieve maximum value for the U.S. soybean farmer’s checkoff investments.

**MISSION:** Maximize profit opportunities for U.S. soybean farmers by investing and leveraging soybean checkoff resources.

**VISION:** U.S. soy drives soybean innovation beyond the bushel.

**STRATEGY:** Create and enhance partnerships that increase the value and preference for U.S. soy.

<table>
<thead>
<tr>
<th>SUPPLY</th>
<th>MARKETPLACE</th>
<th>DEMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
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<tr>
<td>2</td>
<td>2</td>
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</tbody>
</table>

**SUSTAINABLE PRODUCTION**

Soybean producers use improved seed varieties and the latest production techniques to maximize profit opportunities while meeting the standards of the U.S. Soybean Sustainability Assurance Protocol.

**TECHNOLOGY**

Farmers use big data and technological advances to maximize their profit opportunities.

**INFRASTRUCTURE**

Potential partners and influencers use new information to communicate to appropriate target audiences why improvements to the transportation infrastructure are needed.

**VALUE**

The soy value chain is using an accurate definition of the U.S. soy advantage and bringing that value back to farmers.

**MEAL**

Animal and aquaculture producers seek meal made from U.S. soybeans in their feed rations because of the superior component value.

**OIL**

End users recognize, use and communicate the advantage of both conventional and high oleic U.S. soy oil.

**INDUSTRIAL USES**

Manufacturers of high value or high volume industrial products prefer U.S. soybean oil or meal as a feedstock/ingredient.

**SUSTAINABILITY**

Buyers and end users recognize U.S. soy as a sustainable and responsible choice for food, feed and industrial applications.

**FOOD EXPORTS**

Targeted food manufacturers in export markets prefer U.S. soy protein.
<table>
<thead>
<tr>
<th>Target Areas</th>
<th>Action Teams</th>
<th>Supply</th>
<th>Marketplace</th>
<th>Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal</td>
<td>Production Research</td>
<td>SUSTAINABLE PRODUCTION</td>
<td>TECHNOLOGY</td>
<td>MEAL</td>
</tr>
<tr>
<td></td>
<td>Market Research</td>
<td>VALUE</td>
<td>INDUSTRIAL USES</td>
<td>FOOD EXPORTS</td>
</tr>
<tr>
<td></td>
<td>Product Research</td>
<td>OIL</td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td>INDUSTRIAL USES</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product Research</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sustainabilty</td>
<td>Production Research</td>
<td>SUSTAINABLE PRODUCTION</td>
<td>TECHNOLOGY</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Market Research</td>
<td>INFRASTRUCTURE</td>
<td>VALUE</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Product Research</td>
<td>SUSTAINABILITY</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Communications
Priority Audience by Action Team

SUPPLY

Farmers | Public and Private Researchers | Input and Seed Companies

MARKETPLACE

Regulators and Influencers | Transportation Users | Transportation Companies | Elevators
Sales Desk | Crushers | Buyers (Feed Mills and Oil Refiners)

DEMAND

Crushers | Buyers (Feed Mills and Oil Refiners) | Feed Mill Nutritionists | End Users

## UNITED SOYBEAN BOARD
### SUMMARY BUDGET
#### FOR FISCAL YEAR ENDING SEPTEMBER 30, 2018

<table>
<thead>
<tr>
<th>FY2018 WORKING BUDGET</th>
<th>FY2018 TENTATIVE APPROVED BUDGET</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BUDGETED OPERATING REVENUE</strong></td>
<td></td>
</tr>
<tr>
<td>QSSB Collections</td>
<td>$ 90,000,000</td>
</tr>
<tr>
<td>Investment Income</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Budgeted Operating Revenue</strong></td>
<td>$ 90,000,000</td>
</tr>
</tbody>
</table>

| **BUDGETED PROGRAM EXPENDITURES** |                                      |
| Meal Target Area              | $ 27,905,747 979,646 28,885,393     |
| Oil Target Area               | 24,263,764 1,215,272 25,479,036     |
| Sustainability Target Area   | 16,938,332 354,370 17,292,702      |
| Seed Industry Partnership - HOS | 4,000,000                       |
| Allocations to Strategic Objectives | (69,107,843) 0 69,107,843        |
| ASA Communication Proposal   | 19,000,000 (310,932) 18,689,068   |
| USB Managed - Program Implementation | 5,000,000 977,001 5,977,001      |
| USB Evaluation of Programs   | 1,942,157 0 2,006,464             |
| **Total Program Funding**    | $ 97,107,843 0 3,215,357 100,323,200 |
| **USB Evaluation of Programs** | 1,942,157 0 2,006,464             |
| **Total Programs & Evaluation** | $ 99,050,000 0 3,279,664 102,329,664 |

| **BUDGETED NON-PROGRAM EXPENDITURES** |                                      |
| USDA                                  | 350,000 350,000                     |
| Administrative                        | 4,500,000 4,500,000                 |
| QSSB Assessment Credits               | 100,000 100,000                     |
| **Total Non-Program Expenditures**   | $ 4,950,000 0 0 4,950,000           |

| **Total Budgeted Operating Expenditures** | $ 104,000,000 0 3,279,664 107,279,664 |

| **BUDGETED OPERATING SURPLUS(SHORTFALL)** |                                      |
| (A)                                      | (14,000,000) 0 (3,279,664) (17,279,664) |
### FY2018 ALLOCATION by Strategic Objective

<table>
<thead>
<tr>
<th>Target Areas:</th>
<th>MEAL</th>
<th>OIL</th>
<th>SUSTAINABILITY</th>
<th>USB MGD Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1: Sustainable Production</td>
<td>6,005,149</td>
<td>3,154,289</td>
<td>6,274,905</td>
<td>15,434,343</td>
</tr>
<tr>
<td>S2: Technology</td>
<td>2,232,460</td>
<td>242,638</td>
<td>1,693,833</td>
<td>4,168,931</td>
</tr>
<tr>
<td>M1: Infrastructure</td>
<td>350,000</td>
<td>0</td>
<td>0</td>
<td>350,000</td>
</tr>
<tr>
<td>M2: Value</td>
<td>5,299,623</td>
<td>4,718,054</td>
<td>4,562,116</td>
<td>14,579,793</td>
</tr>
<tr>
<td>D1: Meal</td>
<td>12,278,529</td>
<td>7,756,923</td>
<td>11,839,592</td>
<td>37,124,064</td>
</tr>
<tr>
<td>D2: Oil</td>
<td>7,756,923</td>
<td>0</td>
<td>4,411,848</td>
<td>7,756,923</td>
</tr>
<tr>
<td>D3: Industrial Uses</td>
<td>2,232,460</td>
<td>9,607,132</td>
<td>4,411,848</td>
<td>11,839,592</td>
</tr>
<tr>
<td>D4: Sustainability</td>
<td>4,411,848</td>
<td>0</td>
<td>837,172</td>
<td>4,411,848</td>
</tr>
<tr>
<td>D5: Food Exports</td>
<td>837,172</td>
<td>37,124,064</td>
<td>0</td>
<td>37,124,064</td>
</tr>
</tbody>
</table>

**Committed Allocation to Strategic Objective**: 28,885,393, 25,479,036, 17,292,702, 0, 71,657,131

**Total Program Funding for FY2018**: 28,885,393, 29,479,036, 17,292,702, 24,666,069, 100,323,200 (1A)

**Board Percent of TA funding excl HOS**: 27,857,761 40.31%, 24,572,589 35.56%, 16,677,493 24.13%, N/A, 69,107,843 100.00%
FY2018 Market Environment

Soybean acres reached a record high in 2017 but did not eclipse the USDA National Agricultural Statistics Service (NASS) prediction that soybeans would overtake corn in acreage planted for the first time since the payment-in-kind program began. The USDA March survey had corn at 89,996,000 acres and soybeans at 89,482,000 acres, but the planting season’s excessive wet weather across many states seems to have influenced farmers to change some intended corn acres, already down 4 percent from 2016 over to soybean, which were already up 7 percent. Some experts predict soybean acreage to cross 90,000,000 acres planted.

Many soybean farmers who also grow corn know last year’s record yield influenced this year’s soft corn market. In an effort to avoid this trend for soybeans, United Soybean Board (USB) strategy is focused on the compositional quality of soybeans over yield alone. China’s approved imports for Monsanto’s Vistive© Gold will help drive that message home as global regulatory barriers, once slowing high oleic acreage growth come down. This announcement comes in time to give momentum to planting more high oleic acres in 2018 with USB’s goal of 18 million acres by 2025.

A new administration in Washington, D.C., is working on modernizing major trade agreements and focusing efforts at USDA on rural development and trade. 2018 will be a challenging ag marketplace where the USDA puts the average price of soybeans at $9.60 a bushel, up 10 cents from 2016. Good news is that much of the crop has already been sold at higher prices.

Compositional quality means looking at all the parts of the soybean and determining how to create and capture the most value from each part. With this strategy, U.S. soy’s nutritional bundle will continue to fill the global demand, which is growing at a rate of up to 350 million bushels per year. For 2017 the USDA Economic Research Service (ERS) has soybean export value raised $900 million to $22.6 billion. China continues to drive global demand and the projected higher export value. A strengthening Brazilian currency is reducing price discounts from South America and will continue to challenge the U.S. market.

The following observations and statistics were compiled from contractor reports, strategic reporting materials and the ERS.

Meal

As of June, USDA forecast the 2016/2017 soybean crush at 1.91 billion bushels. Softer domestic demand has meant a midyear downward price trend for soybean meal. Competitively priced grains and distiller’s dried grains and solubles (DDGS) and large supplies expected from South America, are expected to place continued downward pressure on soybean meal prices. Political crisis in Brazil has had, and might continue to have, significant impact on soybean prices and exports. As problems increase, the real weakens, thus stimulating sales by Brazilian farmers and sending futures prices lower.

USDA projects soybean meal exports for 2017/18 at 12,400,000 tons, up from 12,000,000 tons in the previous year. WASDE shows soybean meal domestic disappearance up to 34,200,000 tons from 33,150,000 in 2016/17. This shows increased demand for both areas. However, the soybean carry out surging to 450 million bushels this year and 495 million in 2017/18 means too much focus on yield over
value often leaves supply issues moot. Challenging ending stocks means cash basis and CME price will struggle to appreciate.

Even though overall 2017 soybean export value is raised $900 million to $22.6 billion, ERS lowers meal $200 million to $4 billion. The reduced soybean meal export value is based on lower projected volumes and marginally lower unit prices. Soybean meal is 25 percent less expensive versus one year ago. Lower prices classically stimulate demand which should also be a positive impact on feeder margins.

However, DDGS are currently down 42 percent in price from last year, and corn is 12 percent lower. Synthetic amino acid manufacturers are increasing prices, production and profits as feeders switch to DDGS, requiring more added amino acid in diets. Soybean meal is still the gold standard of feed ingredients, but competition is pricing itself to capture additional market share.

Major domestic processors continue investment in new soybean plants and improving existing facilities, leading to positive, overall long-term preference for U.S. soybean meal. New synthetic amino acid production facilities are poised to compete and add pressure as canola meal tightens competition for market share.

Compositional value with a focus on the nutritional bundle is more important than ever as a distinction between natural and synthetic protein. Higher protein levels are critical to U.S. soybean meal’s competitiveness to build preference with end users with a focus on animal nutritionists and processors. USB’s strategy includes direct outreach, increased communications and education efforts with end users and all who influence buying decisions.

Oil

The market outlook for oil starts in the field with expectations on production, currently targeting around 90 million acres of soybeans being planted in 2017, which would be a record domestically. Demand for whole bean and meal look to be strong, as animal numbers and protein demand are forecasted to grow throughout 2017 and 2018. Soybean oil is possibly the weak leg of the three-legged stool.

Domestic consumption of fats and oils continues to decline in developed nations such as the United States. ERS reports cumulative domestic use for October 2016–April 2017 at 11.15 billion pounds is down nearly 3 percent compared to last year. Consumers are changing their dietary habits, eating more snacks and less formal meals. Finding a home domestically for commodity oil will continue to be a challenge in 2018; working on strategies that defend current consumption will be a high priority in the food category.

For non-food segments, the outlook is brighter as pointed out below. Biodiesel is nearly 303 million pounds ahead of the 2015/16 pace. Biofuels and home heating oil are growth targets that will be needed to absorb the additional oil being displaced in the food category. Anticipated changes in regulations between buys and blenders credit programs should displace incoming oils such as palm and palm menthol esters from hitting U.S. shores, placing more emphasis on domestic feed stocks and pushing more placements for domestic soybean oil.

Good demand for beans and meal is driven by a growing population and the development of a larger middle class with greater disposable income globally. This demand for additional protein outside of
North America will lead to additional placement of whole bean and meal options, while domestically we will be challenged with oil placement driven by historically large U.S. and South American soybean crops.

USB’s strategy in oil is to build preference in both the food and industrial uses sectors for both commodity soybean oil and high oleic soybean oil by focusing on compositional quality of U.S. soybeans. Value is captured from all parts of the soybean for a growing diversity of uses and products. Oil strategy starts at seed selection and continues through harvest, identity preservation and filling the needs of end users.

**Sustainability**

Sustainability continues to drive the U.S. Soy Advantage over competitive markets. A common occurrence for most predicted numbers from U.S. soy competitors are reported threats from sustainability challenges such as poor infrastructure and transportation, which could be exacerbated by not being able to deal with extreme or even consistent poor weather conditions. USB and the U.S. Soybean Export Council (USSEC) are committed to the continuous improvement of the U.S. Soybean Sustainability Assurance Protocol (SSAP) certification program, which continues to gain global awareness and support.

In 2015/16 total SSAP shipments certified were 1,538 or 5,876,809 metric tons (MT). Current marketing year statistics from 09/01/2016 through 08/31/2017 have the total U.S. Soy Sustainable Allocation at 73,475,800 MT with total certified shipments at 2,409. The total certified weight shipped is at 9,785,135.7 MT from 55 certified current active companies. This measured accountability of U.S. soy is a critical driver of demand.

Precision agriculture is another major influence on the 2018 market environment, as more soybean farmers continue the adoption of technology and use of big data. To reach USB goals for technology, look for more farmer-to-farmer education to help leverage hardware and data already owned, but not fully utilized by farmers. Decreasing inputs and increasing the compositional quality of yield means greater profit opportunities while strengthening the U.S. Soy Advantage.

Continuous improvement of U.S. soy supported by measurement and transparency means U.S. sustainability performance builds trust with the entire value chain but especially with domestic and international end users.
MEAL

SUMMARY STRATEGY:
The soy checkoff is focused on building preference for U.S. soybean meal primarily in the feed markets, with some additional opportunity in industrial uses and the food markets in Taiwan and Indonesia. USB accomplishes this by differentiating U.S. soybean meal through promotion and research, with an emphasis on high value and constituent/component-based meal that will meet the needs of end users.

STRATEGIC APPROACH:
USB will help develop, communicate and capture the full value of U.S. soybean meal in feed, food and industrial applications.

OIL

SUMMARY STRATEGY:
The soy checkoff is focused on building preference for U.S. soybean oil in the food and industrial markets. USB accomplishes this by differentiating U.S. soybean oil through promotion and research.

STRATEGIC APPROACH:
Build preference for U.S. soybean oil in the food and industrial markets differentiating U.S. soybean oil through promotion, as well as research. Research will showcase the functionality and versatility of U.S. soybean oil specifically as it relates to high oleic soybean oil.

SUSTAINABILITY

SUMMARY STRATEGY:
U.S. soy will be the preferred raw material choice for buyers and end users to meet their sustainability and responsibility goals.

STRATEGIC APPROACH:
Effectively enhance and communicate U.S. soy sustainability performance so that buyers and end users prefer U.S. soy as the best raw material choice to meet their own sustainability and social responsibility goals. Drive a coordinated sustainability message across the entire value chain.
Users of oil seeds have many choices. It’s no longer enough to simply grow soybeans; now’s the time to grow better soybeans in order to increase preference and continue building demand. Differentiating our soybeans based on meal and oil quality and sustainability will help our products stand out in this highly competitive environment.

The soy checkoff helped farmers build the U.S. Soy Advantage, but it’s not something we should take for granted – it should be grown just like we grow our soybean crop. Improvements are needed in our meal, oil and sustainability programs to stay ahead of the competition.

Below, you’ll see how USB plans to make those improvements. Divided by target area, this is the story of how USB will lead U.S. soybean farmers to greater profit opportunities. Though written as three separate stories, the work of each target area comes together as a single plan to benefit U.S. farmers. For example, sustainability plays a role in meal and oil sales; market access is critical to all three target areas; and the ability to identity preserve soybeans with new and improved composition is relevant to both meal and oil. Each target area and each goal must work together to achieve USB’s mission and vision.
MEAL EXECUTIVE SUMMARY

The soy checkoff will build preference for U.S. soybean meal primarily in the feed markets by differentiating U.S. soybean meal through promotion and research, with an emphasis on high value and constituent/component-based meal that will meet the needs of end users. USB will pursue additional opportunities in industrial uses and the food markets in Taiwan and Indonesia.

Part of the soy checkoff’s role is to know what end users need from U.S. soybean meal and make sure those needs are met through research, development and adoption of seed technology. USB is committed to continually staying up to date on end-user demands. We have a system in place to keep the research pipeline full of meal innovations, keep the marketplace happy and keep the demand pulling the value through the system.

There is a lot more value in soybean meal that can be realized by everyone from the farmer to the end user. USB’s six goals in the Meal Target Area focus on how to unlock it. For most meal end users, the value of soybean meal is in the nutritional bundle – the protein/amino acids, energy and minerals – that animals eat. So by maximizing those constituents, the product’s value increases. USB’s meal strategy focuses on demand pull-through of innovative and value-enhanced meal products and capture of the value throughout the chain. In addition to animals, meal improvements can also be pulled through by food and industrial markets.

Here are the desired outcomes and what it will take to achieve USB’s meal strategy.

<table>
<thead>
<tr>
<th>SUPPLY</th>
<th>MARKETPLACE</th>
<th>DEMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved nutritional bundle in U.S. soybean meal supply</td>
<td>Ability and willingness to capture value of higher-quality meal throughout chain</td>
<td>End users demanding and paying for higher-quality meal</td>
</tr>
<tr>
<td>Genetic Improvements</td>
<td>Industry Research</td>
<td>Feed Industry Outreach</td>
</tr>
<tr>
<td>Research to improve nutritional bundle.</td>
<td>Gather market intelligence on marketplace audiences.</td>
<td>Demonstrate U.S. meal quality and communicate it with feed mills and nutritionists around the world. Continue to help optimize feed formulas to drive efficiency and demand.</td>
</tr>
<tr>
<td>Variety Improvements</td>
<td>Value Chain Outreach</td>
<td>Meat Exports</td>
</tr>
<tr>
<td>Engage seed companies to improve meal in commercial varieties.</td>
<td>Communicate how to attain greater value from high-quality meal.</td>
<td>Promote U.S. meat and poultry abroad through food service and grocery.</td>
</tr>
<tr>
<td>Farmer Adoption</td>
<td>Partnerships</td>
<td>Industrial Research</td>
</tr>
<tr>
<td>Encourage planting of new, high-quality varieties.</td>
<td>Collaborate with partners to explore the feasibility of incentive program based on IP or quality.</td>
<td>Develop technology and communicate to enable greater meal use.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Human Consumption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Build preference through technical support in targeted markets.</td>
</tr>
</tbody>
</table>
The soy checkoff will build preference for U.S. soybean oil in the food and industrial markets by differentiating U.S. soybean oil through promotion and research.

There’s value in soybean oil – lots of it. Even though oil makes up only about one-fifth of the soybean, it makes up at least one-third of the value. There are opportunities for farmers and the rest of the U.S. soy industry to capitalize on that value by promoting and improving upon soy oil’s attributes to create demand from end users to be pulled through the value chain.

USB has five goals in the Oil Target Area, and all are crucial to improving value, demand and farmer profitability. To maximize value, every link in the value chain must work together. For most end-users, the value of soy oil is in its functionality. So, by increasing functionality to meet those needs, true value can be realized, but must be captured and shared throughout the chain to benefit farmers. For this to happen, USB will conduct research to identify beneficial genetics, partner with seed companies to use the oil improvements in their germplasm and promote new technology adoption to farmers. But, other parts of the value chain are also critical to success. USB will help the value chain understand the U.S. soy advantage, along with supporting methods to help capture and share the value. In the end, it’s about getting the end users to pay for the value of the product they need.

Here are the desired outcomes and what it will take to achieve USB’s oil strategy.

<table>
<thead>
<tr>
<th>SUPPLY</th>
<th>MARKETPLACE</th>
<th>DEMAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased soybean oil concentration and quality, increased supply of high-oleic</td>
<td>Ability and willingness to capture value of higher-quality oil, including high-oleic, throughout chain</td>
<td>End users demanding and paying for better quality soybean oil/attributes/functionality, including high oleic</td>
</tr>
</tbody>
</table>

Public Researcher Collaboration
Support research to use genetic variation, physiological pathways and markers to increase oil content.

Seed Company Collaboration
Support seed company efforts to improve U.S. soy oil

Tech Transfer
Inform farmers how to increase value through better quality, including high-oleic.

Gather Intelligence
Conduct research to increase understanding of key audiences.

Educate On Attributes
Inform value chain audiences of attributes of U.S. soy oil and its ability to meet end-user needs.

Component Pricing
Conduct outreach among industry based on oil advantages and benefits of component pricing.

Educate On Advantage
Communicate U.S. Soy Advantage vs. competition.

Nutrition Opportunities
Showcase U.S. soy oil’s nutritional benefits in new ways.

Performance Benefits
Showcase U.S. soy oil’s performance benefits for food in new ways.

Industrial Research
Support research and promotion of biodiesel and other industrial products.
**SUSTAINABILITY EXECUTIVE SUMMARY**

U.S. soy will be the preferred raw materials choice for buyers and end users to meet their sustainability and responsibility goals.

In order to increase preference for and the value of U.S. soy, we must promote not only soy’s product attributes, but also its sustainability because end users demand both. Producing a sustainable supply of high-quality soy takes a lot more than just caring for the environment. It requires matching the outcomes of sustainable farming practices – energy efficiency, nutrient reduction, water quality, soil health – to the attributes end users most desire. Ultimately, we want to connect those outcomes to value that gets transferred to every link in the chain all the way back to the farmer. End users in the U.S. and around the world want to know how their food is produced, and U.S. soy has a great story to tell.

Getting the industry ahead of end user demands will help USB achieve the five goals across the Sustainability Target Area. For farmers, it starts with management systems that position them ahead of end-user demands, being able to deliver the sustainable outcomes end users need before they need it. For the value chain, USB must share U.S. soy’s sustainability story, the value of sustainability to end users and the need to capture it throughout the industry. Regulators, influencers and the transportation sector play an important part in providing sustainable soy through technology acceptance, market access and infrastructure improvements. Sharing our sustainability metrics with buyers and end users will make them more comfortable with U.S. soy and the value it brings to them.

Here are the desired outcomes and what it will take to achieve USB’s sustainability strategy.

<table>
<thead>
<tr>
<th><strong>SUPPLY</strong></th>
<th><strong>MARKETPLACE</strong></th>
<th><strong>DEMAND</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improved sustainability performance of U.S. soy</strong></td>
<td><strong>Value of U.S. soy’s sustainability captured and shared throughout the chain</strong></td>
<td><strong>Buyers and end users recognize and pay a premium for U.S. soy because of its sustainability.</strong></td>
</tr>
</tbody>
</table>
| **Researcher and Stakeholder Collaboration**  
Research to identify BMPs and data services that enhance on-farm sustainability.  
**Farmer Adoption**  
Drive awareness and use of technology and management systems that result in the sustainability outcomes desired by end users. | **Multi-Stakeholder Efforts**  
Drive coordinated key messages related to the U.S. soy advantage which includes the positive sustainability story of U.S. soy.  
**Market Access**  
Drive understanding of the role of on-farm innovations, including biotechnology and nutrient management to enable sustainability; the need for quick approvals for those innovations; and how those innovations connect to sustainability. Build awareness of the U.S. Soybean Sustainability Assurance Protocol.  
**Infrastructure Investments**  
Communicate competitive advantage of transportation infrastructure and understand the investments needed to improve it. Collaborate on a public/private partnership to create funding sources for infrastructure improvements. | **Anticipate Needs of Buyers and End Users**  
Communicate the metrics that show the sustainability of U.S. soy and how those metrics match the needs of end users, which translates into increased demand. Build on international approval of the U.S. Soy Sustainability Assurance Protocol to differentiate and build preference for U.S. soy. |
Meal Target Area

FY18 Final Portfolio

July 20th, 2017
Meal TA Portfolio Balance by Risk Reward

The graph shows the balance between risk and reward for the Meal TA Portfolio. Points are categorized as not funded (red diamond) and funded (black circle). The data points cluster in the high risk, high reward quadrant, indicating a high-risk strategy with potential for significant returns.

Value Creation Framework: FY18 Portfolio 7/20/2017
Meal Target Area Portfolio Spend by Track

**Where to Play?**

- **EXISTING**
  - Customers/Value Chain

- **NEW**
  - Customers/Value Chain
    - New Volume
      - 12%
    - Existing Core
      - 65%
    - Breakthrough
    - Differentiate US Soy
      - 23%

**How to Win?**

- **EXISTING**
  - Products & Production
- **NEW**
  - Products & Production

Value Creation Framework: FY18 Portfolio 7/20/2017
Meal Target Area Portfolio Spend by Program Maturity

<table>
<thead>
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Value Creation Framework: FY18 Portfolio 7/20/2017
Meal Target Area Portfolio Spend by Program Goal

- Food Exports: 21%
- Industrial Uses: 18%
- Meal: 39%
- Sustainable Production: 12%
- Technology: 6%
- Value: 3%
- Unallocated: 1%
Meal Target Area Portfolio Spend by Audience

- **End Users**: 36%
- **Buyers**: 15%
- **Public Researchers**: 15%
- **Seed Companies**: 4%
- **Feed Mill Nutritionists**: 8%
- **Farmers**: 4%
- **Unallocated**: 13%
- **Elevators**: 3%
- **Crushers**: 2%
- **Researchers**: 15%

Value Creation Framework: FY18 Portfolio 7/20/2017
Section A: PROPOSAL SUMMARY

Previous USB farmer outreach campaigns have successfully increased awareness and understanding of the primary uses of U.S. soy. Many farmers understand that their soybean meal is used to feed livestock around the world while the oil is used in food and industrial applications, including biodiesel. However, many farmers do not realize how the meal and oil components of their soybean affect its value. To help build this understanding and pave the way for future value capture opportunities, USB will distribute an issue of Beyond the Bean. The magazine issue will focus on building farmer awareness of soybean meal end user needs, and how meeting those needs provides the opportunity to boost soybean meal quality and its associated value. This issue of the magazine is one piece of a greater plan to connect with all members across the value chain to create change on opportunity for additional value capture. Greater farmer awareness and understanding now will lay the groundwork for long-term improvements in protein quality and a component value capture system.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The checkoff’s goal of shifting the way soybeans are valued based on meal and oil levels is no small feat. The goal of shifting the pricing structure from one of quantity only to one of component value too is no small feat. To enact this change, it’s vital that U.S. soybean farmers understand how their soybeans are valuable beyond yield. This issue will lay the foundation needed to begin the shift from not only quantity but quality, too. It’s a crucial first step in giving U.S. soybean farmers consistent, accurate information, helping them someday reap the rewards of being compensated for the yield and compositional quality of their beans.

2: Value Impact

For more than a decade, Beyond the Bean has been the flagship publication and key communications vehicle for the checkoff. USB’s Producer Attitudes Surveys continue to show a correlation between those farmers who receive Beyond the Bean and those who support the checkoff. More than two-thirds of those surveyed recall receiving the magazine – a recall rate comparable to that of industry-leading, weekly publications. Through this trusted resource we’ll show how the checkoff is working to increase profit opportunities for U.S. soybean farmers by identifying new ways to capture value for soybean quality. This approach puts USB’s messaging in the hands of more than 300,000 U.S. soybean farmers, and primes them for enabling USB’s value capture vision. By communicating broadly to U.S. soybean farmers, USB also demonstrates visible leadership to others in the value chain in advancing a transparent value-capture system that rewards farmers for both yield and quality of their meal and oil.

3: Execution Feasibility

Helping farmers truly understand the value of their soybean components will not be accomplished overnight. But it is feasible with smart, well-timed and frequent messages distributed in a variety of ways. This approach is required to support an eventual shift in how farmers are paid for their product. USB communications staff have produced Beyond the Bean for more than a decade, with a well-documented process for developing content and the magazine’s layout. We have a long history of drafting, designing and producing the magazine. We’ve won industry awards for the magazine from organizations like the National Agri-Marketing Association, Ag Relations Council and PR News.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

USB directors specifically requested a conservative approach to the Energy + roadmap with an emphasis on feeding trials to determine the practical implications on animal performance by converting RFOs into increased metabolizable energy. It has been calculated that a 100 kcal/lb increase in metabolizable energy would translate into a $0.50/bushel increase in SBM value for the end user which translates to $650 million for the U.S. livestock feeding industry based on current SBM usage. Feeding trials are needed to determine the level of genetic RFO reduction required to attain a profitable improvement in animal performance. This project supplies experimental germplasm for feeding studies with new mutations and combinations of mutations for experimental genotypes. In addition, the program supports commercial variety development by breeding germplasms with a valuable and enhanced nutritional bundle. Activities include both, applied and basic research, designed to prepare for commercialization of carbohydrate traits, and define the economic value of low oligosaccharides and high sucrose composition using animal feeding studies.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This project engages with end users to determine the value of reducing oligosaccharides in soybean meal and increasing sucrose. The livestock feeding segment of the industry is the real winner in this approach, but the ultimate result will be increased demand for soybean meal because of its enhanced nutritional value. This program has engaged with seed companies as well to determine interest in this approach for developing a more desirable soy product. The livestock feeding industry, primarily poultry and swine, is the largest consumer of soybean meal. In the 2014-2015 marketing year total domestic consumption of soybean meal was the equivalent of 1.3 billion bushel of soybean based on USDA statistics. This proposal directly addresses the Energy + roadmap of the USB LRSP and the key objective of creating innovation that improves soybean meal composition that can be incorporated into commercial products.

2: Value Impact

Based on numerous published analyses, carbohydrates make up approximately 30% of the soybean seed. Of this, 21% is fiber, or insoluble carbohydrates that make up the cell walls and seed coat. The other 9% is comprised of soluble carbohydrates, including the raffinose family oligosaccharides (RFOs) that are indigestible by humans, swine and poultry. These carbohydrate components of the meal fraction of soybean provide no value to animal feeders, and take up space in rations. Any replacement of the indigestible carbohydrate fraction with digestible high energy components, such as sucrose, would improve the value of soybean meal by allowing more SBM to be included in balanced rations. It is estimated that a 5.5-6.0% increase in sucrose would result in a 100 kcal/lb increase in metabolizable energy which translates to a $0.50/bushel increase in value to the end users which translates to $650 million for the U.S. livestock feeding industry based on current SBM usage. Even though there does not seem to be an immediate return back to the farmers growing these specific varieties (when available), the future effect of this program will be an increased preference of US Soy due to its enhanced value as nutritional bundle.

3: Execution Feasibility

This research team has been in place for four years and has been very successful at identifying key genes involved in RFO synthesis and mutations for those genes that result in reduced RFOs. This proposal plans to continue efforts to evaluate new sources of variation for RFO reduction and sucrose increase, but the primary focus is the evaluation of lines that have been developed in feeding trials to determine the practical significance of the Energy + concept to livestock feeders. The team plans to engage with the USB Animal Nutrition Working Group which has representation from most of the major livestock integrators. The proposed work uses very well established research protocols. The only potential concern is effectively processing small batches of soybean meal without damaging its composition due to heating.

Section C: SPECIAL CONSIDERATIONS (optional)

Per the Directors’ desires, the research team is focusing to a large degree on evaluating this concept through livestock feeding trials.
PROPOSAL ON A PAGE

Section A: PROPOSAL SUMMARY

- Main deliverable is development of germplasm and lines that show enhanced value with improved seed composition/quality traits such as increased protein and key amino acid content, increased oil content, high oleic and other modified oils, and high sucrose content for improved soy meal, each in combination with the most improved performance for yield and agronomics plus improved defense packages.
- Germplasm and lines developed by public breeders provides a steady pipeline of offerings to private seed companies which obtain confidential licenses and commercialization agreements with each respective university or institution. This becomes even more important as quality traits are further developed as most seed companies currently dedicate little to this area.
- Proposal provides continued support of the USDA Uniform Trials, specifically for quality trait lab analyses, analysis of data, publication and communication of results.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP Sustainable Production goal aimed at developing soybean varieties for farmers, including compositional traits such as high protein, improved amino acid content, high oil, modified oils, etc.
- Addresses Sustainability Supply Road Map goal to support regional cooperative projects with unified strategy – in this case, a cooperative effort of nearly 20 public breeders in most soybean growing areas that cooperatively test advanced lines for quality and agronomic performance.
- The development and testing of germplasm and lines against elite commercial checks occurs across all market areas, geographies, from Maturity Group 00 to VII.
- Seed companies routinely inspect the data and information from the Uniform Trials searching to fill needs and opportunities within their pipelines to ultimately license the lines either/both as parent stock in breeding or directly as a variety release.

2: Value Impact

- Variety choice is the top on-farm input impacting yield and return to the grower. This project supports the development of a wide number and diversity of lines that make their way into private seed company lineups to ensure superior yield and agronomic performance as well as wide number of choices to fit the wide diversity of environments in the U.S.
- The development of lines and varieties with improved quality traits is essential to improving the overall value and profitability of U.S. soybean, as this project supports in a large way the testing and validation of quality-trait varieties that can lead to commercial releases with improved quality.

3: Execution Feasibility

- This proposed project was expanded in FY17 by the Supply Action Team to integrate the USB Quality Traits project with the USDA Uniform Trials to create a rigorous variety testing program evaluating both yield and quality trait performance plus screening for resistance to nematodes and several diseases.
- The integration also included uniting the USDA North and South regional testing program into one collaborative unit.
- The USDA Regional trials have existed since 1949 and currently operate as a cooperative testing program where nearly 20 breeders offer their time and test sites in kind.
- The bulk of the funding support still comes from the USDA, yet with USB support USDA has been able to expand the program per USB request and the relationship has fostered a positive partnership that is responsive to USB needs.
- The expansion of the program has the full backing of the USDA’s National Program Director for Oilseeds located in Washington DC.

Section C: SPECIAL CONSIDERATIONS (optional)

- Public breeding programs are significantly supported by the respective QSSBs in each state, USDA and through individual check-off projects funded by USB and regional boards such as NCSRP, MSSB, and SSRP.
This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
This program combines three activities (Activity A - Discover Sources, Genes and Develop U.S. Adapted Germplasm with Improved Protein Quantity and Quality Utilizing Diversity in Cultivated and Wild soybeans ($1,506,827), Activity B - Utilizing unique genetic diversity to combine elevated protein concentration with high yield in new varieties and experimental lines ($515,426) and Activity C - Soybean germplasm with improved seed protein ($71,031)) that address the USB LRSP goal of genetically increasing soybean seed protein using advanced breeding techniques. The three activities each take slightly different approaches, but all contribute to the Protein + Roadmap through seeking new sources of genetic variation for increased soybean seed protein without reducing yield or oil content. These activities all fit the directors’ desire for moderate to innovative competitive approaches. Both Activity A and Activity B are programs that were funded in FY17 and are building off of past developments. Activity C is evaluating a population of soybeans mutagenized with ethylmethanesulfonate (EMS) that produced many lines with modified genes involved in protein synthesis and storage. These activities have significant potential to improve soybean protein content to produce 50% protein soybean meal while maintaining or improving yield, which would mean a $1.6 billion increase in the value of the U.S. soybean crop. The activities are not interdependent, but approach increasing seed protein from different perspectives to significantly enhance the possibility of reversing the trend of declining protein content in soybean seeds for the past 30+ years.

Section B: EVALUATION CRITERIA

1: Strategic Importance

The goal of USB efforts related to seed protein improvement is to increase protein without reducing yield or protein quality (content of essential amino acids). This program builds on previous projects that have identified genes related to seed protein content and developed new genetic resources from diverse genetic backgrounds. The Protein + roadmap of the LRSP is focused on identifying genetic means to increase seed protein in the soybean plant that do not reduce seed yield or oil content. The multiple approaches represented here each have the potential to identify significant improvements in soybean seed protein content without negatively impacting yield or oil content. Seed companies have already expressed significant interest in the diverse soybean lines produced in these projects and have tested them in their own programs. The seed companies continue to express interest in diverse germplasm developed by the public sector to expand the diversity in their own breeding populations.

2: Value Impact

Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluation of varieties released from 1920 through 2010. Evaluation of protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units in protein per year. This continual decline in protein has resulted in processors having difficulty meeting the minimum 47.5% protein content required for high-protein meal designation. In fact, last year CME proposed lowering the trade rules for high-protein meal because of the inability to meet the current standard. Increasing soybean meal protein from 48 to 50% on all soybean production would result in a $1.6 billion value increase for the soybean industry. It would also thwart pressure from other protein sources that are threatening soybean market share due to declines in soybean seed protein.

3: Execution Feasibility

Two of these activities represent continuing programs that have made significant progress toward identifying new sources of genetic variation for seed protein content. The third activity has been offered by a senior scientist who is well recognized in the soybean breeding community. All of these activities are using proven and widely accepted soybean breeding techniques to identify and develop new sources of variation. This activity has support from the following QSSBs:

- Iowa Soybean Association $50,000
- Michigan Soybean Promotion Council $60,000
- Mississippi Soybean Promotion Board $24,900
- Minnesota Soybean Research and Promotion Committee $60,000
- Missouri Soybean Merchandising Council $65,000
- Ohio Soybean Council $140,000
- South Carolina Soybean Board $ 15,000
- Georgia Soybean Commodity Commission $ 43,000
- Tennessee Soybean Promotion Board $104,000

In addition, each of these research programs have significant in-kind support for their soybean breeding efforts in the form of laboratories, field sites and support staff totalling over $2 million in additional support.

Section C: SPECIAL CONSIDERATIONS (optional)

Activity A is developing genetic markers and advanced germplasm lines based on the protein alleles on chromosome 15 and 20 along with evaluation of new sources of variation derived from crosses with *Glycine soja*. Activity B is evaluating new sources of protein improvement in diverse lines of soybean originally developed to increase yield using soybean ancestral lines and other diverse lines, including crosses with *Glycine tomentella*. Activity C is evaluating a population of mutagenized soybean that has shown potential for improving soybean seed protein content.
PROPOSAL ON A PAGE

POP Name: Effect of Cultural Practices on Soybean Seed Quality
Short Name: ProtMgtUr
Proposal #: 1820-152-0108
Requested Budget: $399,785
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY

The directors requested moderately innovative proposals that evaluated past soybean production system projects to determine production practices that improved seed protein content. A study is proposed to determine the contribution of different cultural practices on soybean protein via implementation of: 1) meta-analysis of current and past scientific data changes in crude protein due to cultural practices from a wide range of field studies with broad geographic representation; and 2) multi-state research studies the best candidate practices identified to improve soybean seed protein and essential amino acids. Characterization of limitations to N uptake (both fixed N and soil N) will assist in establishing best management practices (BMPs) to improve soybean seed protein and its economic value. Increase in soybean meal protein concentration by as little as 0.5 percentage units due to adoption of best management practices that enhance seed N content can increase the value of the U.S. soybean crop by $400 million.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The success of this proposal will provide excellent direction to soybean farmers on how best to manage existing soybean varieties to improve seed protein content. This project has access to an extensive set of databases including the USB-funded “kitchen sink study” (Agronomic Maximization of Soybean Yield and Quality) that contains over 9,000 observations, a Winfield/Kansas State database related to N fertilization timing and N fixation with 1,000 observations, a Midsouth Soybean Board/Univ. of Arkansas database with 6,000 observations, an Iowa/Illinois/Indiana database related to N rate, N source and planting date with 1,000 observations, and data from the FIRST variety trails that contain 3,000 relevant observations. Findings of the meta-analysis of this extensive dataset will direct the field research proposed here. Engagement of WinField Solutions and DuPont Pioneer in this research ensures that the results of this program will be used by the industry. Knowledge of how to best manage soybean varieties that differ in N metabolism has the potential to impact the entire 90 million acre U.S. soybean market. This proposal could provide good direction for the development of variety-specific best management practices to improve seed protein content.

2: Value Impact

Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluation of varieties released from 1920 through 2010. Evaluation of protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units per year. This continual decline in protein has resulted in processors having difficulty meeting the minimum 47.5% protein content required for high-protein meal designation. In fact, last year CME proposed lowering the trade rules for high-protein meal because of the inability to meet the current standard. Increasing soybean meal protein as little as 0.5 percentage units on all soybean production would result in a $400 million value increase for the soybean industry. It would also thwart pressure from other protein sources that are threatening soybean market share due to declines in soybean seed protein. The broad evaluation of existing management data planned in this proposal to determine factors that impact seed protein appears to have the potential to provide that type of impact.

3: Execution Feasibility

The research team represented in this project is very experienced and has been supported by USB and their state checkoffs in the past with very successful results. Much of the initial research will be using widely accepted meta-analysis techniques to evaluate a huge amount of data collected through checkoff funded research. Many of the members of this research team were involved in the initial collection of the field data being evaluated. Drs. Ciampitti, Below and Purcell are all very respected scientists who are knowledgeable of soybean N metabolism and nutrition. This proposal provides an excellent opportunity to build on previously funded research and capture more value from that investment. In that regard the proposal leverages $3,341,487 in previous checkoff investment in projects that will be the source of data for the meta-analysis performed through this proposal, including the Agronomic Maximization of Soybean Yield and Quality study that was conducted from 2012 through 2014 with USB funding of $1.5 million. In addition it has the support of WinField Solutions in providing access to field research data from their Answer Plot testing network. DuPont Pioneer is also providing all data they have collected related to N limitation to protein formation for 2016-2018.

Section C: SPECIAL CONSIDERATIONS (optional)

USB Directors specifically requested that the results of the Agronomic Maximization of Soybean Yield and Quality study supported by USB be analyzed to determine whether there are management practices that could be employed to improve soybean seed protein content. This project is doing a meta-analysis of that project and four others.
Section A: PROPOSAL SUMMARY
Understanding which carbohydrate pathways can be modified to reduce seed carbohydrate content without negatively impacting plant growth is important to developing soybean lines with improved seed composition while not reducing seed yield. This proposal hypothesizes that the turnover of lipids serves as a carbon source late in seed development. The proposed research will confirm the source of carbon for carbohydrate production and identify regulated enzymatic steps that can be used as targets to enhance final lipid composition, while at the same time reducing seed carbohydrate content. The directors requested a very innovative approach and directed staff to seek proposals from new researchers. This proposal takes an entirely different approach at reducing carbohydrates and enhancing seed oil content by blocking reallocation of carbon from oil already deposited in the seed late in the seed-filling period.

Section B. EVALUATION CRITERIA

1: Strategic Importance
USB has committed to improve soybean seed protein to address the continued decline in protein that threatens demand for soybean meal. This proposal suggests a unique approach to reducing unusable carbohydrates and increasing protein and oil at the same time. If the hypothesis put forward by this proposal is proven, this approach could be applied to all of the nearly 4 billion bushels of soybean grown in the U.S. as a means of increasing the value of and demand for U.S. soybeans. If this program is successful it would halt the decline in soybean protein without impacting yield and position U.S. soybeans as the premier protein source for livestock diets. All seed companies would be interested in advancing this approach if it is proven successful. As noted below, if the ultimate value of the seed composition improvements can be realized, it would represent an increased value of $3.12/bushel, and if applied to four billion bushels the total increase in value would be $12.4 billion annually.

2: Value Impact
Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluations of varieties released from 1920 through 2010. Evaluation of the protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units in protein per year. Protein represents nearly 2/3 of the value contained in the soybean, while processors typically derived around 37% of the value obtained from soybean from the oil extracted from the seed. Long-term selection for yield has resulted in a relative increase in the carbohydrate content of soybean seed with a consequent reduction in protein content. While the seed carbohydrate has no value to the end user, the reduction in protein has resulted in an inability of processors to produce high protein meal with a minimum protein content of 47.5%. The proposed research estimates that by blocking the reallocation of carbon from oil to carbohydrate late in seed filling will result in a seed composition of 45% protein, 24% oil, 20% carbohydrates and 11% ash dry matter basis. Once the oil is extracted from seed of this composition the resulting meal would contain 59% protein (%DM), a much more valuable product that would enhance the market position of soybean. The value of soybean of this composition would increase the value of the processed soybean by an estimated $3.12 per bushel.

3: Execution Feasibility
As with all proposals in the Stage 1 Exploration Phase, this proposal is very speculative. If the hypothesis is correct, this research has the potential to completely change the makeup of soybean. The research team is highly regarded and well experienced in the techniques they are proposing to use. The proposed research should easily be able to prove whether the hypothesis is valid within the one-year timeframe proposed. There are no outside partners for this research at this time, which makes sense for an exploration stage proposal. The researchers have $98,786 in other support for this project.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

To increase soybean value for the entire value chain, selection of soybean germplasm and identification of soybean genes controlling protein synthesis and storage along with the development of markers for those genes will aid in the development of commercial soybean varieties with an improved nutritional bundle. Significantly increasing seed protein content to near 50% in SVM could increase the value of the U.S. soybean crop by $1.6 billion. This proposal focuses on improving soybean nitrogen acquisition as well as transport to pods, and into seeds with the aim of enhancing seed yield, increasing protein concentration and enriching protein composition. We aim to achieve this by generating soybean lines with elevated expression of ureide and amino acid transporters which results in a ‘Push and Pull’ system where nitrogen is pushed out of the nodulated roots and leaves by transporters in the phloem and pulled into the seeds by transporters in the seed cotyledons. The directors requested a moderate to innovative approach to the Protein + roadmap and this proposal is very innovative in that it is applying technology that has just been discovered to improving soybean. This approach has significant potential to help USB meet its LRSP goal of increasing soy protein.

Section B: EVALUATION CRITERIA

1: Strategic Importance
The goal of USB efforts related to seed protein improvement as outlined in the Protein+ roadmap. This proposal builds on recently completed research that has identified genes controlling N transport from the root nodules to the seed that increase N fixation and total N uptake and storage in soybean seed. The result is higher soybean seed yield (21-26% increase) with no loss of protein concentration. In addition these efforts have resulted in a 16% increase in total S content of seeds, indicating higher levels of the essential S amino acids. The approach proposed here, if successful, should garner significant interest from seed companies as a means of increasing soybean protein and yield, without reducing oil content. All of the nearly 90 million acres of soybeans would benefit from this sort of protein increase.

2: Value Impact
Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluation of varieties released from 1920 through 2010. Evaluation of protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units in protein per year. This continual decline in protein has resulted in processors having difficulty meeting the minimum 47.5% protein content required for high-protein meal designation. In fact, last year CME proposed lowering the trade rules for high-protein meal because of the inability to meet the current standard. Increasing soybean meal protein from 48 to 50% on all soybean production would result in a $1.6 billion value increase for the soybean industry. It would also thwart pressure from other protein sources that are threatening soybean market share due to declines in soybean seed protein.

3: Execution feasibility
The Tegeder research group discovered the impact of enhancing the expression of N transporter genes in the root and seed. They have documented significant increases in seed yield due to increased N supply. The Fritschi research team has been involved in numerous physiological studies on soybean growth and development that have been funded by USB. The approach is novel, but the hypothesis has been proven that enhancing N transport to the seed increases yield and protein. There are several potential bottlenecks that need to be addressed, such as the pathway for enhancing seed incorporation of N and S once it has been transported to the developing seed. The researchers have no additional documented support for this project, other than the prior research that has already been completed that has proven the hypothesis that enhancing N transport enhances yield and protein content.
**Section A: PROPOSAL SUMMARY**

Identification of soybean management practices that improve soybean meal protein by even 0.5% would result in a potential $400 million increase in value for the U.S. soybean industry. The directors requested moderately innovative proposals that evaluated past soybean production system projects to determine production practices that improved seed protein content. This proposal plans to conduct a meta-analysis of published studies to determine impact of management practices on seed protein content. It also proposes to use N isotope analysis to determine whether seed N is derived from fixation or soil uptake. Finally, planned field experiments with a number of soybean genotypes varying in how they derive seed N will be subjected to a variety of management treatments to identify key management practices that can enhance seed protein. Success of the proposed work would lead to recommendations to farmers on how to best manage soybean to obtain the greatest seed protein levels from existing soybean varieties by modifying management practices.

**Section B. EVALUATION CRITERIA**

1: **Strategic Importance**

The strategic relevance of this proposal aligns with the LRSP on several levels in the soy value chain:
- It will provide excellent guidance to soybean farmers on how best to manage existing soybean varieties to improve seed protein content.
- It will help seed companies address how to achieve maximum protein levels from their existing seed catalog which will help advance the soybean industry in the face of greater demand for protein without relying totally on long-term genetic solutions.
- The acquired knowledge of BMPs for varieties with different N metabolism has the potential to impact the entire 90 million acre U.S. soybean market.
- This proposal could provide good direction for the development of variety-specific best management practices to improve seed protein content.

2: **Value Impact**

Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluation of varieties released from 1920 through 2010. Evaluation of protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units in protein per year. This continual decline in protein has resulted in processors having difficulty meeting the minimum 47.5% protein content required for high-protein meal designation. In fact, last year CME proposed lowering the trade rules for high-protein meal because of the inability to meet the current standard. Increasing soybean meal protein as little as 0.5 percentage units on all U.S. soybean production would result in a $400 million value increase for the soybean industry. It would also thwart pressure from other protein sources that are threatening soybean market share due to declines in soybean seed protein. It appears that management practices that enhance N nutrition for soybean varieties differing in N metabolism could easily result in this type of seed protein increase and have the additional advantage of being able to be realized immediately.

3: **Execution Feasibility**

Dr. Locke is a new USDA-ARS scientist who is experienced in evaluating crop physiological responses to the environment. The rest of her team is well established and respected in the soybean research community. The approaches being proposed are widely accepted and proven, and the applications proposed here make sense. The project itself does have a strong regional focus, with all the work taking place in the Carolinas, but the meta-analysis of published research will address the entire soybean producing region. This research has $2,500 in support from the North Carolina Soybean Producers Association and the team has an additional $35,000 in salary support devoted to this project.

**Section C: SPECIAL CONSIDERATIONS (optional)**
The goal of the Protein + roadmap is to improve soybean protein content without negatively impacting yield or oil content. The Upper Midwest region typically produces soybean crops with lower seed protein content, although with a balance of essential amino acids. The objective of this proposal is to assess the overall viability of developing elite commercial soybean products with a 1 – 1.5% increase in seed protein while maintaining yield and agronomic traits. This increase would move soybean meal protein from 46% to 48% high protein meal, resulting in a $46.7 million increase in the value of soybeans exported from the region through the Pacific Northwest. The target region will be the Upper Midwest which will primarily include the states of North Dakota, South Dakota, Minnesota, northwestern Iowa and northeastern Nebraska. Maturities targeted are MG0 and MG1. This initial project assesses the available germplasm diversity for higher protein lines in earlier maturity lines and the ease of incorporating these lines into high yielding soybean backgrounds. If the genetic diversity allows for higher protein lines to be advanced, USB and DuPont Pioneer will assess the viability of advancing these lines into MG 0 through Early MG 2 elite breeding lines.

Seed protein content of soybean has declined at a rate of approximately 0.02 percentage units per year over the past 90 years based on quality evaluation of varieties released from 1920 through 2010. Evaluation of protein content of USDA-NASS and USSEC quality samples from 1985 through 2015 have indicated a decline of 0.04 percentage units in protein per year. This continual decline in protein has resulted in processors having difficulty meeting the minimum 47.5% protein content required for high-protein meal designation. In fact, last year CME proposed lowering the trade rules for high-protein meal because of the inability to meet the current standard. Increasing soybean meal protein from 46 to 48% on the soybean production in this region (approx. 280 million bu. in 2016, 1 billion bu total production x 28% = 280 million bu.) would result in a $46.7 million value increase for the soybean industry.

DuPont Pioneer has breeding facilities and field laboratories located throughout the Upper Midwest region. Initial crosses have been made between high protein parents and adapted high yielding RR2/Xtend varieties in MG 0 – early MG II. The resulting populations (103) were initially developed in winter nursery in Puerto Rico. Seed (F3) from approximately 3,800 plants determined to contain appropriate high protein markers are being grown in field trials during 2017 in North Dakota, South Dakota, Minnesota and Nebraska. DuPont Pioneer has all necessary analytical facilities and equipment to determine protein, amino acids and genotype of all the materials being developed. The key challenge will be the determination of whether the high protein trait continues to be expressed in adapted, high yielding germplasm grown in the Upper Midwest environment, which is the focus of this effort. This represents an excellent collaboration with DuPont Pioneer as a commercial partner. In addition to their facilities and equipment, they are committing approximately $100,000 of in-kind costs to this program.
Section A: PROPOSAL SUMMARY

Farmers constantly hear of new innovations that may hold some potential for their operation. However, many are unaware of the efforts underway to innovate not just how they farm, but also what they grow and how it is valued. USB will distribute an issue of Beyond the Bean to show and tell farmers how their checkoff is leading innovation of a different kind, creating value opportunities for soybean farmers. The issue of the magazine will tell farmers what is happening now and prime them for their role in the future to capture more value for their soybeans. USB will share updates on how soybean seed components are being improved through research, on how innovative measurement technology can capture soybean component levels and on how the checkoff is working throughout the value chain to recognize the true value of the soybean meal. The issue will paint the big picture as to how these innovations today will help shape the future of soybean meal tomorrow, better meeting customer demands and boosting profit potential.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The role of the checkoff is to maximize profit opportunities for U.S. soybean farmers. In this role the organization must look to the future, anticipating changes in end user demands and finding innovative solutions to addressing it. Nowhere is this more important than in soybean meal and across the value chain. This magazine is one piece of a broad target area effort to make improvements to soybean meal value, through better varieties, new measurement technology and a pricing system that rewards farmers for both the yield and the quality they grow and a consistent demand from end users, all translating to profit opportunities for farmers. Farmers must begin to understand and embrace the opportunity to provide more value through their soybeans to end users. It’s their role in the entire value chain shift to realize additional value capture.

2: Value Impact

For more than a decade, Beyond the Bean has been the flagship publication and a key communications vehicle for the checkoff. USB’s Producer Attitudes Surveys continue to show a correlation between those farmers who receive Beyond the Bean and those who support the checkoff. More than two-thirds of those surveyed recall receiving the magazine – a recall rate comparable to that of industry-leading, weekly publications. Through this trusted resource we’ll show how the checkoff is leading innovation for soybean farmers across the meal target area, supporting measurement technologies that provide greater transparency for farmers, innovative research in soybean composition and how the checkoff is staying ahead of end user demands. This effort will help to bring farmers along with USB’s value capture vision.

3: Execution Feasibility

Changes across the value chain to better value soybean components will not happen overnight. Throughout efforts to make changes, an important piece of the process is to ensure farmers are made aware of the possibilities of the future, like innovative seed and measurement technology to enable additional value capture opportunities. It’s feasible to continue building farmers’ knowledge and awareness of these opportunities so that they embrace the changes as they happen. Beyond the Bean is a solid tool to help with that knowledge build, as USB communications staff have produced it for more than a decade, with a well-documented process for producing the magazine to affect farmer behavior change.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Name: Farmer Push for Realizing Component Value
Short Name: CompValue
Proposal #: 1850-151-0268
Requested Budget: $569,905.50

Term: 10/01/2017-09/30/2018
TA/AT/Goal: Meal/Supply/Technology
Supporting Roadmap Name: Value of Soybean Constituents
Requested Budget: $569,905.50
Track(s): MO ☒ NU ☐ TS ☐
Stage(s): 1 ☐ 2 ☐ 3 ☒ 4 ☒

Section A: PROPOSAL SUMMARY

Soybean farmers sell bushels of soybeans, but end users buy soybean meal and oil components. This disconnect means that the customers often know more about the product they are buying than the farmers who are selling it; and this lack of transparency means farmers don’t know if their product truly meets end user needs, which can impact long-term demand. USB can help bridge this disconnect. Measurement technology exists that can provide farmers with protein and oil readings at the point of sale. At select processing locations around the country this is already happening. Other farmers receive these readings through crop quality surveys funded through the checkoff. However, the problem is few soybean farmers are able to interpret what that information means about their soybeans. To address that, we propose an education program aimed at farmers who already receive this information that connects their protein and oil levels to the value of the bean. This is a step toward helping farmers understand why implementing a value pricing system could be beneficial. On a broader level, USB will share with farmers what the checkoff is doing to address quality issues through research and how it is working with all members of the value chain to address component value capture opportunities. All of this outreach is one piece of a plan to connect with all members of the value chain to create change. Greater farmer awareness and understanding now will lay the groundwork for a constituent value system in the future.

Section B. EVALUATION CRITERIA

1: Strategic Importance

USB has a clear long-term target of changing the way soybean farmers are paid for their crop. This change will offer much-needed transparency for farmers and align the value chain to one system of selling and purchasing. Though a change in the pricing system is still a number of years away, USB must undertake work now along the value chain to begin informing all parties what such a system might look like and how each position in the value chain stands to benefit. Farmers are an integral part in this chain. But before USB begins to promote a component value system, farmers need a greater understanding of the value of their meal and oil. As they sell based on bushels, many farmers have never needed to understand component value, and are unaware of how it has factored into basis. Bringing farmers along, as well as the entire value chain, is necessary for board’s visions of shifting from payment for yield to payment for component value.

2: Value Impact

U.S. soy protein levels have been declining for more than 30 years. U.S. soybean farmers need to confront this reduction head on in order to keep up with competition and grow market share. Not addressing the issue now across the value chain could be detrimental to farmer profitability for years to come. An important first step in this process is to make sure farmers understand component value while USB works with other partners to encourage more transparency and greater measurement opportunities at first purchaser locations. Targeting farmers who already receive these measurements creates the beginnings of a movement of greater farmer understanding and awareness of the issue as a whole, priming the industry for gradual change.

3: Execution Feasibility

Changing the soybean pricing system in the U.S. from quantity only to component value too will not be a quick process. It will take several years of work across the value chain to make this happen. The checkoff has communicated to farmers since it began more than 25 years ago and has seen success in increasing awareness and action on a variety of topics. This proposal will follow a similar process that has proven to provide effective messaging for reaching U.S. soybean farmers in the past. USB has established relationships with partners included in this proposal, including the American Soybean Association and several soybean processors who have previously shown a willingness to work with USB.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Value Goal and the Value of Soybean Constituents Roadmap, with specific emphasis on the FY18 Technical Solutions Track, Stage 3 - Validation Stage – “Verify solution concepts to solve the problem by conducting experiments in the lab or in the field”. Increased transparency and broader measurement technology adoption across the value chain is critical to a successful constituent pricing system. Survey results show that less than 10% of the Elevators have NIR machines to test soybean constituents and almost none of the farmers has one. In order to drive the market for a value based pricing model, every stakeholder needs to be able to measure and know the value of soybeans. This proposal is targeting to support new portable NIR technology companies to build calibrations for soybean constituents and build an in-house database to support farmers to analyze and define the value of their products. This reporting software includes a computer based access and mobile app capabilities.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Two emerging sources are threatening the competitiveness of U.S. soybeans: international competition, and competing sources of protein feed ingredients and edible oils (i.e. synthetic amino acids, DDGS, high protein canola and other vegetable oils). If these threats are not adequately addressed, the U.S. soybean industry is at risk of losing domestic and international market share. Understanding the mechanics of the different steps in establishing a transparent constituent value system through first-hand experiences will empower USB to take a credible leadership role in promoting broad-based adoption of quality measurement. The adoption of constituent value pricing programs will require ability to measure soybean constituents by all parties. Even though this will require extra process steps and costs, it is strategically important in that it will provide information that will ultimately allow farmers to understand this value differential and empower them to start the conversation with elevators/crushers for the value of their products and to demand better quality constituents in the soybean seed they buy. Each stakeholder in the supply chain might have different machines and platforms to test the constituents of soybeans. It is important to put all this data in a common platform in order to keep traceability and common reporting.

2: Value Impact

Analysis of protein and oil data from across an area in the U.S. shows that the range in estimated processed value (EPV) per bushel of soybeans coming from a single region in a single year can vary between $0.38 to $1.53. If the composition of all U.S. soybeans was improved so the average EPV in each region increases anywhere between 20 to 80 cents per bushel (a conservative portion of the existing variance), then the total value of the U.S. crop could potentially increase between $0.9 to $3.4 billion annually. Given the value potential of increasing protein and oil, there is an opportunity to understand the underlying causes of these differences and manage to produce higher value soybeans. A critical capability to enable such strategies is to be able to measure and report the compositional value of the soybeans back to farmers. The investment into this proposal provides a “kick start” to creating an economic incentive for the entire value chain by quantitatively measuring the differences and also providing data that can be used to understand the value potential. Adopting these programs will provide feedback to farmers about the value of beans that they are producing which will enable farmers to send appropriate market signals to the seed companies that will motivate them to provide seeds with higher quality and value. In addition to these incremental value improvements, the enhanced composition soybean traits recommended by USB’s Value Task Force will require similar capabilities and protocols to facilitate their trade in the market. Raising the overall quality/value of U.S. soybeans will have a positive impact on prices and directly support enhancement of the U.S. soy advantage.

3: Execution Feasibility

Technical challenges are minimal as the measurement and analytical processes are not new, they just have not been applied as broadly as needed. The main market challenge of this effort is that the short-term incremental gains from improving quality/value are relatively small, so there are not sizeable incremental margins available to drive broad and rapid change. However, solid data coupled with effective messaging campaigns have promise in changing attitudes towards creation of component value system that will support preference of US Soy domestically and internationally.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

The Value goal in USB’s Long-Range Strategic Plan calls for elevator managers and relevant staff to understand soybean components and their relative value. This base understanding is critical before USB can advance measurement technology adoption and component value capture opportunities with elevators. However, elevators currently measure and pay based on yield, and are not thinking about soybean components or any additional value of the U.S. Soy Advantage. To change this, the checkoff needs to educate elevator managers about soybean components and the potential to capture more value. This proposal leverages QSSB partners and their existing relationships with elevators to deliver component value messaging to elevators through one-on-one visits, group meetings and industry events. Through this elevator education effort, USB lays the foundation to increase value capture opportunities for farmers and the whole value chain.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Helping elevators understand soybean component value is an imperative first phase in propelling USB’s value capture vision forward. Elevator understanding of component value must precede the push for adoption of measurement technology and segregation/identity preservation infrastructure. To build elevator knowledge, USB will partner with QSSBs because of their existing grassroots relationships with first purchasers. Every link in the value chain, including elevators, must work together to realize additional value capture opportunities.

2: Value Impact

To move to a system where farmers are paid on yield and soybean meal and oil quality, USB must start communicating to the value chain to encourage transparency for the benefit of the entire U.S. soybean industry. Beginning to build base elevator knowledge helps to advance USB’s value capture vision for a pricing system based on delivering better products. This benefits everyone from the soybean farmer to the end user.

3: Execution Feasibility

Increasing elevators’ understanding of soybean components is feasible, especially with the support of QSSBs. QSSB feedback, opinions and needs are incorporated into the proposal to ensure execution feasibility.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
Section A: PROPOSAL SUMMARY

Over the last few decades, soybean yield has been positioned as the central focus in the value chain. As a result, compositional quality of U.S. soy has steadily eroded, putting us at a disadvantage with the global competition. One way the checkoff is addressing this challenge is through exploration of a value capture system where all links in the chain can benefit. Crushers and others in the middle of the chain don’t fully understand USB’s vision and USB’s investment across the value chain to move towards improved value capture. To solve this, and to help build consensus and partnership for value capture opportunities, we propose a Marketplace version of Beyond the Bean magazine designed specifically for this mid-value chain audience. The magazine will drive the value proposition concept directly to those who can impact change. As a result, we will continue to gain buy-in from our value chain partners to drive adoption of a value capture system.

Section B. EVALUATION CRITERIA

1: Strategic Importance

 Crushers are considered one the closest links to the farmer in the soybean value chain, but in reality they are very disconnected from the checkoff and its vision to develop a value capture system, resulting in more transparency and better U.S. soybean quality. This plan calls for a publication specifically created for, and distributed to, crushers and their affiliated elevators to introduce them to USB’s vision for the future of the soybean industry. We cannot implement a system where soybeans are valued based on compositional qualities without buy-in from the crushers, so we need to start communicating with them now on a broad scale about the benefits of such a system.

2: Value Impact

Without buy-in from the crushers and their network of elevators, a value capture system will not be successful. But before we tell them they need to change from a volume-based system to a system that values composition, they need to know why such a system is needed. This proposal is the only large-scale, direct communications effort targeting every domestic crusher and affiliated elevator about the checkoff’s vision for a value capture system in which the entire industry can benefit.

3: Execution Feasibility

Currently no one else is communicating with all domestic crushers and their affiliated elevators in coordinated or consistent way about the checkoff’s vision for a value capture system. A publication of this significance will deploy USB’s messages about improving soybean value, meeting end-user demand, and ultimately, paint the entire picture for the much-needed system improvements. Authentic content for the magazine will be solicited from the marketplace. We have proven success for creating custom publications, and have multiple database sources to obtain the appropriate contact list.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
PROPOSAL ON A PAGE

POP Name: Advancing the U.S. Soy Advantage Through the Value Chain to Buyers
Short Name: FD-MO-D12-
Proposal #: 1810-253-0436
Link to full proposal: [Link to full proposal]
Requested Budget: $3,753,510
Last Gate Score, if applicable: [Score]

Section A: PROPOSAL SUMMARY

Many feedmill buyers do not fully understand how to value of U.S. soybean meal’s nutritional bundle and instead, buy mainly on price. In addition, key positions within this target audience change with company promotions and transfers. Therefore while primary audiences is identified, we will work closely with the appropriate management to help ensure that actual buyers are present if the venue allows. Buyers are addressed in other programs, and nutrition specialist have some influence over buyers if an integrated operation.

Proposed efforts include a mix of regional efforts of the Americas, North Asia, EU-MENA, Southeast Asia and World Wide to include technical seminars (e.g. U.S. Soy Advantage Buyers Conferences in key markets – China, Taiwan, Korea and Japan), trade teams (e.g. attendance at the International Production & Processing Expo), conferences (e.g. Ag Leadership Summit, U.S. Soy Advantage Buyers Conferences, Grain Transportation Conferences, Importer and End-User procedures), and sponsorships of producer associations. Most importantly, this proposal includes key program implementation contractors that have worked in-country on behalf of the U.S. soy industry for many years and have developed strong relationship with key customers. Combined, the long-term contractors and the superior value of U.S. soy create a package that continues adding value to U.S. soy producers. This proposal fulfills the request of directors for proposals that showcase the nutritional bundle and that educate buyers on the U.S. soy advantage. This proposal is not interdependent with any other proposal, but it does link directly and supports work proposed in the Demand Action Team as part of proposal #1810-353-0534. NOTE: Regional efforts are as follows: America’s - $425,839; North Asia - $1,079,911; EU-MENA – $1,065,510; Southeast Asia - $1,076,301 and World Wide - $105,949

Section B. EVALUATION CRITERIA

1: Strategic Importance
With 98 percent of U.S. soybean meal going to animal agriculture, this sector is the single largest customer for the U.S. soy industry (Source: Soyatech. [http://www.soyatech.com/soy_facts.htm]). The sector is expected to continue growing significantly as meat demand increases particularly in developing countries. This proposal will allow USB to interact directly with key customers to further position U.S. soy as the preferred protein source. The global customer survey conducted in the spring of 2017 revealed that only 57 percent of surveyed customers agreed that meal made with U.S. soybeans is better in feed formulations and 59 percent said that they prefer feed meal with meal from U.S. soybeans because the feed nutrient components produce better results. While this may seem significant, a very large percentage of buyers still lack the knowledge necessary to take decisions (sometimes despite significant price difference) to purchase U.S. soy. Importantly, this proposal also funds key field staff personnel who will interact directly with key target audiences, thus having a greater ability to reach the objective. This proposal primarily seeks to address Marketplace-Meal goal Objective D (buyers will be aware of the latest developments and technology releases of new and improved soy products and will make purchase decisions based on the U.S. soy advantage).

2: Value Impact
Animal agriculture is the number one customer of U.S. soy and this proposal reaches these customers globally, focusing both on those target audiences where awareness of U.S. soy attributes and preference is lower and on current customer that might explore other options. This proposal provides the U.S. soy industry with critical marketing support personnel that not only work in association with technical experts that are proposed under the Demand Action Team, but also who have direct interaction with U.S. soy customers. Their work and the activities they support are designed to differentiate U.S. soy from these other sources and to highlight and demonstrate core advantages. Therefore, this proposal does have the potential to advance constituent pricing. If successful, it is anticipated that 75 percent of the targeted international poultry and swine producers surveyed will say they prefer feed made from U.S. soybeans because of the better feed nutrient components (up from 59 percent in spring 2017). Importantly, results in FY18 should provide insights for the Action Team to confirm 2021 milestones for the associated objectives.

3: Execution Feasibility
It is anticipated that USB’s investment in this proposal will leverage an additional $3.2 million from USDA/FAS ($3,196,572) and QSSB funds ($10,000). We do not anticipate significant challenges with executing the activities covered by this proposal. For those audiences that are not being reached directly, a significant effort is made to partner with key producer associations within each key market. These associations can carry key messages to their producer members, greatly extending USB’s reach. Market access challenges can and do arise that require constant vigilance. The customer interaction that this proposal affords allows USB to remain extremely close to each market, helping to mitigate market access issues that might arise. The actual work to address such issues is covered under the Market Access Program in the Sustainability Roadmap.

Section C: SPECIAL CONSIDERATIONS (optional)
**Section A: PROPOSAL SUMMARY**

It is essential for all segments of the value chain to understand the composition of the U.S. soybean crop in order to facilitate trading based on the value of the crop to end users. This is a key component of the Value goal in the Marketplace Action Team of USB. This proposal provides quality analysis of the U.S. Department of Agriculture National Agriculture Statistics Service (USDA-NASS) Objective Yield (OY) samples to reflect the environmental impact on soybean quality during the production year (Activity A), which is useful for traders on a regional basis and also serves as a source of information on the variability of the current crop. The USDA-NASS OY samples represent the most statistically representative set of data regarding the U.S. soybean crop. The other study represented here (Activity B) provides amino acid analysis of the samples from the FIRST variety trials that gives a clear picture of the impact of environment and genetic background on amino acid composition of soybean varieties in a given geographic region, information that is very useful to end users. This is a more conservative proposal as it provides standard information regarding the U.S. soybean crop, but this information is critical to direct the soybean trade.

**Section B: EVALUATION CRITERIA**

1: **Strategic Importance**

An adequate understanding of the composition of the U.S. soybean crop is essential to marketing the crop both domestically and internationally. The information provided by this program is critical to the entire value chain as they make purchasing plans for soybeans based on the composition of the soybean crop. This engagement of the entire value chain strengthens USB’s position as a major supplier of key market information and enhances relationships with the entire value chain. This study impacts the marketing of the entire 4.3-billion-bushel soybean crop.

2: **Value Impact**

There is significant variability in the composition of the U.S. soybean crop from year-to-year and based on geographic differences due to environmental and climatic variation. Accurate representation of the geographic variation in soybean composition within a given year can be very useful to buyers and processors as they source soybean to meet their needs. Knowledge of regional variation in composition and varietal differences in amino acid composition can help drive purchase decisions and result in more value for the crop through the entire value chain. Processors can selectively source soybean to meet the needs of specific customers based on nutritional needs of specific livestock classes. This knowledge supports the ability to capture the most value for the crop and provides end users with information that allows them to source the most economical soybeans to meet their specific needs. An example, if gestating sows nutritional needs can be met with a ration based on 46% protein soybean mean priced at $307/ton and growing pigs require 48% protein mean priced at $320/ton, the livestock feeder can source lower protein SBM for sows at a discount and source high protein soybean meal for animals with higher nutritional requirements, taking advantage of the price difference to lower their costs. This example shows how a constituent pricing system could work to the advantage of the entire value chain by purchasing on the basis of nutritional content, instead of paying a flat commodity price. Total value of savings would relate to the tonnage of each feed required. This same logic applies to the amino acid requirements of different livestock classes.

3: **Execution Feasibility**

This program has been developed for many years. It provides the best representation of the quality of the U.S. soybean crop because of the sampling protocol of USDA-NASS. This program has developed a unique working relationship between USB and USDA-NASS that has improved the utility of the OY program. The key constraint to this program is the bureaucratic slowness of getting the samples delivered for analysis, which reduces some of the potential utility of the samples due to the untimely analysis of soybean composition. Dr. Bajjalieh has conducted this program from its inception and he has developed a unique relationship with USDA-NASS that has resulted in the availability of the samples for composition analysis.

**Section C: SPECIAL CONSIDERATIONS (optional)**
Section A: PROPOSAL SUMMARY

A critical part of the Value of Soybean Constituents roadmap is the technical solutions track that aims to develop measurement technologies that allow the entire value chain to define and understand the factors that make up the value of soybeans. Commodity pricing fails to transparently communicate the factors that make up soybean value. For instance, a 1 percentage unit increase in protein on 10% of the soybean acreage would mean a $93 million increased earnings potential for the respective parts of the value chain. Increased transparency and broader measurement technology adoption across the value chain is critical to a successful constituent pricing system. Inconsistent measurements have been a major roadblock to constituent pricing. This proposal will use historical data from 2000 – 2016 to determine the practical impact of protein and oil measurement inconsistency on trade and genetic selection. Cost effective protocols will be developed to achieve measurement consistency and a more complete understanding of component variation (genetics, region, year). There will be an economic assessment, based on the new USB-sponsored Estimated Processed Value (EPV) model, including consequences of measurement error and component variations. The directors requested a high degree of innovativeness with regard to the measurement piece of the Value roadmap. This proposal fits those criteria.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Past USB attempts to standardize laboratories and evaluate sample analysis consistency have identified key issues that impact analysis accuracy. The major goal of the Value of Soybean Constituents roadmap is to develop technologies that can accurately determine soybean value at all points in the value chain. This is impossible if there are significant measurement inconsistencies throughout the chain. This proposal plans to evaluate the economic impact of measurement inaccuracies as a means of engaging groups who are conducting measurements to improve measurement accuracy. The proposed work will develop measurement protocols that minimize inaccuracies and maximize consistency. Ultimately a quality control system will be developed that minimizes measurement errors from multiple sources so that value decisions can be made more accurately. The development of this system will require engagement with the entire value chain which will enhance USB’s relationship with the value chain.

2: Value Impact

The research proposed here offers significant potential to support the effective development of soybean constituent pricing. There is no way to value constituents that can’t be measured consistently throughout the value chain. Although the current commodity pricing system takes into account the relationship between supply and demand, there is little open consideration of the value represented by the products provided by soybean. As an example, if soybean varieties were developed that increased protein by 1 percentage unit, the estimated processed value of soybean would increase by between $7.70 and $12.96/acre. This average increase of $10.33 per acre would amount to $93 million, if only 10% of the soybean acreage was planted of the improved variety. If currently available measurement technologies were to underestimate protein at any point in the value chain by 1%, it would result in a $0.93 million loss of value in this example. The goal of this proposal is to address that type of measurement inconsistency.

3: Execution Feasibility

This proposal builds on past USB-funded research that identified key sources of measurement error and also utilizes the currently funded new Soy PROCessing (SPROC) equation to calculate constituent value of soybean samples. This research team is completing that effort. The real challenge with this proposal is to get the members of the value chain to adopt the protocol that is developed as a result of this effort. The proposed work will show the cost of measurement variability and provide direction for how to reduce variability, but the potential roadblock is whether members of the value chain will adopt this protocol. This research team was engaged by the U.S. Department of Agriculture Grain Inspection Packers and Stockyards Administration (USDA-GIPSA) in 2014 to evaluate whether multiple NIR platforms could be used in official measurements for trade. This Equivalence Study is now in its field testing stage, but it had 10x less measurement variability than the earlier Soybean Quality Traits study conducted by the American Oil Chemists Society (AOCS), indicating that there is potential to improve against measurement variability.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Marketplace-Meal-Value Roadmap which reads “Defend U.S. soy market outreach through segmented approach with a focus on current soybean meal advantages...” There is also a milestone that refers to crushers improving accuracy, standardizing NIR measurement and beginning early adoption of component pricing. This POP will provide crushers a better understanding of competition to soybean meal (SBM) in the domestic feed marketplace so they adopt component pricing. This POP is also key to assisting in expansion of the domestic feed market value increasing 14% from $10.7 billion in FY15/16 (USDA) to $12.2 billion by FY20/21.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This POP will provide crushers a better understanding of competition to SBM in the domestic feed marketplace so they adopt component pricing as specified in USB’s LRSP.
- The proposal will strengthen USB’s relationships with crushers by helping them better understand how the value bundle of U.S. SBM can be improved in relation to competing ingredients.
- By engaging crushers, this proposal advances relevant, strategic partnerships some of our largest domestic customers—like ADM, Bunge and CHS—in a 33.1-million-ton market (USDA), the equivalent of 1.40 billion bushels.
- Over the past few years, crushers have become more open to exploring new opportunities. They are more aware than ever that SBM has deep-pocketed competition backed by a wealth of peer-reviewed science. Although, market volume has grown 14.3% from FY12/13 to FY15/16 and is forecast to grow 8.5% by FY20/21 (USDA), crushers are starting to take the competition seriously.
- This proposal will build on quality relationships with one of USB’s largest customer segments, opening new windows of opportunity for constituent/component pricing and new partnerships to advance trait-enhanced soybeans.

2: Value Impact

This proposal will provide the tools that allow the domestic Demand-Meal-Meal area to create an additional $1.5 billion in value for the U.S. soy industry, based on estimates from USDA. It will achieve this objective by providing the research that educates crushers on their domestic feed competition, allowing them to make adjustments that help them compete more effectively.
- This proposal improves grower profitability by increasing demand.
- This proposal has potential to advance constituent pricing.
- Cost of the proposal is $203,595 as compared to the FY15/16 value of the domestic SBM market at $10.7 billion (USDA). Market value is forecast to increase 14% to $12.2 billion by FY20/21 (USDA).
- This proposal will drive adoption of component pricing by directly engaging the largest buyers in our single largest market.
- The final solution will increase the competitive position of SBM, boosting profit and enabling further expansion.

3: Execution Feasibility

Continued strong efforts are needed to make crushers aware of the technical challenges in this area, which are related to continued advancement by alternative ingredients providers, especially synthetic amino acids suppliers and new improved canola varieties. Over the past few years, we have found that the domestic Demand-Meal-Meal team’s uniquely close interaction with influential animal nutritionists has provided USB with important allies, who not only purchase a lot of SBM but whose actions influence their peers. A similar type of relationship must be extended to crushers and this information is a good start.
- Subcontractors have successfully executed in the past and there is no reason to expect otherwise this year.
This proposal aims to contribute to the development of soybean constituent pricing by developing a new measurement technology that has the potential to be more accurate and less expensive than the current NIR technology standard. There is no way to value constituents that can’t be measured, and measurements are useless if they are not consistent throughout the value chain. Although the current commodity pricing system takes into account the relationship between supply and demand, there is little overt consideration of the value represented by the products provided by soybean. As an example, if soybean varieties were developed that increased protein by 1 percentage unit, the estimated processed value of soybean would increase by between $7.70 and $12.96/acre. This average increase of $10.33 per acre would amount to $93 million to the soy industry, if only 10% of the soybean acreage was planted to the improved variety. Without measurement technologies in place capable of measuring the actual differences, this value would be lost within the system and there would be no incentive for grower adoption of the new varieties.

Any new technology must cross the hurdle of validation and then gain industry acceptance. Previously conducted USB-funded research has proven Raman spectroscopy is not only chemically specific, but has the potential to offer greater prediction capabilities than NIR for soybean analyses. In past research, this research team has effectively proven the ability of Raman spectroscopy to predict the composition of key soybean constituents in bulk and in individual seed samples. The current proposal seeks to develop a miniaturized platform that would allow on-site evaluation of soybean constituents. If the concept is proven, the key challenge will be to engage technology companies to develop the technology into a commercially available platform at a reasonable enough cost for farmers and elevators to accept, deploy and adopt the technology for constituent value analysis.
Section A: PROPOSAL SUMMARY

A critical part of the Value of Soybean Constituents roadmap is the technical solutions track that aims to develop measurement technologies that allow the entire value chain to define and understand the factors that make up the value of soybeans. Commodity pricing fails to transparently communicate the factors that make up soybean value. For instance, a 1 percentage unit increase in protein on 10% of the soybean acreage would mean a $93 million value increase to the soybean industry that could be spread across the value chain if measurement technology was in place to indicate that value at each point in the chain. The development of a network of near infrared (NIR) measurement platforms and continuous integration of standardized calibrations are essential for the use in commercial decision-making. This proposal addresses these needs by integrating tools owned by other entities to demonstrate the feasibility of an integrated network measurement system. It will also integrate key constituent values into a single meaningful number that can be used to differentiate lots of soybeans. The proposed work continues NIR performance evaluation and technical support activities related to the development of a Constituent Market System. The directors requested a high degree of innovativeness with regard to the measurement piece of the Value roadmap. This proposal fits those criteria.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Commodity pricing for soybeans does not provide transparency throughout the value chain to indicate what makes up the value of soybean. Commodity prices typically reflect supply and demand functions, with basis at a location often reflecting regional differences in quality in addition to transportation costs. By its nature, engagement of the entire value chain in a conversation about measuring soybean value and making that measurement transparent will improve relationships throughout the value chain. Ultimately, the development of a constituent pricing system will allow the entire value chain to capture more of the full value of the soybean crop. Discussion of measurement systems and soybean value constituents provides a means to open new conversations throughout the value chain that increase transparency.

2: Value Impact

This proposal is essential to the effective development of soybean constituent pricing. There is no way to value constituents that can’t be measured, and measurements are useless if they are not consistent throughout the values chain. It is also critical to have measurement values that can be easily understood and communicated throughout the value chain. Although the current commodity pricing system takes into account the relationship between supply and demand, there is little overt consideration of the value represented by the products provided by soybeans. As an example, if soybean varieties were developed that increased protein by 1 percentage unit, the estimated processed value of soybean would increase by between $7.70 and $12.96/acre. This average increase of $10.33 per acre would amount to approx. $93 million across the value chain, if only 10% of the soybean acreage was planted of the improved variety. Without measurement technologies in place capable of measuring that improved value, this value would be lost within the system.

3: Execution Feasibility

Engagement of the entire value chain is the greatest barrier to success of this program. Addition of NIR technology at elevators and other points in the value chain represents a significant expense that must be rationalized against the value that it can help realize. In addition, the ability to calibrate a network of NIR platforms across the value chain so that values are consistent, is a critical challenge that represents one of the key objectives of this proposal. This proposal engages with multiple NIR technology providers and end users to coordinate the development of these measurement criteria.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

One key barrier to boosting soybean meal inclusion rates is that buyers and animal nutritionists are motivated by different factors. Specifically, buyers focus on price, while health and rate of gain is important to nutritionists. These differing motivators create a disconnect between soybean meal and its value. That’s a serious hurdle for increasing soybean meal use in feed rations. This proposal will work to bridge the gap between the buyers and animal nutritionists within companies to help pave the way for increased rations, and, longer term, compensation for increased value. We will use in-person discussions to provide insight into their businesses and develop plans to overcome challenges in the marketplace. We’ll also continue to develop marketing materials that will help sell U.S. soy to buyers and animal nutritionists.

Section B: EVALUATION CRITERIA

1: Strategic Importance

This audience is crucial for the soy checkoff. If the end game is to increase soybean meal inclusion rates, then the checkoff must spend time targeting buyers and adding soy’s value as part of the conversation. Buyers are the ones ultimately making the purchasing decisions. This proposal addresses soybean meal as it is today, but also opens the line of communication to discuss meal improvements down the road. For the value conversation to really take off, we must have someone on the demand side of the value chain pulling for change. This is a foot in the door strategy to begin that demand pull.

2: Value Impact

The U.S. poultry and swine industries represents 24.23 million metric tons of demand each year. In order to maintain and grow U.S. soy’s largest meal market long-term, we need animal feed buyers to recognize the intrinsic value of soybean meal. This proposal will directly contribute to buyers’ understanding of soybean meal’s benefits. And, with research elements included, the proposal will contribute to USB’s knowledge of buyers, their pain points and potential roadblocks to pulling through value-enhanced meal products. By effectively reaching buyers with the advantages of U.S. soybean meal, USB has the opportunity to increase preference and inclusion rates in animal diets.

3: Execution Feasibility

While influential, the main target audience for this proposal – buyers – is small. Reaching people from this limited group to engage in direct conversations could prove to be challenging based on their availability and willingness to communicate. We anticipate that our existing relationships with animal nutritionists from the Animal Nutrition Working Group (ANWG) will help open doors for us. Members of ANWG work at the same companies as the buyers we are targeting. Knowing that we are helping their cause by promoting the value of soybean meal, they will likely be essential as we reach out to buyers at their organizations.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

The competitiveness of U.S. soybean meal is challenged by foreign suppliers of soy as well as competing feedstocks. The needs of international animal nutritionists can be very specialized and influenced by regional feedstock preferences. Domestically, the checkoff has successfully engaged animal nutritionists to 1) share information with them about U.S. soybean meal and; 2) gain insights to help determine where product improvements are needed. By creating a pilot to replicate this partnership approach with international audiences, this proposal builds on that momentum and is a piece of that effort. Specifically, it helps to bring the key insights from the domestic market to international markets and provides communications strategy and implementation for these efforts. With implementation of this pilot, farmers stand to gain stronger relationships with and a mechanism for open dialogue among animal nutritionists in Europe and Southeast Asia. This proposal is interdependent with the following proposals: Animal Nutrition Working Group Regional Feasibility Pilot – WW Collaboration and Animal Nutrition Working Group Regional Feasibility Pilot – Domestic Collaboration.

Section B. EVALUATION CRITERIA

1: Strategic Importance

For the checkoff to get animal producers to seek more meal made from U.S. soybeans, the organization must first build strong relationships with those audiences that make the most impact. By working with animal nutritionists on the international level, we can replicate domestic successes and ultimately start a dialogue between soybean farmers and animal nutritionists. While animal nutritionists are not a large audience, they are an influential one. As a pilot, this proposal targets a subset of animal nutritionists to gain key insights about their challenges and what opportunities U.S. soy has to help them overcome those challenges. This proposal also opens dialogue for future conversations about the commitment U.S. soy has to continuous improvement in both meal quality and sustainability – setting the stage for the value pull-through conversation to advance constituent pricing.

2: Value Impact

This proposal, followed by continued dialogue, has the opportunity to increase inclusion rates of U.S. soy in international feed rations. It will achieve this objective by engaging animal nutritionists to remind them of the multiple advantages of U.S. soy products. Europe and Southeast Asia are markets that have room for growth for U.S. soy, and this proposal aims to create an additional $158 million in value for the U.S. soy industry in those countries, based on estimates from USSEC. If the customers understand the advantages U.S. soy brings now and the improvements in the pipeline, they will be more likely to include more U.S. soy than they have previously and ultimately raise demand. This particular effort will help set U.S. soy apart from competitors in the global marketplace and continue selling U.S. soy on its advantages and the commitment to the future.

3: Execution Feasibility

Every region throughout the country has its own set of unique challenges when it comes to livestock feed. This proposal will help identify those specific challenges and help to overcome them through communications strategy. This proposal will work to help position U.S. soy by creating a useful, meaningful conversation for targeted participants. The plan is to leverage domestic experience to help develop positioning messages and materials and elevate interest for these events. By having a follow-up planned to discuss the results of the meeting, U.S. soy can maintain the relationship formed during these meetings and set up success for future conversations.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Names: Advancing the U.S. Soy Advantage for Poultry & Livestock to End Users
Short Name: FD-MO-D16
Proposal #: 1810-353-0534
Link to full proposal: 
Requested Budget: $2,147,492
Last Gate Score, if applicable: $2,147,492

Section A: PROPOSAL SUMMARY

U.S. soy has a superior amino-acid profile, enhanced digestibility in many animals, and better energy performance when compared to soybean meal from other origins. However, competing products continue to arise and improve including high protein, low fiber canola meal, synthetic amino acids and of course, soybean meal from other origins, sometimes available at a lower price. Many buyers, animal nutritionists and primarily end users do not fully understand the value of U.S. soybean meal’s nutritional bundle and instead, may buy strictly on price. In addition, there is considerable turn-over in the industry within this target audience. Therefore, this proposal targets these audiences to educate them about the advantages of using animal feed made with U.S. soy. Proposed efforts include a mix of technical seminars, trade teams, conferences, and sponsorships of producer associations in key markets in the Americas, North Asia, S.E. Asia, Europe, the Middle East, and the Asia Sub Continent. Long term contractors funded in this proposal are evaluated on an annual basis against performance. This proposal aligns with USB Director requests for experienced contractors to execute a mix of activities mostly defending the core targeting the poultry and swine sector. This proposal is not interdependent with any other proposal. However, funding to maintain field teams around the world is being sought as part of proposal #1810-253-0436.

Section B: EVALUATION CRITERIA

1: Strategic Importance

With 98 percent of U.S. soybean meal going to animal agriculture, this sector is the single largest customer for the U.S. soy industry (Source: Soyatech. [http://www.soyatech.com/soy_facts.htm]). The sector is expected to continue growing significantly as meat demand increases particularly in developing countries. USB, through the activities in this proposal will position U.S. soy as the preferred protein source for the target audiences. The global customer survey conducted in the spring of 2017 revealed that only 57 percent of surveyed customers agreed that meal made with U.S. soybeans is better in feed formulations and 59 percent said that they prefer feed made with meal from U.S. soybeans because the feed nutrient components produce better results. Through this proposal, USB is working to reach those audiences were there is an opportunity to boost awareness and preference for U.S. soy to increase awareness providing key decision makers with the tools needed to take informed decisions. USB is also focused on maintaining market share among those currently purchasing U.S. soy. It is important to keep in mind that even among those with a strong preference for U.S. soy, the demographics inside the companies and target audience change, thus making it essential to have a continued presence. This proposal primarily seeks to address Objective D (End Users will seek out feed made with U.S. soy because of its consistency, superior amino-acid profile, and uniformity.) But, other objectives will also be impacted including A, B, and C. With USB’s global reach, seasoned professionals are deployed into the field who interact directly with key target audiences, thus improving the chances of reaching the objectives. Their work and the associated activities are designed to differentiate U.S. soy from these other sources and to highlight and demonstrate core advantages. For those audiences that not being reached directly, a significant effort is made to partner with influential value chain associations within each key market. These associations can carry key messages to their members, greatly extending USB’s reach.

2: Value Impact

Animal agriculture is the number one customer of U.S. soy and this proposal reaches these customers globally, focusing both on those target audiences where awareness of U.S. soy attributes and preference is lower and on current customer that might explore other options. Furthermore, because this proposal focuses on building demand at the end of the value chain, all efforts in the meal target area focused on protein improvements, constituent pricing etc. culminate in this proposal, making it critical to success in achieving USB’s goals in the meal target area. If successful, it is anticipated that 75 percent of the targeted international poultry and swine producers surveyed will say they prefer feed made from U.S. soybeans because of the better feed nutrient components (up from 59 percent in spring 2017). Importantly, results in FY18 should provide insights for the Action Team to confirm 2021 milestones for the associated objectives.

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $2.79 million from USDA/FAS ($2,688,007) and QSSB funds ($103,000). Major challenges with executing the activities covered by this proposal are not anticipated. However, competition in the international market place is stiff and price can dominate the discussion if decision makers are not equipped with the right tools and understanding of the additional intrinsic and extrinsic values of U.S. soy as outlined in the U.S. Soy advantage. This reality makes it even more important for USB’s efforts to continue, making sure the right decision makers are well informed at the right time. In addition, market access challenges can and do arise that require constant vigilance. The customer interaction that this proposal affords allows USSEC to remain extremely close to each market, helping to mitigate market access issues that might arise. The actual work to address such issues is covered under the Market Access Program in the Sustainability Roadmap.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Aquaculture Roadmap with specific focus on the New Utilization chevron which reads “develop and demonstrate advantage of increased inclusion of U.S. soybean meal (SBM) in aquafeeds.” The Directors requested a level of innovativeness to support new volume through the value chain with existing products. If the innovative approaches in this POP are successful, estimated market impact will be over 100,000 tons, approximately $32.5 million the first year. A total of $150,000 in collaborative funds have been committed.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The proposal will increase U.S. soybean meal (SBM) inclusion rates in aquaculture feed rations due to recognition of its superior constituent/component value as specified in USB’s LRSP. The proposed research would address Grouper, Seriola, Shrimp, Seabass, Snakehead, Trout and Red Drum. Areas of the world impacted would include Asia, South America, ASEAN, Oceania, the European Union and the U.S. all of which are projected to offer 1.6 million tons of SBM growth by 2021. These species are large industries currently underutilizing or consuming little or no SBM or SPC.

- The proposal will strengthen USB’s relationships with aquaculture nutritionists by allowing them to displace high priced fish meal with lower priced SBM and soy protein concentrate (SPC).
- The proposal advances relevant, strategic partnerships with a fast growing segment that is challenged by limited global fish meal supplies and as a result has a significant interest in increased use of alternative protein sources.
- Current estimated U.S. SBM use in aquaculture diets globally is about 5.5 million tons (Global Aquaculture Alliance).
- New volume generated from this POP would be about 100,000 tons the first year with a value of about $32.5 million.
- This proposal opens a new window of opportunity for SBM gaining wider recognition as a product that can be included at relatively high levels in a variety of aquaculture diets.

2: Value Impact

This proposal will further grow the 5.5 MT ($1.8 billion) market for U.S. soy global aquaculture by demonstrating that soy products can be included at levels higher than typically used. If proven, potential volume increase from this research could be an additional 1.6 million tons of soybean meal and protein concentrated (the equivalent of 67.9 million bushels) conservatively valued at $545.6 million (USDA).

- It has the potential to significantly increase the customers’ demand for constituent pricing.
- Cost of the proposal is $987,537 and potential first year benefit is $32.5 million.
- This proposal will drive further adoption of U.S. soy products by showing they can be effectively included in aquaculture diets in countries and species which have the potential for significant growth by 2021.
- The end user benefit is that aquaculture producers will be able to realize cost-efficiencies while increasing soy product use.

3: Execution Feasibility

The biggest challenge is that when working with biological systems, complicating factors such as disease or environmental factors can disrupt the trials. In the past, these factors have rarely complicated trials so we anticipate this risk as low.

- We anticipate market acceptance of these findings being high and that implementation and adoption challenges will be low.
- A total of $150,000 in collaborative funds have been committed by one company, one university and two governmental bodies. If approved, financial commitment will be sought from QSSBs.
- Partners are among the most respected aquaculture nutrition researchers in the world.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Feed Demand-Livestock and Poultry Roadmap with specific focus on the Market Outreach chevron which reads “Defending U.S. soy market share through segmented outreach approach with a focus on current soybean meal (SBM) advantages, nutritional bundle research and gathering end-user needs.” The Directors requested outreach to existing customers with existing products. Successful completion of this proposal will result in market value increasing 14% from $10.7 billion in FY15/16 (USDA) to $12.2 billion by FY20/21.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This proposal will increase U.S. soybean meal (SBM) inclusion rates in feed rations due to recognition of its superior constituent/component value as specified in USB’s LRSP.
- The proposal will strengthen USB’s relationships with animal nutritionists by helping them better understand how the value bundle of U.S. SBM offers advantages over competing ingredients.
- By engaging animal nutritionists, this proposal advances relevant, strategic partnerships with the largest customers—like Tyson Foods, JBS-Pilgrim’s and The Maschhoff’s— in a 33.1-million-ton market (USDA), the equivalent of 1.40 billion bushels.
- The market is very interested in getting more value from SBM. SBM inclusion rates have risen in broiler grower diets 4 of the last 5 years and SBM has been over 25 percent of both hen and tom turkey diets for the past three years in a row (Agri Stats). Animal nutrition industry accounts for 97% of domestic soybean meal consumption (Market View Database). Market volume has grown 14.3% from FY12/13 to FY15/16 and is forecast to grow 8.5 % by FY20/21 (USDA).
- This proposal builds on quality relationships with USB’s largest customer opening new windows of opportunity for constituent/component pricing and new partnerships to advance trait-enhanced soybeans.

2: Value Impact

This proposal aims to create an additional $1.5 billion in value for the U.S. soy industry, based on estimates from USDA. It will achieve this objective by engaging animal nutritionists to remind them of the handling, availability, consistency and balanced amino acid profile advantages of SBM and introduce new research to advance SBM in terms of supporting animal health.
- This proposal improves grower profitability by increasing demand.
- This proposal has potential to advance constituent pricing.
- Cost of the proposal is $721,299 as compared to the FY15/16 value of the domestic SBM market at $10.7 billion (USDA). Market value is forecast to increase 14% to $12.2 billion by FY20/21 (USDA).
- This proposal will drive adoption of US soy market offerings by directly engaging the largest buyers in our single largest market.
- The final solution will increase the growth efficiency of the end users’ animals, boosting his profit and enabling further expansion.

3: Execution Feasibility

Continued strong efforts are needed to address the clearest technical challenges in this area, which are related to continued advancement by alternative ingredients providers, especially synthetic amino acids suppliers and new improved canola varieties. Over the past few years, we have found that our uniquely close interaction with influential animal nutritionists has provided USB with influential allies, who not only purchase a lot of SBM but whose actions influence their peers.
- Other challenges can include market shocks like anti-dumping duties on DDGS or potential bans related to concerns over foreign animal disease transfer.
- Financial commitment will be pursued from QSSBs and AFIA members.
- Team has successfully executed in the past and there is no reason to expect otherwise this year.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Feed Demand-Livestock and Poultry Roadmap with specific focus on the New Utilization chevron which reads “Explore veg-fed, antibiotic-free segment and position soy as a key ingredient.” The Directors requested a level of innovativeness to support new volume through the value chain with the existing product. If the innovative approaches in this POP are successful, estimated market impact will be over $425 million per year. ADM Animal Health and Nutrition has committed $52,931 in collaborative funds.

Section B. EVALUATION CRITERIA

1: Strategic Importance
The proposal will increase U.S. soybean meal (SBM) inclusion rates in feed rations due to recognition of its superior constituent/component value as specified in USB’s LRSP.
- The proposal will strengthen USB’s relationships with animal nutritionists by discovering new dimensions in SBM’s value bundle.
- The proposal advances relevant, strategic partnerships with the largest U.S. SBM customers by demonstrating an interest in advancing the value they get from our product.
- McDonald’s, Chick-Fil-A, Subway, Panera, and Dunkin Donuts have committed to antibiotic free chicken. With adopters this size, it is only a matter of time before these niche markets become much more than niches. SBM inclusion rates in antibiotic-free chicken diets are currently 20% higher than in conventional diets.
- This proposal opens a new window of opportunity for SBM gaining wider recognition as a product that benefits animal’s health.
- New volume generated from this POP would be 1.315 million tons (MT) in a 33.1 MT market (USDA).

2: Value Impact
This proposal will further grow the 33.1 MT ($10.7 billion) U.S. SBM market by demonstrating that SBM can contribute to animal health. If proven, potential value to the soybean sector is over $425 million (USDA), $389.47 million to the broiler sector and $37.3 million to the swine sector.
- Yes. It has the potential to significantly increase the customers’ demand for constituent pricing.
- Cost of the proposal is $119,085 and potential benefit is over $425 million.
- This proposal will drive further adoption of U.S. soybean meal by showing it has health benefits previously unrecognized.
- The end user benefit is that they will be better able to meet their customers’ demands in a more cost-effective way while increasing soybean meal use.

3: Execution Feasibility
The only challenge is that when you work with biological systems complicating factors such as disease can interject themselves and disrupt the trials. We see the likelihood of environmental factors complicating these trials as low.
- We anticipate market acceptance of these findings being high and that implementation and adoption challenges will be low.
- ADM Animal Health and Nutrition has committed $52,931 in collaborative funds. If approved, financial commitment will be sought from QSSBs.
- Partners are among the most respected animal nutrition researchers in the U.S.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.

Section A: PROPOSAL SUMMARY

This POP is designed to support the Feed Demand-Livestock and Poultry Roadmap with specific focus on the Market Outreach chevron which reads “Defending U.S. soy market share through segmented outreach approach with a focus on current soybean meal (SBM) advantages, nutritional bundle research and gathering end-user needs.” The Directors requested outreach to existing customers with existing products. Successful completion of this proposal will result in value of target markets increasing $158 million in FY17/18 from about $3.8 billion in FY16/17 (USSEC) to $4.0 billion in FY17/18. This proposal is interdependent with the following proposals: Animal Nutrition Working Group Regional Feasibility Pilot – WW Collaboration and Animal Nutrition Working Group Regional Feasibility Pilot – Comm Collaboration.

Section B: EVALUATION CRITERIA

1: Strategic Importance

This proposal will increase U.S. soybean meal (SBM) inclusion rates in feed rations due to recognition of its superior constituent/component value as specified in USB’s LRSP.
- The proposal will strengthen USB’s relationships with animal nutritionists in greater Europe and ASEAN by helping them better understand how the value bundle of U.S. soybeans and SBM offer advantages over competing ingredients.
- By engaging animal nutritionists, this proposal advances relevant, strategic partnerships with large customers in large markets.
- The market is very competitive but the target should be interested in getting more value from U.S. soybeans and SBM.
- This proposal builds quality relationships with USB’s largest customers in their respective regions, opening new windows of opportunity for advancement of constituent/component pricing.

2: Value Impact

This proposal aims to create an additional $158 million in value for the U.S. soy industry, based on estimates from USSEC. It will achieve this objective by engaging animal nutritionists to remind them of the multiple advantages of U.S. soy products.
- This proposal improves grower profitability by increasing demand.
- This proposal has potential to advance constituent pricing.
- Cost of the proposal is $127,520 as compared to the FY16/17 value of the combined markets at $3.8 billion.
- This proposal will drive adoption of U.S. soy market offerings by directly engaging the largest buyers in these important markets.
- The final solution will increase the growth efficiency of the end users’ animals, boosting profit and encouraging expansion.

3: Execution Feasibility

Continued strong efforts are needed to address the clearest technical challenges in this area, which are related to continued advancement by the South American soy complex and alternative ingredients providers, especially synthetic amino acids suppliers and new improved canola varieties. Further developing close relationships with influential animal nutritionists in these markets should provide the checkoff with important allies, who not only purchase a lot of U.S. soy products but whose actions influence their peers.
- Other challenges can include market shocks like weather events, anti-dumping duties or potential bans related to concerns over foreign animal disease transfer.
- This is a technically complex proposal to advance. The deep experience and quality relationships that the checkoff brings from all three primary contractors should see it to success.

Section C: SPECIAL CONSIDERATIONS (optional)
This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Section A: PROPOSAL SUMMARY

U.S. soy has a superior amino-acid profile when compared to soybean meal from other origins. Animal nutritionists understand the nutrient requirements for various animal species but do not necessarily recognize the value of U.S. soybean meal’s nutritional bundle and instead, might formulate with other competing products. This proposal targets animal nutritionists in Europe and S.E. Asia as well as pilot collaborative effort with the other primary contractors modeled after the Animal Nutrition Working Group in the States as well as in the EU and S.E. Asia. The focus is on bringing nutritionists together and hearing firsthand what they are seeking from U.S. soy and driving that message back to the supply side of the business. A series of mini collaborative meetings with the domestic Animal Nutrition Working Group and the EU & SEA groups is being proposed with a culminating session planned during the Global Trade Exchange (GTE). Directors requested experienced contractors to execute a mix of proposals mostly defending the core targeting the poultry and swine sector. Since this is a collaborative effort conducted among the three primary contractors, this proposal is interdependent with the following proposals: Animal Nutrition Working Group Regional Feasibility Pilot – Domestic Collaboration, and the Animal Nutrition Working Group Regional Feasibility Pilot – Communications Collaboration.

Section B. EVALUATION CRITERIA

1: Strategic Importance

With 98 percent of U.S. soybean meal going to animal agriculture, this sector is the single largest customer for the U.S. soy industry (Source: Soyatech. [http://www.soyatech.com/soy_facts.htm]). The sector is expected to continue growing significantly as meat demand increases particularly in developing countries. At the same time, demand is growing for feed inputs and feed nutritionists have more choices than ever to formulate their feed rations. U.S. soy must continue to highlight the U.S. soy advantage compared to other feed ingredients such as other soybean origins, proteins, and synthetic amino acids. This should help build preference for U.S. soy. This proposal primarily seeks to address Objective B (Feed mill nutritionists will increase U.S. soybean meal inclusion rates in feed rations due to recognition of its superior constituent/component value).

2: Value Impact

USB’s global customer survey conducted spring 2017 revealed that only 57 percent of surveyed customers agreed that meal made with U.S. soybeans is better in feed formulations and 59 percent said that they prefer feed made with meal from U.S. soybeans because the feed nutrient components produce better results. As a pilot project that could be expanded to other parts of the world, this proposal seeks to boost target audience awareness and preference in Europe and S.E. Asia for U.S. soy to increase market share. Currently, the U.S. accounts for only 1.9 percent of the meal market share in Europe (33.3 percent of total soybean volume) and 17 percent of the meal market share in S.E. Asia (29.1 percent of the total soybean volume) (Source: USSEC Market Snapshots). If successful, it is anticipated that U.S. soy could account for increased orders at a level to be determined at a future date. Nutritionists are a critical link in the value chain and an important target audience to help change perceptions about constituent pricing, making this an important opportunity. The U.S., EU, and SEA markets are highly attractive for U.S. Soy and the growth potential can be accelerated by ensuring that leading nutritionists from around the world are jointly working on solutions. This proposal will help provide more insight into what kind of nutritional bundle is most needed, how long it will take to develop it, and at what cost. Given the collaborative effort being put forth by the 3 primary contractors, via research, practical application, and solid communications, this proposal should ultimately position U.S. soybean farmers with additional profit opportunities. This proposal aims to create an additional value by comparing the relatively low cost of the proposal against a potential $3.8 billion dollar market. In the end the increased animal growth efficiency should assist in boosting profits and encouraging expansion.

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $41,550 from USDA. USB does not anticipate challenges with executing the activities covered by this proposal, as a great deal of trust already exist between this Target Audience and the Primary contractors. This is an opportunity to leverage the relationships built in the States with those built in the international market place in an effort to improve the understanding of what attributes are important in all markets. Because this is a collaborative proposal between USB’s three primary contractors, close coordination is necessary.

Section C: SPECIAL CONSIDERATIONS (optional)
Through this proposal, influential aquaculture producers and feedmills will be identified in key target markets including the Americas, China, S.E. Asia, Asia Sub Continent, and also some countries in Europe and the Middle East North Africa and encouraged to adopt recommended feeding practices through technical training, feeding demonstrations, trade teams, conferences, and sponsorships of producer associations. It will fund experienced team members who will interact directly with key nutritionists, buyers and producers who make the decisions of which ingredients to source. This proposal satisfies Directors’ requests to drive up demand of U.S. soy in aquafeeds and that USB leverage experienced contractors as well as other aquaculture-focused organizations such as the Soy Aquaculture Alliance, industry organizations and certification standards bodies like Best Aquaculture Practices and the Aquaculture Stewardship Council. This proposal is not interdependent with any other proposals.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The writing is on the wall regarding overfishing our wild resources. Our natural resources are becoming limited, which is an environmental issue relative to the decreasing supply of these natural resources, as well as an economic issue, relative to the increasing price of feed. With demand for seafood around the world higher than ever, aquaculture production must expand to supply the world as wild caught seafood cannot sustain this demand. By 2030 (according to FAO), an additional 41 million tons of fish and shrimp per year will be needed to maintain current levels of seafood consumption which could result in 13.5 million tons (631,834,000 bu.) of additional soy demand for feed assuming optimal soy utilization (source: FAO). Today, around 18.5 million metric tons (865,847,133 bu.) are estimated to go into global aquafeeds, almost 6 million metric tons (280,815,000 bu.) of which are U.S. U.S. soy provides a sustainable feed solution, but species needs vary and new producers lack awareness of the advantages of using U.S. soy in their aquafeed and the associated production practices. In each of these target markets, USB seeks to educate primarily feed mills and influential aquaculture producers about the advantages of using U.S. soy based aquafeed and the economic and environmental benefits of in-pond raceway aquaculture. This proposal primarily seeks to address USB’s LSRP Meal Demand goal Objective D (End Users will capitalize on the quickly growing opportunity which lies in the growing aquaculture and therefore aquafeed sector).

2: Value Impact

Global aquaculture has grown at least 8% growth per year in last two decades, according to FAO, and that growth is projected to continue at the same pace if not more rapidly. With the world’s seafood demand being higher than ever and forecasts of that trend continuing, coupled with wild catch being stagnant, aquaculture has to grow to meet the ever-increasing demand. USB has an opportunity to help the targeted aquaculture producer and feed sectors to meet seafood demand around the world sustainably and profitably. But what does that mean for the profitability of U.S. soy producers? Depending on the region, aquaculture’s share of soybean meal consumption ranges between 3.6 percent in the Americas region to more than 13 percent in the core markets of S.E. Asia and North Asia (source: USB Marketview Database). This is significant and could grow with expanding demand for seafood. With this $2.7 million request, USB has an opportunity to directly influence key buyers, feed mill nutritionists and end-users to build a preference for U.S. soy in aquafeed production and use., helping to ensure that U.S. soy captures this important sector.

3: Execution Feasibility

In FY18, we anticipate this proposal will leverage $3,500,000 in third party funds including $1,000,000 from QSSBs, $446,000 and from USDA/FAS. Importantly, this proposal will fund on the ground technical staff who will interact directly with our key customers. The majority of this coming from the Chinese aquaculture industry and government in China. This should help minimize potential challenges or roadblocks in executing proposed activities.
Section A: PROPOSAL SUMMARY
This proposal focuses on aquaculture producers in the MENA region to build an understanding of the benefits of using aquafeed made with U.S. soy. This proposal will help fund trade promotion and technical servicing through trainings, a seminar, an investment workshop, and soybean meal value research. There will be a particular focus on Egypt's tilapia industry to offset the highly seasonal nature of tilapia production, helping them diversify the timing of production and the fish varieties produced, as well as improving Egypt's cold chain. Directors requested that we leverage experienced contractors as well as other aquaculture-focused organizations, industry organizations, and certification standards bodies. This proposal is not dependent on other proposals.

Section B. EVALUATION CRITERIA

1: Strategic Importance
The aquaculture sector in the MENA region is rapidly expanding offering opportunities for increased utilization of U.S. soybean meal, particularly in Egypt, the region’s largest producer. The U.S. soybean industry has established itself as a global leader in educating the sector about sustainable production and feeding practices. However, in this competitive global environment, U.S. soy is at a critical juncture to ensure U.S. soy is the preferred protein in aquafeed. According to USB field staff estimates, fish consumption in Egypt is approximately 22 pounds per capita. Consumption is growing at a 10 percent rate and the existing gap in supply must be met with 400,000 MT of frozen imports. Increased domestic production could help offset the need for fish imports. Consumption elsewhere in the region is lower, approximately 11-13 pounds per capita (less than 1/3 of the world average), offering many opportunities for increased consumption. Iran produces approximately 175,000 MT, and Lebanon, Jordan, Israel, and Saudi Arabia combine for approximately 75,000 MT. In terms of advancing strategic partnerships, this proposal would fund a soybean meal value research project in Egypt, supporting work with Worldfish to assist them in developing optimized soy diets for their genetically selected fast growing tilapia strain - with an emphasis on U.S. soy amino acid profile. This activity, along with the additional efforts planned for other parts of the region, would address USB’s LRSP Meal-Demand goal Objective C (End Users will understand the benefits of U.S. soy protein for feeding poultry, swine and aquaculture species).

2: Value Impact
In FY15/16, it is estimated that Egypt used 553,000 MT of soy in aquaculture, but only 166,000 MT (30%) were of U.S. origin (Source: USB field staff estimates). USB has substantial opportunity to impact aquaculture in MENA. The growth is fast and the technology is changing. The primary opportunity is to continue training local producers of aquafeed and providing them with technical assistance to boost and inclusion rates and U.S. market share. Additionally, disseminating new aquaculture production methods can spur aquaculture producers themselves driving increased demand for U.S. soy.

3: Execution Feasibility
In FY18, this proposal could leverage $11,000 in third party funds from USDA/FAS. It should be noted that the Egyptian government is putting resources toward the addition of five large aquaculture farms (7000 hectares each), but has not yet identified the species that will be raised there. U.S. soy could benefit by encouraging the raising of species that do well with soy. We do not anticipate any challenges implementing these activities.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

U.S. soy provides a sustainable aquaculture feed solution, but the nutritional requirements of each species vary with limited information or research regarding optimum feeding requirements. In response, this proposal funds management and upgrading of the aquaculture species feed formulation database, database training workshops, and an aquafeed formulation specialist. While focused on the S.E. Asia region, results would have applicability around the world as the database has grown to include the top 27 species which are raised around the world. The purpose is to move the discussion of U.S. soy from an ingredient basis to that of a nutrient basis in aquafeed formulations. This proposal satisfies the directors’ requests to drive up demand of U.S. soy in aquafeeds and that proposals leverage experienced contractors as well as other aquaculture-focused organizations such as the WorldFish, Cargill, and industry organizations and certification standards bodies. It should be noted that funding for key contractors who would partially oversee management of this proposal are included under proposal #1810-353-0536.

Section B: EVALUATION CRITERIA

1: Strategic Importance
As demand for seafood around the world grows, aquaculture production must expand to supply the world as wild caught seafood cannot sustain this demand. By 2030, an additional 41 million tons of fish per year will be needed to maintain current levels of seafood consumption. Optimizing feeding practices will be a priority to ensure the long-term sustainability of the sector. This proposal primarily seeks to address USB’s LRSP Meal Demand goal Objective D (End Users will seek out feed made with U.S. soy because of its consistency, superior amino-acid profile, and uniformity.) But, other objectives for the Meal Demand goal will also be impacted including A, B, and C. This proposal helps USB differentiate U.S. soy from competing products while advancing the U.S. soy advantage and value capture.

2: Value Impact
The U.S. soybean industry has established itself as a global leader in educating the sector about sustainable production and feeding practices, helping to boost U.S. soy inclusion rates in aquafeed formulations. In 2016, it was estimated that just under 18.5 million metric tons of soy products were used in global aquaculture feeds, with the U.S. accounting for roughly 6 million metric tons (32 percent market share; 280,815,000 bu.) By 2020, it is estimated that with USB’s market development efforts, U.S. market share could grow to 45 percent accounting for 9 million metric tons (421,223,000 bu.) of the expected 20 million metric tons (936,051,000 bu.) that will be needed to supply the global aquaculture sector. A key part of this growth prospect is the feed formulation database and associated support activities. In S.E. Asia specifically, where this database sprouted from, it is estimated that 2.7 million metric tons (126,367,000 bu.) of soybeans were used in aquafeed production in 2010. By 2015, it is believed that figure grew to 3.3 million metric tons (154,448,000). By 2020, it is expected that demand in S.E. Asia’s aquaculture sector could grow to 4 million metric tons (187,210,000). Over this time, this proposed feed formulation database should allow for more targeted formulation on a nutrient basis, allowing shadow pricing of U.S. soy like what is being done with U.S. soy and terrestrial animal formulation, and more efficient production practices. This is the best tool we have to drive higher inclusion rates of U.S. soy in aquafeeds.

3: Execution Feasibility
USB’s aquaculture program has leveraged millions of dollars in third party support over the years. The creation of this database was done with a very minimal investment from state checkoff funds and leveraged funds from other aquaculture and feed-related organizations. This proposal is expected to leverage $147,950 in QSSB funds. Importantly, the contractors that will implement this work have years of experience working on behalf of USB in the aquaculture sector. This experience should help mitigate any potential challenges or roadblocks in executing the activities planned in this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)
This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.

**PROPOSAL ON A PAGE**

**POP Name:** Industrial Meal Adhesives  
**Short Name:** Adhesives  
**Proposal #:** 1840-352-0702  
**Requested Budget:** $449,471  
**Last Gate Score, if applicable:**  

**Section A: PROPOSAL SUMMARY**

This POP is designed to support the Demand/Meal/Industrial Uses roadmap, with specific focus on the FY18 New Uses chevron, stages 3 and 4. It combines 4 activities (Activity A - Columbia Forest Products, Activity B - Auburn University, Activity C - Arro and Activity D- Arro). All are independent, but part of the critical path to address the LRSP objective A/end user’s audience. The LRSP Meal – Industrial Uses goal is to grow the market by 70,000 tons (2.9 million bushels) per year in 2021.

Columbia Forest Products (CFP) produces wood veneer panels. Soy flour is the major component of the adhesive system. CFP will use an additional 19,500 to 39,000 tons (1-2 million bushels) per year by 2021.

Auburn University has licensed a process to an industrial partner for oriented strand board (OSB) adhesive made with soy flour. Market potential for this program is 60,000 tons soy flour (3 million bushels). Auburn is scaling up the technology with their industrial partner. FY 2018 budget $160,787; leverage $128,000.

Arro Corporation is building additional capacity to sell adhesives to the paper industry. Plant capacity will be 10 million pounds isolate (700 thousand bushels). FY 2018 budget $98,360; leverage $150,000. 90% chance of success.

Arro Corporation is developing a natural cat litter based on the carbohydrate stream with soy oil for dust control. Market expectation is 5,250 tons (700 thousand bushels). Arro Corporation is developing a natural cat litter based on the carbohydrate stream with soy oil for dust control. Market expectation is 5,250 tons (700 thousand bushels).

Columbia Forest Products (CFP) produces wood veneer panels. Soy flour is the major component of the adhesive system. CFP will use an additional 19,500 to 39,000 tons (1-2 million bushels) per year by 2021. FY 2018 budget $102,204; leverage $300,000.

Auburn University has licensed a process to an industrial partner for oriented strand board (OSB) adhesive made with soy flour. Market potential for this program is 60,000 tons soy flour (3 million bushels). Auburn is scaling up the technology with their industrial partner. FY 2018 budget $160,787; leverage $128,000.

Arro Corporation is building additional capacity to sell soy based adhesives to the paper industry. Plant capacity will be 10 million pounds isolate (700 thousand bushels). FY 2018 budget $98,360; leverage $150,000. 90% chance of success.

Arro Corporation is developing a natural cat litter based on the carbohydrate stream with soy oil for dust control. Market expectation is 5,250 tons (700 thousand bushels). This product will include 175,000 pounds commodity oil for dust control. FY 2018 budget $88,120; leverage $60,000.

**Section B. EVALUATION CRITERIA**

1: Strategic Importance

Adhesives are a traditional use of soy in industrial applications with a long history of market participation. The strategy is to grow the market in areas that are familiar with soy.

Columbia Forest Products (CFP) produces wood veneer panels. Soy flour is the major component of the adhesive system. CFP plans to continue to expand usage as well as sell adhesive to others in the wood veneer market once bleed through issue resolved. Auburn University has licensed a process to an industrial partner for oriented strand board (OSB) adhesive made with soy flour. Auburn is scaling up the technology with their industrial partner Norbord. Norbord is the market leader in OSB with 40% market share. Success in wood adhesives at CFP and Auburn should have additional value in the plywood market.

Arro Corporation is building additional capacity to sell soy based adhesives to the paper industry. This is a traditional market for isolated soy protein adhesives. New products will expand markets in the US and EU. Arro should be able to expand sales into the EU for paper, bottle label adhesive, and leather finishing.

Arro Corporation is developing a natural cat litter based on the carbohydrate stream with soy oil for dust control. Market expectation is 5,250 tons (700 thousand bushels). This product will include 175,000 pounds commodity oil for dust control. This is a novel use of the carbohydrate stream that could grow with time.

2: Value Impact

The LRSP Demand Meal – Industrial Uses goal is to grow the market by 70,000 tons (2.9 million bushels) per year in 2021.

Columbia Forest Products (CFP) produces wood veneer panels. Soy flour is the major component of the adhesive system. CFP will use an additional 19,500 to 39,000 tons (1-2 million bushels) per year by 2021. CFP has 13 production facilities. The value to CFP is that the adhesive cost is 20% lower with the soy system.

Auburn University has licensed a process to an industrial partner for oriented strand board (OSB) adhesive made with soy flour. Market potential for this program is 60,000 tons soy flour (3 million bushels). Auburn is scaling up the technology with Norbord their industrial partner. Norbord has 15 OSB production facilities. The value in OSB is 25% reduced adhesive cost at equal performance.

Arro Corporation is building additional capacity to sell soy based adhesives to the paper industry. Plant capacity will be 10 million pounds isolate (700 thousand bushels). In paper coating, soy protein adhesives provide improved finished quality performance as well as cost savings.

Arro Corporation is developing a natural cat litter bases on the carbohydrate stream with soy oil for dust control. Market expectation is 5,750 tons (500 thousand bushels). This product will include 175,000 pounds commodity oil for dust control. This novel idea takes the carbohydrate waste stream and creates a product for an established market.

3: Execution Feasibility

Columbia Forest Products (CFP) has discovered a technical issue with adhesive bleed through that has slowed the adoption of the new adhesive formulation at the other 18 CFP production facilities. FY 2018 is suggested to address the adhesive bleed through issue to allow full adoption of the technology. No market issues. FY 2018 budget $103,744; leverage $300,000. 90% chance of success.

Auburn University has licensed a patented process to Norbord for oriented strand board (OSB) adhesive made with soy flour. There will be issues as the technology is scaled up. Norbord is the OSB market leader, no market issues anticipated. FY 2018 budget $160,787; leverage $128,000. 75% chance of success.

Arro Corporation is building additional capacity to sell adhesives to the paper industry. Strong product line. Delays in plant expansion. Customers waiting for product. FY 2018 budget $98,360; leverage $150,000. 90% chance of success.

Arro Corporation is developing a natural cat litter based on the carbohydrate stream with soy oil for dust control. Technical challenges mostly answered. Market entry is slow due to route to market unfamiliarity. FY 2018 budget $88,120; leverage $60,000. 60% chance of success.

**Section C: SPECIAL CONSIDERATIONS (optional)**

FY 2018 should be the last year of funding for Activity A-CFP and Activity C-Aarro paper coating as they will be considered successful.
**Section A: PROPOSAL SUMMARY**

This POP is designed to support the Demand/Meal/Industrial Uses roadmap, with specific focus on the FY18 New Uses chevron, stages 3 and 4. It combines 3 activities (Activity 1 - South Dakota Innovation Partners, Activity 2 - University of Akron, Activity 3 - Rice University), all are interdependent and are part of the critical path to address the LRSP objective A/end user’s audience. The LRSP Meal – Industrial uses goal is to grow the market by 70,000 tons (2.9 million bushels) per year in 2021.

South Dakota Innovation Partners (SDIP) is building a production facility for ME-PRO® feed in South Dakota. Their soy process enriches protein to 70%, changing the amino acid profile to make the resultant protein more digestible for aquaculture and terrestrial animals and adds critical trace nutrients. Project phase 1 will produce protein and run an ultrafiltration process to minimize losses. The operation will process 30,000 tons (1.26 million bushels) soybean meal per year by 2021. FY 2018 budget request $625,000, which will leverage $60,000,000 from senior lender debt and investor equity.

Phase 2 of this project has direct application for SDIP as well as all other soy protein processors. Akron and Rice universities will work together to perfect a process to make industrial chemicals from the carbohydrate waste stream of SDIP. The process is scheduled to be implemented at SDIP once perfected, but has direct application at every soy protein processor. The goal of this work is to find value in a waste stream that is often landfilled or processed in water treatment. Finding more value from each bushel increases the attractiveness of the business case for soy. Akron FY 2018 budget $74,410; leverage $55,950. Rice FY 20018 budget 144,856; leverage $107,000.

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**Section B: EVALUATION CRITERIA**

1: **Strategic Importance**

The LRSP Demand Meal – Industrial Uses goal is to grow the market by 70,000 tons per year in 2021. Phase 1 of the SDIP project will process 30,000 tons per year of soybean meal (SBM) by 2021. The product from SDIP has a modified amino acid profile and reduced anti-nutritional carbs that makes it easier to digest and removes many restrictions on amount of soy that can be fed in animal diets. The strategic importance is not only the processed volume, but the technology that removes conventional SBM feed restrictions based on amino acid content and anti-digestive carb restrictions for monogastrics.

Phase 2 of this project is to treat the waste stream of SDIP to create saleable chemicals significantly reducing process out flow. This is a direct managed effort with University of Akron, Rice University and a yet to be named engineering firm. Akron and Rice will continue to work together to develop technologies to produce saleable chemicals from the waste stream of soy processing plants. The budget includes funds for a yet to be named engineering group to clean up the chemicals (separate from waste) for sale. SDIP is the current partner, but technology developed with this project can be applied to any soy protein processing plant (ADM, Solae, CHS, etc.). These chemicals range in value from $0.3 to $3.00 per pound for high volume commodity chemicals and higher for specialty chemicals. Delivering more value from each bushel will expand the market attractiveness for soy processing businesses.

2: **Value Impact**

SDIP phase 1 will increase SBM usage by 30,000 tons per year by 2021 against the LRSP goal of 70,000 tons per year market growth by 2021. SDIP’s ME-PRO® will be very cost competitive compared to fish/animal protein, offering additional microbial protein and nutritional trace material content without concerns about animal virus carryover. ME-PRO® will fundamentally change the value structure of soy by removing feed limits due to amino acid profile, reduction of anti-nutritional carbs, and additional nutrients.

Phase 2 will address a fundamental issue of improving the value of the waste stream. Each 60-pound bushel has 27.5 pounds of carbohydrates that are not recovered as oil or concentrate. This proposal will determine the process cost to convert soy carbs into succinate and fatty acids which will sell for $1 - 2/lb., but some of these processes in future be used to make chemicals >$10 /lb. The carbohydrate stream will provide a very low cost starting material for the manufacture of saleable chemicals.

3: **Execution Feasibility**

Phase 1 of the SDIP project is scaling up a process that works on the large pilot scale. No impediment is anticipated in the soy modification step. The protein reclaim (ultrafiltration) step has some historical technical challenges with membrane plugging. The product can be made without the ultrafiltration stream, but it reduces profitability. Ultrafiltration is practiced in other industries such as wastewater and food and can be mastered. This issue can only be resolved when the production facility is running. SDIP has done a good job of market anticipation in aquaculture and terrestrial animal testing. No market issues have been detected. FY 2018 budget request $625,000; leverage $60,000,000. Phase 1 has a ~90% chance of success.

Phase 2 has shown promise in the lab and small scale processing, and opens a range of chemical products with high volume and varying commercial prices, all much greater than SBM. Technical challenges 1) process scale up to produce the chemicals and 2) clean-up of the chemicals to standard grades and concentrations. This is accomplished in other industries and should be able to be completed for soy processing. It is a matter of persistence. The market challenge will be in the recovered chemical price. Processing and selling the product has to be financially better than the other disposal options. Akron FY 2018 budget $74,410; leverage $55,950. Rice FY 20018 budget 144,856; leverage $107,000. Phase 2 has a 70% chance of success.
PROPOSAL ON A PAGE

POP Name: Industrial Meal Support
Short Name: Meal Support
Proposal #: 1840-352-0708
Requested Budget: $380,540

This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Section A: PROPOSAL SUMMARY

Efforts in Taiwan would focus on educating buyers about the advantages that U.S. soy provide (both intrinsic and extrinsic) through digital and personal communication with Taiwanese soy food producers, in a country with morphing food safety concerns, highlighting the safety of U.S. biotech soybeans and the advantages of sustainably produced U.S. soy; a trade team visit for Taiwan’s larger soy food processors to experience, first-hand, the caliber and quality of U.S. soybean production and handling systems; and sponsorship of soy food industry meetings and conferences. Given the importance of these two markets to the U.S. soy industry, USB directors wanted investment here and asked for proposals that defend core markets with education and communication on benefits including shelf-life, etc. They sought focused and targeted proposals that provided new ideas. This proposal responds to these director requests. In Indonesia, funding covers technical support contractors, meetings and workshops throughout the country driving preference for requesting/buying U.S. soybeans, trade missions structured to prove the U.S. soy advantages to Indonesian soy food importers, and working with the Indonesia Tempe Forum (ITF) to ensure the expansion of hygienically produced tempeh using U.S. soybeans. This proposal is not interdependent with any other proposal.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Indonesia is currently the world’s 4th largest customer for U.S. soybeans (Source: USDA). Over 95 percent of the soybeans imported are used in the production of the traditional staple soy food Tempeh (Source: USB Field Staff Estimates). Taiwan is the world’s seventh largest importer of U.S. soy (Source: USDA). Ten percent of the imports (~240,000 metric tons or 8,817,600 bu,) are used for soy foods for which the U.S. accounts for 70 percent (Canada supplies the remaining 30 percent) (Source: USB Field Staff Estimates). Regulatory threats in both markets could impact U.S. market share, with supplies increasing from Canada. Communicating the advantages of U.S. soy compared to the Canadian competition could help maintain market share in Indonesia and register a market share boost in Taiwan as outlined in the milestones for the objectives associated with USB’s LRSP Food Export goal. USB’s in-country staff can deploy key personnel into the field who interact directly with key target audiences and indirectly through many food manufacturer associations, allowing USB to extend the reach of its core messages.

This proposal primarily seeks to address Objective B (Food manufacturers in Taiwan and Indonesia will seek U.S. soy exclusively for their food manufacturing needs.) But work will also help achieve objective A [Food manufacturers in Taiwan and Indonesia will view the U.S. as the world’s most reliable source of high quality soy protein and whole soybeans and will understand the benefits (economic, technical, and nutritional) of these products].

2: Value Impact

This proposal creates value for U.S. soybean famers by defending U.S. soy market share in two key export markets. As the fourth and seventh largest export markets for the U.S. soy industry, Indonesia and Taiwan are very important customers with a large share of those imports being used in the human food sector (Source: USDA). This proposal includes several activities that focus on differentiating U.S. soy from growing Canadian competition. Return on investment in this proposal could be characterized as the market share defended in Indonesia and recaptured in Taiwan in line with 2021 milestone goals.

3: Execution Feasibility

This proposal has the potential for leveraged third party funds from USDA/FAS totaling $286,532. Additional funds could be made available through QSSBs. We do not anticipate any technical challenges in the execution of this proposal since USB’s in-country teams have been working with the soy food sector for many years. However, regulatory threats such as an expansion of biotech labeling laws in Taiwan and government food security regulations in Indonesia could impact the success of USB’s efforts, in addition to affecting market share. Issues will be monitored among a larger trade policy proposal submitted under the Sustainability Roadmap.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Name: Promoting New Utilization in Indonesia
Short Name: FE-NU-B20
Proposal #: 1810-353-0936
Link to full proposal: 
Requested Budget: $13,834
Last Gate Score, if applicable: 

Section A: PROPOSAL SUMMARY

Building on the popularity of tempeh, food manufacturers in Indonesian have started to explore ways to incorporate tempeh into new, value added product lines. Tempeh chips (eaten as a snack like potato chips) are a recent example. Seeing this as a new opportunity for U.S. soy, this proposal seeks modest funding to conduct an introductory activity to identify potential value-added, tempeh based, food products and begin to understand opportunities in this new area. Explore and list new This addresses USB director’s request for efforts to grow new demand by developing new value chain distribution and product/marketing opportunities. This is a stand-alone proposal. However, much of the activity support for the balance of the food export program in Indonesia is part of proposal #1810-353-0934.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Indonesia is currently the world’s 4th largest customer for U.S. soybeans (Source: USDA). Over 95 percent of the soybeans imported are used in the production of the traditional staple soy food Tempeh. (Source: USB Field Staff Estimates). The U.S. holds 90 percent of the imported soybean market share in Indonesia (Source: USSEC Market Snapshot). Based on anecdotal information, Indonesian tempeh producers say they prefer U.S. soybeans because of their color and uniform size. World-Grain.com reports that, “Despite rising incomes and a growing middle class, tempeh remains very cost competitive and maintains a popular place in Indonesian diets across social classes.” It is for these reason that USB directors are interested in maintaining U.S. market share in this important market. At the same time, food companies are seeking new ways to position this traditional food. USB directors sensed this opportunity to build new demand and are seeking proposals to explore options for growth.

This proposal primarily seeks to address Objective B (Food manufacturers in Taiwan and Indonesia will seek U.S. soy exclusively for their food manufacturing needs.) But work will also help achieve objective A [Food manufacturers in Taiwan and Indonesia will view the U.S. as the world’s most reliable source of high quality soy protein and whole soybeans and will understand the benefits [economic, technical, and nutritional] of these products].

2: Value Impact

Based on the Food Export roadmap, success in Y/E 2018 is defined as having identified food companies’ interest in developing new value chain distribution and product/market opportunities using U.S. soy protein. This proposal will focus on looking for companies that have strong potential for creating value-added, tempeh based, food products and determine the feasibility (stage 2) of future market development work (stages 3 and 4). At the conclusion of this activity, recommendations for next steps will be provided to USB.

3: Execution Feasibility

This proposal is not expected to leverage any additional, third party funding, however it will be pursued. We do not anticipate any technical or marketing challenges in the execution of this proposal. USB’s in-country teams have been working with the soy food sector for many years. However, government food security regulations in Indonesia could impact the success of USB’s efforts, in addition to affecting market share. While there is potential for regulatory policies to be implemented, it is believed that Indonesia’s reliance on soybean imports would overshadow any negative impact (Source: World-Grain.com). Issues will be monitored among a larger trade policy proposal submitted under the Sustainability Roadmap.

Section C: SPECIAL CONSIDERATIONS (optional)
This proposal focused on a variety of work being completed at the request of the QSSBs to fund work relevant to their state strategic plans in the food sector. Each state has different strategic objectives for the promotion of soy for food into the export market. The primary contractor for international provided a survey to the states asking them to provide insight into the types of proposals they would like to see implemented per their strategies. What is reflected here represents this. It is an array of trade servicing, trade teams, workshops, seminars, and the annual Natto summit in Japan. In addition, the proposal will fund a senior food consultant for the SEA market outside of Indonesia.

Section B. EVALUATION CRITERIA

1: Strategic Importance

No impact as the goals being addressed are directly related to the various state QSSB’s goals.

2: Value Impact

The proposal has the potential to impact profitability for U.S. soy growers insomuch as they export beans into the traditional food markets.

3: Execution Feasibility

No major challenges exits to implementation.

Section C: SPECIAL CONSIDERATIONS (optional)

It is anticipated that QSSBs will provide $968,543 to fund these activities.
Oil Target Area
FY18 Final Portfolio

July 20th, 2017
Oil TA Portfolio Balance by Risk Reward

- Risk
  - Low
  - High
- Reward
  - Low
  - High

- Not Funded
- Funded
Oil Target Area Portfolio Spend by Track

Where to Play?

EXISTING
Customers/Value Chain

NEW
Customers/Value Chain

EXISTING
Products & Production

NEW
Products & Production

How to Win?

New Volume
43%

Breakthrough

Existing
Core
44%

Differentiate US Soy
13%
Oil Target Area Portfolio Spend by Roadmap

<table>
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<tr>
<th>Roadmap</th>
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<tr>
<td>Soy Constituents</td>
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<tr>
<td>Oil Diversity</td>
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<tr>
<td>Industrial Uses</td>
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Oil Target Area Portfolio Spend by Program Maturity

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Oil Target Area Portfolio Spend by Audience

- End Users: 67%
- Farmers: 3%
- Seed Companies: 7%
- Public: 3%
- Researchers: 3%
- Crushers: 2%
- Elevators: 4%
- Sales Desks: 5%
- Unallocated: 0%
- Buyers: 9%

Value Creation Framework: FY18 Portfolio 7/20/2017
### Section A: PROPOSAL SUMMARY

One of the largest remaining constraints to regaining market share with high oleic soybean oil in the food industry is providing a consistent and reliable supply of high oleic soybeans from U.S. soybean farmers. This proposal will leverage existing channels to share messages that encourage farmers to contract high oleic soy acres in areas where it can be grown, focusing on key benefits – yields competitively with top-performing varieties, provides a functional and sustainable solution for customers and earns a premium at the elevator. Outreach activities will be strategically promoted to farmers who are able to act on the information provided – those farming within 50 miles of a high oleic delivery location. The proposal will build on successful, collaborative communications and outreach partnerships with seed companies, processors and QSSBs working to increase farmer awareness and adoption of high oleic soy.

### Section B. EVALUATION CRITERIA

1: Strategic Importance

The soy checkoff invested in the development and expansion of high oleic soy to address the loss of significant market share in frying fats due to trans-fat labeling and the removal of the GRAS status of partially hydrogenated soybean oil. High oleic soy provides a functional and sustainable solution for food end users as well as industrial end users. The primary barrier for potential end users of high oleic soybean oil is a consistent, abundant supply – which can only be provided by rapid farmer adoption in areas where high oleic soybeans can be grown. High oleic soybean acreage has grown steadily over several years, with 450,000 acres planted in 2016 and 650,000 acres expected to be planted in 2017, but more acreage is required to meet customer demand, estimated to be 4.5 billion pounds of oil by 2021. This proposal urges planting of high oleic varieties through targeted messaging to farmers in a position to act on high oleic profit opportunities in their area, in those states where high oleic contracts are available and expanding.

2: Value Impact

As more farmers adopt high oleic and supply increases, additional end-user demand will improve profitability for all U.S. soybean growers. The checkoff estimates show the potential for a 9 billion-pound high oleic soybean oil market among these users which will require the soybeans from 18 million acres. This proposal builds on previous success with a sharp focus on leveraging partnerships with seed companies and processors. This proposal helps USB achieve its Sustainable Production goal in the Oil target area by encouraging farmers in the growing area to contract high oleic soy. More planted acres shows end-users that they can receive a consistent, abundant supply of high oleic soybean oil.

3: Execution Feasibility

Increased high oleic adoption is challenged by seed company and processor hesitation to broadly expand high oleic availability without global regulatory approvals and by farmer desire to see clear market signals from end-users before choosing high oleic. However, focused communications efforts in relevant growing areas have helped high oleic acreage to grow year over year, and provides a clear path forward for continued acreage expansion. This proposal builds on the cooperation and consistent messaging across USB and the value chain that is vital to the overall program’s success. Since 2014, awareness of high oleic soybeans has increased by 15 percent in states where high oleic is available, with 60 percent awareness today. Partnerships with seed companies have been strengthened over the last five years, and they attribute a lot of success with program growth to USB’s promotion of high oleic soy.
**Section A: PROPOSAL SUMMARY**

- The main deliverable of the proposal is to develop high oleic/low linolenic (HOLL) soybean lines and germplasm containing the Missouri non-transgenic high oleic trait that can be licensed to seed companies to produce commercial varieties to answer the USB goal of achieving 11.71 million acres of high oleic soybean planted by 2021.
- Contributes to Oil-Supply LRSP goal of 11.71 M acres of high oleic soy planted by 2021.
- Up to 8 soybean lines are expected to be released in 2018 in Maturity Group IV, V, VI and VII; followed by releases in all other Maturity Groups, 00 to VIII that represent another and diverse source of high oleic lines that can be commercialized.
- This breeding and genetics project proposal is poised to enter innovation Stage 3 to test advanced lines even as a continual pipeline has been established that is operating at full capacity given contemporary resources of an efficient winter nursery, marker-assisted breeding, etc.

**Section B. EVALUATION CRITERIA**

1: Strategic Importance

- Addresses LRSP goal in oil/sustainable production aimed at developing improved varieties for farmers.
- Fulfills Oil-Supply Road Map to expand sources of genetic diversity of high oleic germplasm such that a wide number of seed brands can be made available to growers in all maturity groups, particularly those not currently emphasized by Pioneer or Monsanto.

2: Value Impact

- Development of HOLL varieties contributes to the goal of making HOLL varieties available in all geographic areas, so all farmers can realize the premiums offered.
- The greater the presence of HOLL in the market, the more opportunity to recoup the soy oil market share lost to trans-fat ban and labeling.
- Overall value of soybean goes up as value of the oil is enhanced.

3: Execution Feasibility

- The HOLL market is ripe and demanding more acres to satisfy incentive of end users to switch to soybean HOLL in filling large contracts.
- The project is in its fourth year and on track to tackle technical challenge of integrating a 4-gene HOLL trait along with herbicide traits and selection for high yield; Oleic content averages 80% or better.
- Missouri Soybean Merchandising Council (MSCM) is actively developing licensing and commercial agreements with seed companies, as one seed company expects HOLL variety release in 2018 based on the trait and germplasm from this project.
- Leveraged funds exceed $500,000 from USDA and the respective QSSBs.
- Six states are represented on the project proposal with active support from their QSSBs; additionally, at least six other state QSSBs are supporting their breeders to develop HOLL lines using the Missouri high oleic trait.

**Section C: SPECIAL CONSIDERATIONS (optional)**

- Note that current development of HOLL even in the private sector is based on fundamental public research in modified oils, largely supported by USB and USDA over the last decade.
- The high oleic trait itself, developed by Missouri, is non-transgenic and therefore does not require expensive regulatory costs nor EU, China, etc. approvals.
### Section A: PROPOSAL SUMMARY

This proposal supports the oil diversity roadmap with a focus on identifying fatty acid pathways for targeted fatty acids. This proposal aims to increase seed oil content in soybean by a gene modification expected to increase flux through the initial stages of fatty acid biosynthesis. The researchers will use gene silencing and/or CRISPR-Cas9 gene editing to reduce expression of a negative regulator of fatty acid production. The proposal explores an innovative solution based on the biochemistry of oil production to increase oil content in seeds. This is an independent proposal, seeking a unique approach to achieve the milestone of increasing seed oil content. Successful completion of this program would result in an increase of dry weight oil content by 5% without compromising protein levels.

### Section B: EVALUATION CRITERIA

#### 1: Strategic Importance

This proposal directly addresses the LRSP goal of developing soybean varieties with increased oil content. The project is high risk-high reward. It is a basic research approach that was shown by the researcher to be successful in increasing oil content by up to 11% in Arabidopsis seeds. The proposal seeks to repeat this approach in soybean.

If successful, the approach could be used for any soybean variety and thus achieve 100% penetration with a 5% overall increase in dry weight oil.

#### 2: Value Impact

The value impact on growers will be to produce up to 5% more oil per acre with the same inputs. The value of this increase is approximately $3.7 per acre. This could advance constituent pricing to capture the increased oil content in seed.

To date, all commercial increases in soybean oil content have been modest and have been achieved by exploiting natural variation through breeding.

This proposal may result in a break-through to increase oil content to a level greater than attained by traditional breeding.

The researchers are building on a discovery from within their own laboratory.

#### 3: Execution Feasibility

Transgenic modification of the targeted gene for expression level is feasible, but takes time. The researchers have 15 possible independent transgenic events in hand. They need to confirm that they contain the desired modifications and that those modifications result in the expected phenotype (increased oil). The researchers have previously demonstrated this phenotype in the model plant Arabidopsis.

There are no partnerships or leveraging in place.

This proposal is for a 3rd year of funding. The research is moving forward, the researchers are capable of executing the work and have a proven track record with USB.

### Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

- Proposal supports the Oil Diversity Roadmap with particular focus on identifying fatty acid pathways for targeted fatty acids.
- Proposal is multi-faceted employing latest in biotechnology, biochemistry & breeding to achieve multiple deliverables to modify & increase oil:
  1. Develop transgenic constructs that can be integrated into soybean germplasm with a fatty acid profile that is beneficial to human health, including fatty acids such as arachidonic (AA), eicosapentaenoic (EPA), stearodonic (SDA) and docosahexanoic (DHA).
  2. Develop carbon flux map for soybean seed to answer Value Task Force key objective #3: Understand how additional carbon may possibly be shunted from the insoluble carbohydrate fraction to the lipid (oil) and/or protein fractions as means to increase content and break negative link of oil vs. protein.
  3. Develop lines and germplasm with ≥ 20.5% seed oil content (13% moisture) while maintaining protein content (≥ 35%) and yield.
- Value is significantly enhanced as these applications represent new market opportunities for oil utilization, and with soy varieties of higher oil & protein.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP in Oil/Sustainable Production to create innovation in oil composition that can be incorporated into commercial products by seed companies.
- Addresses Oil Diversity Roadmap to initiate a high degree of innovation by developing a number of new applications of modified oils that may open new market opportunities for soybean oil utilization.
- Soybean oil at 12.5 Billion pounds for edible usage commands only about half of the edible/human oilseed market. New modified oil applications open up opportunities to capture greater market share.
- Like the high oleic strategy, when a new modified oil application comes online, partnerships with O&B, MSL-Group, and others help bring it to market.

2: Value Impact

- New modified oil applications open up new markets for soybean oil beyond the current edible oils usage of 12.5 Billion pounds, and greater usage creates greater demand and price for soybean and soy oil.
- Development of new modified oil will likely require considerable time and expense to achieve the high degree of innovation, yet the reward of establishing new market opportunities or increasing oil market share pays off over a long time.
- Introduction of new modified oil could potentially add one Billion pounds to market share for soybean oil.
- From the breeding/genetics side of the project, increasing oil content in soybean without compromising protein raises the overall value of soybean and preference in the export market (>50% of all soybean usage).

3: Execution Feasibility

- The challenge to bring new modified oil market applications will require a full team approach, like the current high oleic strategy to involve all sectors of ag. business, processors, end-users, etc.
- The project team is up for the challenge of high degree of innovation as team includes the finest researchers in biotechnology and transformation (Clemente, Nebraska), genetics and biochemistry (McHale, Alonso, and others with high degree of collaboration and support that exists at Ohio St University and from Ohio Soybean Council), experienced breeders (Mian, Chen, Orazaly at USDA, Missouri, Arkansas respectively).
- Leveraging support from the respective QSSBs and USDA amounts to $775,000, nearly 2:1 ratio, not counting the free access to the top transformation lab in the country (Nebraska).

Section C: SPECIAL CONSIDERATIONS (optional)

- The Clemente lab at University of Nebraska has developed a number of high profile traits and biotech tools in use today in the soybean industry.
Section A: PROPOSAL SUMMARY

The goal of this oil diversity roadmap is to commercialize High Oleic soy varieties in MG I – MG V with Monsanto & Pioneer per the USB agreement. This POP represents two activities (Activity A – Pioneer ($2,000,000) & Activity B - Monsanto ($2,000,000)) and represents year 5 of 5 of the USB agreement with each seed technology company. During this 5-year research focus HOS variety commercialization started with MG 2 and successfully has initiated a targeted breeding program to backcross the High Oleic traits into earlier and later maturity groups to provide varietal breadth to reach the market goal of 18 million acres by 2025. All commercialized lines must equal or exceed current yield potential of commercial varieties along with strong agronomic package for the specific geographic area. Successfully commercializing these HOS varieties will provide a technical solution to regain much of the lost 4B lbs. of lost edible oil demand due to trans-fat labeling and revoking GRAS status of partially hydrogenated soybean oil (PHO’s). Both technology companies have incorporated HOS traits into their standard breeding program along with herbicide resistant traits. – primarily focusing on Xtend technology.

Section B: EVALUATION CRITERIA

1: Strategic Importance

This proposal represents a key partnership between USB and both DuPont Pioneer and Monsanto. This partnership provides High Oleic varieties MG1 – MG V which will allow the potential for varieties to impact 80% of U.S. soy planted acres. By 2025, the impact of the commercial release of HOS varieties will reach the LRSP goal of 18 Million acres. The proposal addressed the USB LRSP objective of engaging seed companies to commercialize High Oleic Soybean varieties on 11.17 acres by 2021. Successfully reaching the 18 MM acres target by 2025 will position High Oleic soybeans as the ‘4th largest’ commodity crop in the U.S. while displacing Canola and Palm as a key oil component for either food or industrial uses.

2: Value Impact

U.S. soy lost 4B lbs. of edible food demand due to trans-fat labeling and USDA revoking GRAS status of partially hydrogenated soybean oil (PHO’s). Traditionally, soybean oil was partially hydrogenated to provide the functionality profile the market required. Due to the increased oxidative stability of High Oleic soybean oil, U.S. soy market will be able to regain 3.4 lbs. (QUALISOY, 2016) of lost demand by 2025 which translates to $0.29 for every bushel produced or $15/acre. The market is actively evaluating HOS oil as a replacement for both Canola and Palm oil. In addition to regaining lost edible food demand, increased functionality allows for industrial application which will provide 1.3 B lbs. (2.5 MM bushels) of new demand (QUALISOY, 2016).

3: Execution Feasibility

DuPont Pioneer and Monsanto have breeding facilities and field laboratories through the U.S. soy growing geographies. Both companies have significant expertise in the use of molecular genetics and rapidly advancing new technology in the commercial breeding programs. During the past 5 years, each company has systematically initiated crosses in elite germplasm in MG 1 – MG V focusing on top yields and strong agronomics packages. Reported yields are equal to current commercial elite genetics. Both companies have indicated USB is leveraging 2-3X the value of the USB investment - the exact value is confidential.

Section C: SPECIAL CONSIDERATIONS (optional)
**Section A: PROPOSAL SUMMARY**

- Proposal supports the Oil Diversity Roadmap with particular focus on identifying fatty acid pathways for targeted fatty acids.
- Main deliverable will be non-transgenic constructs (derived from wild soybean, no foreign DNA) of enriched levels of desaturated linolenic fatty acid as a metabolic platform to produce desirable omega-3 constituents that are favorable for human health, and thereby offer a new use of soybean oil for human consumption.
- Soybean value is significantly enhanced as these applications represent new market opportunities for oil utilization.
- Addresses Oil Diversity Roadmap to initiate a high degree of innovation by developing new applications of modified oils that may open new market opportunities for soybean oil utilization.

**Section B. EVALUATION CRITERIA**

1: Strategic Importance

- Addresses LRSP in Oil/Sustainable Production to create innovation in oil composition that can be incorporated into commercial products by seed companies.
- Soybean oil at 12.5 Billion pounds for edible usage commands only about half of the edible/human oilseed market. New modified oil applications open up opportunities to capture greater market share.
- Like the high oleic strategy, when a new modified oil application comes online, partnerships with O&B, MSL-Group, and others help bring it to market.

2: Value Impact

- New modified oil applications open up new markets for soybean oil beyond the current edible oils usage of 12.5 Billion pounds, and greater usage creates greater demand and price for soybean and soy oil.
- Development of new modified oil will likely require considerable time and expense to achieve the high degree of innovation, yet the reward of establishing new market opportunities or increasing oil market share pays off over a long time.
- Introduction of a new modified oil could potentially add one Billion pounds to market share for soybean oil.

3: Execution Feasibility

- The proposed research is in its earliest phase, still requiring proof of concept, as is for all work on omega-3 manipulation in oilseeds.
- David Hildebrand (Univ. of Kentucky) has dedicated a long career to the understanding and manipulation of fatty acid metabolism and triglyceride synthesis and changing triglycerides of oilseeds, with emphasis on soybeans, for improved edible and industrial quality, and has built a lab and supporting personnel around this aim.
- His approach to developing omega-3 constructs is unique and different from the other proposed projects in this area.

**Section C: SPECIAL CONSIDERATIONS (optional)**

- The requested amount is minimal for the deliverable and research promised and thereby represents minimal investment, even for high risk research.
- This is a new project proposal.
Section A: PROPOSAL SUMMARY

- Proposal supports the Oil Diversity Roadmap with particular focus on identifying fatty acid pathways for targeted fatty acids.
- Main deliverable will be to develop a genetically engineered prototype for soybean that is potentially capable of producing desirable omega-3 constituents that are favorable for human health.
- To do so, a two-prong approach is proposed: Develop transgenic (derived from different organism) lines containing desaturase enzymes (lacking in soybean) and cross with soybean mutants that contain the precursors necessary to the enzyme activity to ultimately express for high enough levels of omega-3 constituents.
- Soybean value is significantly enhanced as new modified oil applications represent new market opportunities for oil utilization.
- Addresses Oil Diversity Roadmap to initiate a high degree of innovation by developing new applications of modified oils.

Section B: EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP in Oil/Sustainable Production to create innovation in oil composition that can be incorporated into commercial products by seed companies.
- Soybean oil at 12.5 Billion pounds for edible usage commands only about half of the edible/human oilseed market. New modified oil applications open up opportunities to capture greater market share.
- Like the high oleic strategy, when a new modified oil application comes online, partnerships with O&B, MSL-Group, and others help bring it to market.

2: Value Impact

- New modified oil applications open up new markets for soybean oil beyond the current edible oils usage of 12.5 Billion pounds, and greater usage creates greater demand and price for soybean and soy oil.
- Development of new modified oil will likely require considerable time and expense to achieve the high degree of innovation, yet the reward of establishing new market opportunities or increasing oil market share pays off for a long time thereafter.
- Introduction of new modified oil could potentially add one Billion pounds to market share for soybean oil.

3: Execution Feasibility

- The proposed research is in its earliest phase, still requiring proof of concept, as is for all work on omega-3 manipulation in oilseeds.
- Khalid Meksem career has focused on structural and functional genomics and has made strides in molecular dissection of plant resistance mechanisms of nematodes and pathogens. He has applied these developments in mutation breeding and generating alternative alleles in fatty acid research for soybean. Thus, he has a well-equipped lab and facility to approach the proposed challenge.
- This proposal represents yet another unique method to approach the challenge of developing novel modified oils in soybean.

Section C: SPECIAL CONSIDERATIONS (optional)

- The requested amount is relatively low for the type of deliverables and research promised and thereby represents minimal investment, even for high risk research.
Section A: PROPOSAL SUMMARY

- Proposal fulfills Oil-Supply Road Map to expand sources of genetic diversity of high oleic germplasm, in this case additional Group 0 to V varieties.
- As a private seed company Schillinger Genetics offers as main deliverable the development of high oleic/low linolenic (HOLL) soybean containing the Missouri non-transgenic high oleic trait incorporated into proprietary non-GM commercial varieties to answer the LRSP goal of achieving 11.71 million acres of high oleic soybean planted by 2021.
- Initial commercial release is expected in 2017 for Group II HOLL varieties. Funding is sought to accelerate development of HOLL varieties, even as many as 10 varieties in Maturity Groups 0 to V, for 2019 release that also contain high value meal traits such as low oligosaccharide, that increases value to soy meal as it appeals to animal nutritionists that can formulate rations with greater energy content and hence faster growth rate of poultry and swine.
- Varieties with combined high value oil and meal traits are a goal of LRSP to increase overall value. This represents a high degree of innovation.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goal in oil/sustainable production aimed at developing improved varieties for farmers, even for release beginning in 2017.
- Contributes to Oil-Supply LRSP goal of 11.71 M acres of high oleic soy planted by 2021.
- Fulfills Oil-Supply Road Map to expand sources of genetic diversity of high oleic germplasm such that a wide number of HOLL varieties can be made available to growers in all maturity groups, particularly those not currently emphasized by Pioneer or Monsanto, such a Group 0-1 or V.
- Schillinger Genetics varieties fill unique market needs in addition to the commodity market, upon providing high value traits (high protein and/or low oligosaccharide with HOLL) in elite non-GM varieties for markets demanding premium soybean meal such as aquaculture.

2: Value Impact

- Development of HOLL varieties contributes to the goal of making HOLL varieties available in all geographic areas, so all farmers can realize the premiums offered (roughly $0.50/bu).
- The greater the presence of HOLL in the market, the more opportunity to recoup the market share lost (5+ billion pounds) to trans-fat ban and labeling.
- Overall value of soybean goes up as value of the oil and meal is enhanced in the same variety.

3: Execution Feasibility

- The HOLL market is ripe and demanding more acres to satisfy incentive of end users to switch to soybean HOLL in filling large contracts. In addition, some markets favor non-GMO.
- The seed company Schillinger Genetics represents the first commercial application of the Missouri/public high oleic trait.
- Schillinger Genetics has immediate access to resources such as winter nursery and increased seed production to feasibly carry out an acceleration plan for variety release.

Section C: SPECIAL CONSIDERATIONS (optional)

- This is a new project.
Section A: PROPOSAL SUMMARY

- Proposal fulfills Oil-Supply Road Map to expand sources of genetic diversity of high oleic germplasm, in this case additional Group II and early III lines.
- The main deliverable of the proposal is to develop high oleic/low linolenic (HOLL) soybean lines and germplasm containing the Missouri non-transgenic high oleic trait that can be licensed to seed companies to produce commercial varieties to answer the LRSP goal of achieving 11.71 million acres of high oleic soybean planted by 2021.
- 1-2 non-GMO high oleic lines will be ready for release in 2019 through Zeeland Farm Services of Michigan.
- Proposal answers degree of innovation requested by the Board to develop lines ready for release or hand-off to the seed industry.
- The HOLL Group II-III varieties developed on this proposal at Michigan State University will also contain low saturates and targeted for the non-GM edible oil market.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goal in oil/sustainable production aimed at developing improved varieties for farmers.
- Fulfills Oil-Supply Road Map to expand sources of genetic diversity of high oleic germplasm such that a wider number of seed brands can be made available.
- Contributes to Oil-Supply LRSP goal of 11.71 M acres of high oleic soy planted by 2021.

2: Value Impact

- Development of HOLL varieties contributes to the goal of making HOLL varieties widely available so all farmers can realize the premiums (roughly $0.50/bu) offered.
- The greater the presence of HOLL in the market, the more opportunity to recoup the market share (5+ billion pounds) lost to trans-fat ban and labeling.
- Overall value of soybean goes up as value of the oil is enhanced.
- A ready-made market and cooperative seed increase plan is already in place to accept HOLL varieties developed this proposal, as Zeeland Farm Services is a major Michigan crusher that services the edible oil market and prefers non-GM low saturate soybeans.

3: Execution Feasibility

- The breeder (Wang) at Michigan State University has made significant progress over 4 years to develop HOLL varieties with the Missouri high oleic non-transgenic trait with ongoing Michigan Soybean Association support, yet seeks additional support to fill the sizeable demand for these HOLL varieties by Zeeland Farm Services.

Section C: SPECIAL CONSIDERATIONS (optional)

- This is a new project proposal.
Section A: PROPOSAL SUMMARY

With the focus of improving and capturing value in the LRSP, USB needs to jumpstart a value-chain-wide shift in how soybean meal and oil are evaluated, marketed and purchased. Crushers are our most influential value-chain partners. They understand the value of soybean components, but have yet to fully embrace the transparency it will take to realize USB’s long term vision for value capture. Therefore, this proposal works to build understanding among crushers regarding U.S. soy’s compositional challenges and opportunities. The effort will connect crushers with USB’s work on this issue throughout the entire value chain. This proposal will start the conversation about checkoff goals with crushers, identifying potential roadblocks and opportunities. A broad campaign focused on getting crushers, elevators, farmers and seed companies to think beyond the bushel complements this work with crushers on the path toward a value capture system for soybeans.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Movement toward a value capture system will require a value chain-wide shift in how soybean meal and oil are evaluated, marketed and purchased. USB must continue developing strong relationships with the crusher audience to advance the vision of additional value capture throughout the chain. Though change won’t happen in a single fiscal year, USB needs to continue to build understanding with crushers, and make them aware of all the soy checkoff’s activities across the value chain to find value capture opportunities. This effort is an early step in reaching the board’s 2021 milestone of crushers reporting protein and oil back to farmers.

Sharing the checkoff’s investment in building demand and value for soybeans to benefit the entire value chain with crushers will lay the foundation for industry-wide change in coming years that could increase profitability for every link in the value chain with transparent pricing based on component value.

2: Value Impact

To add value to the U.S. soybean market, we must engage each link of the chain through a common goal: competing in the global marketplace. Processors are the catalyst in the industry’s move to a value-capture system, such as a constituent pricing structure. Though there are only a few hundred crusher locations in the U.S., it is important that we identify the right contacts within each operation and communicate with them frequently to help move USB’s vision forward. Every part of the value chain must move together to preserve and grow our global market share for U.S. soybean oil and meal, and processors have the most influence on their suppliers and customers to set a transparent goal for soybean constituents.

3: Execution Feasibility

We know that a value capture system is not going to happen overnight. However, it is crucial to start conversations now with stakeholders, especially crushers, to realize USB’s objectives. Soybean processors are the lynch pin in the industry’s move to a value capture system. Grassroots outreach, targeted events and customized content will establish USB as a leader and resource as the industry makes incremental changes that allow every link in the value chain to capture value from U.S. soy’s quality as it continues to improve.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
PROPOSAL ON A PAGE

This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
**Section A: PROPOSAL SUMMARY**

This proposal focuses on the integrated crushers in China that have refining capabilities. According to anecdotal comments from overseas customers, U.S. soybean oil has a processing advantage for refiners compared to other soybean oil (SBO). Their examples include attributing a $10-15 per ton advantage to the refiner of U.S. SBO due to such quality characteristics as lower Free Fatty Acids and peroxide values. This proposal would fund trade relations activities (contractors, travel, trade meetings, etc.) to educate these entities about the refining advantages that U.S. soy oil has compared to soybean oil from other sources (crushed locally from imported whole beans). This proposal does not depend on any other proposal. However, it is similar in the intent of proposal # 1810-263-0434, but focuses instead on integrated crushers with refining capabilities (Obj E) rather than refiners (Obj H).

**Section B: EVALUATION CRITERIA**

1: Strategic Importance

Based on USDA statistics, China is U.S. soy's number one customer, accounting for 57 percent of every soybean grown in the U.S. In MY16, China imported 31.8 million metric tons of U.S. soybeans. Considering approximately 19 percent of every soybean is oil, which translates to 6.04 million metric tons of oil (13.32 billion lbs., 1166 bu.) In addition, China imported more than 57,000 metric tons of U.S. soybean oil (125.66 million lbs., 666,000 bu.), making it the fifth largest U.S. SBO export market. But the U.S. holds only 37 percent of the import market share in China for all soybean products, suggesting plenty of opportunity for growth (Source: USSEC Market Snapshots).

Through USB’s broader portfolio of activities, we typically target the top 10 crushers in China that collectively account for 68 percent of all soy the volume. USB has traditionally focused its market development efforts on demand for meal with oil being a secondary product. The priority has been to highlight the advantages of U.S. soybean meal. Considering that most of the major crushers are integrated operations, USB can promote the U.S. soy advantage by highlighting the refining advantages that U.S. soy has over soy from other origins. This proposal will help educate crushers with integrated refining capabilities about this advantage.

1: Strategic Importance

China remains the world’s largest soybean market, consuming an estimated 83 million metric tons of soybeans in 2017 (Source: USSEC Market Snapshots). Increasing market share in China by even one percent can translate to more than two hundred thousand dollars in increased sales for U.S. soybean growers. This proposal presents a novel approach in working with the refining businesses within China’s integrated crushers. If successful it will strengthen buyer preferences for using U.S. soy. While this won’t necessary advance constituent/component pricing per se, it should impact value perceptions and recognition of the refining advantages that can be achieve with U.S. soy versus other origins.

1: Strategic Importance

This proposal is not expected leverage any third-party contributions. Limited challenges or roadblocks in executing this activity are expected. That said, the regulatory environment could certainly shift and make USB’s work more difficult. Such efforts would be monitored and address through a separate proposal being submitted under the Market Access program in Sustainability Roadmap.

**Section C: SPECIAL CONSIDERATIONS (optional)**
Section A: PROPOSAL SUMMARY

U.S. soybean farmers need buyers to prefer U.S. soybean oil for more than just price and include the value of soybean composition, consistency, sustainability and innovation. The problem is that buyers are incentivized by price and want to fulfill end-user needs for the lowest cost. To get over this hurdle, USB needs to understand what it’s going to take for buyers to make purchase decisions based on U.S. soy’s advantages. First, USB needs to better understand what domestic buyers at oil refiners know about U.S. soy and the other motivations and influences that impact buyers’ decision processes. Through an in-depth focus-group research approach, the checkoff will be able to gain valuable insights on buyers and their executive leadership, so USB can then more effectively influence purchases, boosting soy’s value proposition. If buyers perceive U.S. soy as a solution for their needs, demand for U.S. soy will increase.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Domestic buyers at oil refiners are a critical audience for USB because they represent soy’s value to end users. Currently, buyers aren’t focused on value. They are focused on price. To effectively make change with this audience, USB needs to better understand the audience and their motivations, but more importantly, the knowledge, attitudes and motivations of their executive leadership. The proposed market research will deliver insights to help guide USB’s efforts in the future to achieve its value goal and U.S. soy’s value proposition.

2: Value Impact

In the marketplace, USB is working with several value chain partners to create and capture value for enhanced soybean varieties, including high oleic varieties. These added-value varieties deliver what end users want — whether that’s increased functionality or performance — sustainably. While all of these benefits meet end-user demands, USB needs to encourage the link in the value chain between crushers and end users, who are buyers, that they should recognize and properly value these benefits. Benefits for the high oleic varieties specifically are captured, but other benefits to buyers of U.S. soybean oil — including composition, consistency, sustainability and innovation — are not being valued. A procurement process based on better products will deliver better products — which benefits everyone from the soybean farmer to the end user.

3: Execution Feasibility

To learn insights about domestic buyers at oil refiners and their executive leadership, USB can leverage its soy industry connections to identify and conduct marketing research with these contacts, and explain that their feedback will be instrumental in helping to increase the value of U.S. soy, which is a benefit to buyer organizations, their customers (end users) and everyone else in the value chain. The checkoff will engage a trained marketing research strategist for this portion of the proposal to ensure it is executed appropriately.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
The food industry is looking for functional, high stability oils with a favorable nutrition profile to meet their needs, and the soybean industry has two key innovative opportunities to meet these needs – high oleic soybean oil and enzymatically interesterified soybean oil. As USB looks to increase demand for these value-add products, this proposal will engage an additional partner, QSSBs, in that effort. For USB to maximize opportunities to connect with these end users, this proposal provides end user outreach tools and opportunities, including advertisements, to QSSBs. By arming QSSBs with the information that they need to promote soybean oil solutions, this proposal will create consistency in shared resources for U.S. soy. Additionally QSSBs have a diverse network that can help accelerate demand for high oleic and interesterified soybean oil.

Section C: SPECIAL CONSIDERATIONS (optional)

The food industry is looking for functional, high stability oils with a favorable nutrition profile to meet their needs, and the soybean industry has two key innovative opportunities to meet these needs – high oleic soybean oil and enzymatically interesterified soybean oil. As USB looks to increase demand for these value-add products, this proposal will engage an additional partner, QSSBs, in that effort. For USB to maximize opportunities to connect with these end users, this proposal provides end user outreach tools and opportunities, including advertisements, to QSSBs. By arming QSSBs with the information that they need to promote soybean oil solutions, this proposal will create consistency in shared resources for U.S. soy. Additionally QSSBs have a diverse network that can help accelerate demand for high oleic and interesterified soybean oil.
Section A: PROPOSAL SUMMARY
QUALISOY's unique position as an industry forum for soy value chain thought-leaders and its focus on high oleic soybean oil adoption, component value determination, reduced carbohydrate soybeans for meal, and enhanced nutritional energy meal makes it a key market outreach tool with the Value Chain to build the strategy for improving U.S. soy competitiveness and combating market barriers. This POP covers two activities, Activity A & Activity B and is complementary with other proposals in Supply and Demand. This proposal will aid in the capture of 3 billion pounds (272 million bushels) of market share by 2022 through strategic partnerships/collaboration with industry leaders throughout the Soy Value Chain that will drive the creation/expansion of high oleic soybean (HOS) programs with crushers/refiners and the adoption of high oleic soybean oil throughout the food industry. The second part of this POP will execute this strategy by instilling oil buyers and sales desks with greater interest, knowledge and confidence in the U.S. Soy Advantage and soybean oil solutions, resulting in expanded soy programs and increased soybean oil usage by their customers. The degree of innovativeness requested by Directors is moderate (new but familiar market or solution).

Section B. EVALUATION CRITERIA

1: Strategic Importance
The successful completion of this proposal will positively impact advancing the United Soybean Board's (USB) strategic goals, multi-year roadmaps, and objectives by:
- Providing a unique forum (QUALISOY) for industry leaders to converge and direct a strategy to combat U.S. soy market barriers such as trans-fat labeling, revoking GRAS (generally recognized as safe) status of PHOs (partially hydrogenated oils), competitive feed stocks both domestic and international, supply/demand swings, etc., while driving expansion of U.S. soy programs and adoption of HOSO – and still maintain a competitive position.
- Providing a unique forum for soybean industry leaders to evaluate enhanced trait soybeans and organize successful commercialization
- Broadening USBs industry partnerships through Industry Advisors from various soybean market sectors who will participate in QUALISOY working groups
- Building the economic case for crushers, refiners, brokers and processors to advance efforts to influence demand and supply for HOSoy by keeping them apprised of the agronomics, latest developments and new technologies that influence their purchasing decisions
- Building confidence along the soybean value chain to expand acreage and processing capabilities to meet the growing demand for soybean oil solutions, particularly for high oleic and enzymatically interesterified (EIE) soybean oil products through one-on-one meetings, interaction at tradeshows, trainings and dissemination of educational tools.
- Creating new windows of opportunity for USB through events at which QUALISOY will directly engage with USB’s target audiences throughout the year
- Communicating assurances that soybean oil products for the bakery market and high oleic soy for foodservice, along with other soy solutions, will be available in sufficient quantities and have a reliable supply at a competitive cost

2: Value Impact
This proposal creates strong value for U.S. soy growers by:
- Increasing the value of high oleic and interesterified oil for the entire soybean value chain. For example, QUALISOY estimates that soybean producers alone will enjoy approximately $1.5 billion per year upon successful commercialization of high oleic and interesterified soybean oil by 2026. This assumes that 6 billion lbs. (545.5 million bushels) of high oleic soybean oil is used in edible applications in North America and another 3.3 billion lbs. (300 million bushels) or its equivalent is used in industrial applications in North America, exported off shore as oil or exported off shore as beans.
- Advancing constitutent pricing through QUALISOY working groups focused on 1. driving the development and availability of soybeans with enhanced quality traits to the market. Initially, the ENEM and RCS products 2. converting the industry from trading based on pounds of soybeans to trading based on the value of constituents in each bushel.
- Educating buyers about the latest developments and technology releases of new and improved soy products (differentiating of U.S. soy) to further strengthen the case to purchase based on the U.S. Soy Advantage, which will drive purchase and adoption of U.S. soy market offerings
- Creating such a strong awareness with buyers about the entire portfolio of soy solutions that they can articulate the advantages they offer within the processor/refiner organizations as well as to downstream customers
- Building the market demand for U.S. soybean oil solutions by conducting and communicating market research and analysis, reducing and/or eliminating competitive advantage of other oilseeds

3: Execution Feasibility
No technical, market or implementation/adoption challenges are identified for this proposal. QUALISOY will maintain and expand its industry partnerships and will leverage these existing relationships along with networking opportunities provided by tradeshows to ensure events are executed for maximum impact while also collecting food industry contact information and ensuring valuable insights are captured from quality industry contacts at these events. Professional staff will work collaboratively with long-time USB/QUALISOY economic and market experts to ensure consistency in communications of data across the value chain. A third-party market research vendor will conduct research to measure project impact. No financial commitment by 3rd party partners is requested as part of this proposal and all partners are extremely capable of successfully executing the projects included in this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

Section A: PROPOSAL SUMMARY

This POP is designed to support the Value of Soybean Constituents Roadmap with specific focus on the FY18 Market Outreach Track, Stage 2, “Assess how value can be shared across the value chain”. This project has 3 distinct elements: 1) Direct engagement with crushing/refining industry to influence their acceptance of the USB goals of capturing value from improved constituents; 2) Monitoring the industry, vegetable oil prices, USDA reports, biofuel trends and news and food industry trends and news; and 3) Analyzing this input with respect to the USB goal of capturing value from improved traits and reporting the analysis to primary contractors and subcontractor colleagues thus empowering them to influence industry acceptance. While the crushing/refining industry employs procurement methods and marketing methods perfected and used well over a century, designed to handle high volumes of commodities and process at low costs, EPV data produced by USB has demonstrated that increased value per bushel can be obtained converting to a constituent pricing system that benefits the entire soy value chain.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Intense engagement with commercial management in the crushing industry and sales desks and sales management among refiners is essential to achieving industry investment in methods of identity preservation of soybeans with new and improved composition traits so that the value of these traits can be captured throughout the value chain. In depth knowledge of the industry, both structurally and regarding immediate challenges and opportunities it faces, is a necessary element in knowing how to approach changes in this rigid marketing system and how to convince the industry to adopt different attitudes. Likewise, knowledgeable and frequent contact with industry to communicate the USB LRSP, strategies and goals and to understand industry’s and industry participants’ goals is necessary for any chance of success in achieving the objective of crushers committing to invest in methods of identity preservation of soybeans with new and improved composition traits so that the value of these traits can be captured throughout the value chain.

2: Value Impact

Data produced by USB has shown that the Estimated Process Value of soybeans within a given geographic growing area varies by over $1 per bushel in some cases. Both short term strategies of knowledgeable varietal selection and long term solutions such as breeder focus on quality as well as yield are necessary to leverage the benefits of this trend. This proposal also provides a focal point of industry engagement between this contractor and industry leaders to maintain communications between USB and industry and to influence crusher/refiner behavior. Additional value is documented from the successful commercialization of high oleic soybean oil. QUALISOY, with considerable industry input, has estimated that high oleic success translates into annual revenue enhancements for soybean farmers of $1.497 billion upon achieving the maximum volume produced. In addition, this proposal empowers USB and subcontractors in their interaction with the industry to make a meaningful impact through Contractor’s dissemination of information and analysis of the industry to them.

3: Execution Feasibility

Contractor is uniquely qualified for this engagement, having served in the industry positions with which he will be engaged and having established relationships with most already. This is due to his 40 plus years of experience working in merchandising and executive positions in the crushing/refining industry and consulting on behalf of participants in this industry. He has also been instrumental in the work of USB regarding soybean composition and trait enhancements.

Section C: SPECIAL CONSIDERATIONS (optional)
This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Section A: PROPOSAL SUMMARY

This proposal is designed to support the Value of Soybean Constituents Roadmap, with specific focus on the FY18 Market Outreach Track, Stage 3, “Build insight-based messaging solutions that break through and give form to the strategy”. The Soybean Quality Data and Assessment Program (1830-262-0419) is part of the critical path to address LRSP Oil Objective C and F, where elevators and crushers will be able to measure soybean composition at the first point of sale, such that constituent/component pricing can be adopted. This proposal merges the activities of the following three projects from FY17: U.S. Soybean Quality Data Integration, Analysis, Outreach, and Engagement; the Soybean Export Quality Survey; and Value Chain Analysis Model Enhancement and Support. The three key elements forming the foundation for this project are obtaining relevant soybean industry data including results from a survey of quality of soybean exports; developing the tools used to perform the economic/value-based analysis; and communicating the insights gained during the process. Successful completion of these elements will provide USB with fact-based insights and analytical tools that allow to take a leadership role in facilitating strategic industry discussions about enhancing the U.S. Soy Advantage.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Two emerging sources are threatening the competitiveness of U.S. soybeans: international competition, and competing sources of protein feed ingredients and edible oils (i.e. synthetic amino acids, DDGS, high protein canola and other vegetable oils). If these threats are not adequately addressed, the U.S. soybean industry is at risk of losing domestic and international market share. While continual improvement of U.S. soybean composition/value can help keep soybeans competitive in the face of these potential threats, farmers lack the incentive to improve soybean compositional quality at the farm-level as soybean prices are determined in part on regional average quality. To improve, strategic partnerships must be forged to effectively align market signals in a way that motivates seed companies and farmers to focus on improving the compositional quality of U.S. soybeans. Successful completion of this proposal will provide the data, analysis, and insight-based messaging about the value of soybean constituents and the variability of soybean composition. USB will be able to leverage the outputs from this proposal to determine and refine strategies for enhancing soybean value and engage the broader marketplace about capturing these value opportunities.

2: Value Impact

Centrec analysis of protein and oil data from across an area in the U.S. shows that the range in estimated processed value (EPV) per bushel of soybeans coming from a single region in a single year can vary between $0.38 to $1.53. If the composition of all U.S. soybeans was improved so the average EPV in each region increases anywhere between 20 to 80 cents per bushel (a conservative portion of the existing variance), then the total value of the U.S. crop could potentially increase between $0.9 to $3.4 billion annually. Given the value potential of increasing protein and oil, there is an opportunity to understand the underlying causes of these differences and manage to produce higher value soybeans. A critical capability to enable such strategies is to be able to measure and report the compositional value of the soybeans back to farmers. The underlying objectives of this proposal are to collect and analyze data to quantify the potential value of improving soybean quality and to develop insight-based messaging for industry communication purposes. Using the outputs of this project, strategies and partnerships can be developed to capture the value created by improving soybean composition. For example, the outputs of the Value Chain Analysis (VCA) model, which is maintained under this program, created the economic justification necessary for USB to engage industry participants and pursue the development and adoption of high oleic soybean oil. In addition to evaluating potential value-enhancement opportunities, the insight-based messaging developed by this proposal will continue to quantify the potential of advancing the constituent-based pricing strategy. For example, the Soybean Quality InfoBase, which is updated annually under this program, contains an immense amount of data used to study the variability of soybean composition and consistency of soybean variety performance.

3: Execution Feasibility

The successful execution of this proposal is highly likely due to Centrec’s past experience and team qualifications. The Centrec project team has deep and detailed experience in data collection, analytical model development, and quality data analysis. Centrec also has established an extensive network of contacts across the soybean industry and within various governmental agencies and USB. These contacts will be leveraged to identify and get feedback on relevant data to collect, developing questions that warrant investigation, and insights gathered from analyses performed during this proposal.
Section A: PROPOSAL SUMMARY

This proposal is intended to support the Value of Soybean Constituents Road Map, with specific focus on the FY18 Market Outreach Track, Stage 3, "Build insight-based messaging solutions that break through and give form to the strategy."

Constituent pricing (CP) and other value enhanced opportunities (VEOs) identified by USB have the potential for creating significant value across the U.S. soybean industry. However, the complexity of the soybean value chain and the technological tradeoffs between the VEOs and soybean co-product yields creates challenges for assessing where value would be created across the value chain, and the relative economic benefits of CP and/or different VEOs. Assessing the value creation and economic implications requires a multifaceted analytical model that captures the multiple economic and biological relationships, and contemporary soybean market dynamics. This proposal will engage industry stakeholders and utilize economic theory to develop the conceptual framework and design for an analytical model. This model will measure value creation and economic benefits of different VEOs, including CP, across the soybean value chain.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Two emerging sources are threatening the competitiveness of U.S. soybeans: international competition, and competing sources of protein feed ingredients and edible oils (i.e. synthetic amino acids, DDGS, high protein canola and other vegetable oils). If these threats are not adequately addressed, the U.S. soybean industry is at risk of losing domestic and international market share. Capturing additional value across the U.S. soybean supply chain is a LRSP goal that will enable core value chain partners to preserve and grow the market share of U.S.-produced soybeans. To help the core value chain partners make optimal strategic decisions for the industry and its stakeholders in determining how value from various VEOs could be realized across the value chain, the individual market components need to be understood. The Value Chain Analysis (VCA) model, maintained under a different proposal, has adequately assessed previous demand-focused opportunities. However, the new VEOs, including CP, present new technological situations and supply and demand opportunities, and therefore, market complexities that cannot be fully measured in the existing VCA model or other existing models. This program will leverage off of the existing VCA model to design a more sophisticated analytical model. The design of the value assessment model developed in this proposal can then be used to build the model in a subsequently funded project. Ultimately, the value assessment model will measure where and how the value could be created and the overall economic benefits of the different VEOs can be shared across the soybean value chain. As a result, the model's output will provide economic estimates of the value created from different VEOs, and combined with stakeholder input, will help the U.S. soybean industry with assessing opportunities for advancing USB's strategic goals and the U.S. Soy Advantage.

2: Value Impact

Centrec analysis of protein and oil data from across an area in the U.S. shows that the range in estimated processed value (EPV) per bushel of soybeans coming from a single region in a single year can vary between $0.38 to $1.53. If the composition of all U.S. soybeans was improved so the average EPV in each region increases anywhere between 20 to 80 cents per bushel (a conservative portion of the existing variance), then the total value of the U.S. crop could potentially increase between $0.9 to $3.4 billion annually. Given the value potential of increasing protein and oil, there is an opportunity to understand the underlying causes of these differences and manage to produce higher value soybeans. The new VEOs provide greater opportunities for creating additional value for U.S. soybean farmers, along with other industry stakeholders. The value assessment model, designed in this project, will be a tool for the industry to understand where and how the value will be created across the soybean value chain and the overall economic impact of the new VEOs, including CP. Examples of potential realized value from specific VEOs include increased value of soybean meal value ($/T) to a livestock feeder, higher value of soybeans for a soybean merchandiser ($/bu), and increased value of soybeans for a farmer ($/bu). Understanding how the additional value could be captured across the value chain and the overall economic impact will help U.S. soybean growers and other industry stakeholders make optimal strategic decisions.

3: Execution Feasibility

Centrec recognizes USB's strategic priorities, the need for measuring how additional value is realized across the soybean value chain, and the challenges in assessing the economic benefits of different VEOs. As a result, this proposal will leverage off of Centrec's institutional knowledge of the U.S. soybean industry, experience with USB in developing its strategies, economic knowledge base, and empirical models to begin the process of empirically evaluating the economic benefits of various VEOs. In addition, Centrec has developed various empirical models on behalf of USB that may be appropriate for parts of the valuation model framework. The most relevant model is the VCA model, which has been used for over 15 years. Centrec led the development effort for the VCA model, which included working with economists with expertise in this area and engaging industry stakeholders to develop a model based on sound economic theory and that captured the soybean industry market dynamics accurately. This program will leverage off of existing Centrec models to reduce development time and cost, and take advantage of methodologies that have been accepted by USB and the industry for many years.

Section C: SPECIAL CONSIDERATIONS (optional)

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This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Soybean oil usage has dropped from 78% to 51% of the domestic 25-billion-pound edible oil market due to trans-fat issue, but market share can be maintained and expanded with adoption of alternative processing methods that utilize commodity soy oil. This proposal solves a problem/satisfies an unmet need for the food industry by providing a soybean oil solution. Par fryers have been searching for a suitable replacement that resolves issues including off flavors, liquid oils weeping into the packaging, and fries sticking together after freezing. United Soybean Board (USB) data suggests that shortening made with conventional soybean oil, fully hydrogenated soybean oil and high oleic soybean oil (HOSoy) will prove most effective in solving these issues. This proposal partners USB with Stratas foods to conduct lab tests resulting in new data that will prompt production by refiners and adoption by the three primary par fryers – Simplot, Lamb Weston (Conagra) and McCain. The level of innovativeness requested by directors was moderate (new but familiar market or solution). This proposal is not interdependent, but is complementary to proposals in Demand that further demonstrate soybean oil's portfolio of solutions for nearly every application in the food industry.
PROPOSAL ON A PAGE

Section A: PROPOSAL SUMMARY

The U.S. soy industry has lost 4 billion pounds of soybean oil market share annually since trans-fat labeling was enacted due to health concerns. 12 billion pounds of soybean oil is consumed domestically, however competition and market barriers, including health misperceptions, will continue to threaten its share if not addressed. This POP is comprised of two complementary Market Outreach activities that protect and expand the use of commodity soybean oil (Activity A - Marketplace Advantages of Soybean Oil and Activity B - Food & Nutrition Strategic Stakeholders and Advisors and). Activity A - seeks to instill oil refiners Buyers and sales desk audiences to produce a dependable supply of partially hydrogenated oil (PHO) free ingredients to replace the estimated 1 – 1.5 billion pounds (91-136 million bushels) of PHOs that remain in the food supply. Activity B - includes the Soy Nutrition Institute which leverages the soy value chain scientific and nutrition community to work together to address issues relating to soy and human consumption. The degree of innovativeness requested by Directors is moderate (new but familiar market or solution). These activities address the food industry with solutions to encouraging the usage of soybean oil while overcoming barriers that may discourage its use. This proposal is not interdependent of other proposals.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The successful completion of this proposal will positively impact the 12-billion-pound domestic market for soy advancing the United Soybean Board’s (USB) strategic goals, multi-year roadmaps, and objectives by:
- Building the economic case for crushers, refiners, brokers and processors to advance efforts to influence demand and supply for commodity soybean oil by keeping them apprised of the agronomics, latest developments and new technologies that influence their purchasing decisions
- Meeting objectives of soybean farmers outlined in the Long Range Strategic Plan by strengthening the soy value chain’s understanding of the advantages of a U.S.-grown soy portfolio and bringing that value back to farmers by reclaiming market share.
- Building confidence along the soybean value chain to expand processing capabilities to meet the growing demand for soybean oil solutions, particularly for enzymatically interesterified (EIE) soybean oil products through one-on-one meetings, research, interaction at tradeshows and trainings.
- Communicating assurances that soybean oil products for the bakery market and high oleic soy for foodservice, along with other soy solutions, will be available in sufficient quantities and have a reliable supply at a competitive price.

It also strategically aligns USB with multi-stakeholder groups in the food & nutrition market (Including the Soy Nutrition Institute and American Heart Association) that have been effective dealing with issues and barriers relating to soy consumption and human health. These groups provide information requested by the Food & Drug Administration when assessing health claims and have had success maintaining the FDA’s soy heart health claim. USB has a unique leadership ability to bring the soy value chain together, and these groups influence the market by promoting the benefits of consuming U.S.-grown soy and soybean oil.

2: Value Impact

These efforts create strong value for U.S. soy growers by protecting and expanding the soy market share of the 25-Billion-pound domestic edible oil market. Currently domestic consumption of soy is 12.5 billion pounds (USDA data).
- Capitalizing on the timing of the requirement to eliminate Partially Hydrogenated Oils (PHO) from the food supply by positioning the entire portfolio of soy solutions as replacement ingredients for the estimated 1-1.5 billion pounds (91-136 million bushels) of PHOs that remain in the food supply - Leveraging years of USB funded research proving the superior functionality and end user demand for both U.S.-grown conventional- and HOSO as a point of differentiation highlighting the value of the U.S. Soy Advantage to the sales desk / buyer audience.
- Leveraging years of established QUALISOY relationships with the sales desk/buyer (Oil Refiner) audience to provide targeted education, such as hands-on training, video education, expert insights and research to help them understand the benefits and sell an all-soy portfolio of products to end users.
- Creating such a strong awareness with buyers about the entire portfolio of U.S.-grown soy solutions that they can articulate the advantages they offer within the processor/refiner organizations as well as to End Users.
- Leveraging the power of influential multi-stakeholder groups to help support soybean oil consumption.

3: Execution Feasibility

No technical, market or implementation/adoptions challenges are identified for this proposal. Our team and QUALISOY will leverage existing relationships and networking opportunities provided by tradeshows to ensure events are executed for maximum impact, while also collecting food industry contact information and ensuring valuable insights are captured from quality industry contacts at these events. We will work collaboratively with highly experienced USB/QUALISOY economic and market experts to ensure consistency in communications of data across the value chain.

Four USB Directors serve on the board of the Soy Nutrition Institute to ensure it carries out USB’s goals and objectives.

No financial commitment by 3rd party partners is requested as part of this proposal and all partners are extremely capable of successfully executing the projects included in this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)

Our Commodity and High Oleic oil activities, while independent of one another, leverage partnerships/industry relationships resulting in program efficiencies
Section A: PROPOSAL SUMMARY

QUALISOY's unique position as an industry forum for soy value chain thought-leaders and its focus on high oleic soybean oil adoption, component value determination, reduced carbohydrate soybeans for meal, and enhanced nutritional energy meal makes it a key market outreach tool with the Value Chain to build the strategy for improving U.S. soy competitiveness and combating market barriers. This POP covers two activities, Activity A & Activity B and is complimentary with other proposals in Supply and Demand. This proposal will aid in the capture of 3 billion pounds (272 million bushels) of market share by 2022 through strategic partnerships/collaboration with industry leaders throughout the Soy Value Chain that will drive the creation/expansion of high oleic soybean (HOS) programs with crushers/refiners and the adoption of high oleic soybean oil throughout the food industry. The second part of this POP will execute this strategy by instilling oil buyers and sales desks with greater interest, knowledge and confidence in the U.S. Soy Advantage and soybean oil solutions, resulting in expanded soy programs and increased soybean oil usage by their customers. The degree of innovativeness requested by Directors is moderate (new but familiar market or solution).

Section B. EVALUATION CRITERIA

1: Strategic Importance

The successful completion of this proposal will positively impact advancing the United Soybean Board's (USB) strategic goals, multi-year roadmaps, and objectives by:

- Providing a unique forum (QUALISOY) for industry leaders to converge and direct a strategy to combat U.S. soy market barriers such as trans-fat labeling, revoking GRAS (generally recognized as safe) status of PHOs (partially hydrogenated oils), competitive feed stocks both domestic and international, supply/demand swings, etc., while driving expansion of U.S. soy programs and adoption of HOSO – and still maintain a competitive position.
- Providing a unique forum for soybean industry leaders to evaluate enhanced trait soybeans and organize successful commercialization
- Broadening USB/QUALISOY industry partnerships through Industry Advisors from various soybean market sectors who will participate in QUALISOY working groups
- Building the economic case for crushers, refiners, brokers and processors to advance efforts to influence demand and supply for HOSoy by keeping them apprised of the agronomics, latest developments and new technologies that influence their purchasing decisions
- Building confidence along the soybean value chain to expand acreage and processing capabilities to meet the growing demand for soybean oil solutions, particularly for high oleic and enzymatically interesterified (EIE) soybean oil products through one-on-one meetings, interaction at tradeshows, trainings and dissemination of educational tools.
- Creating new windows of opportunity for USB through events at which QUALISOY will directly engage with USB’s target audiences throughout the year
- Communicating assurances that soybean oil products for the bakery market and high oleic soy for foodservice, along with other soy solutions, will be available in sufficient quantities and have a reliable supply at a competitive cost

2: Value Impact

This proposal creates strong value for U.S. soy growers by:

- Increasing the value of high oleic and interesterified oil for the entire soybean value chain. For example, QUALISOY estimates that soybean producers alone will enjoy approximately $1.5 billion per year upon successful commercialization of high oleic and interesterified soybean oil by 2026. This assumes that 6 billion lbs. (545.5 million bushels) of high oleic soybean oil is used in edible applications in North America and another 3.3 billion lbs. (300 million bushels) or its equivalent is used in industrial applications in North America, exported off shore as oil or exported off shore as beans.
- Advancing constituent pricing through QUALISOY working groups focused on 1. driving the development and availability of soybeans with enhanced quality traits to the market. Initially, the ENEM and RCS products 2. converting the industry from trading based on pounds of soybeans to trading based on the value of constituents in each bushel.
- Educating buyers about the latest developments and technology releases of new and improved soy products (differentiating of U.S. soy) to further strengthen the case to purchase based on the U.S. Soy Advantage, which will drive purchase and adoption of U.S. soy market offerings
- Creating such a strong awareness with buyers about the entire portfolio of soy solutions that they can articulate the advantages they offer within the processor/refiner organizations as well as to downstream customers
- Building the market demand for U.S. soybean oil solutions by conducting and communicating market research and analysis, reducing and/or eliminating competitive advantage of other oilseeds

3: Execution Feasibility

No technical, market or implementation/adoptions challenges are identified for this proposal. QUALISOY will maintain and expand its industry partnerships and will leverage these existing relationships along with networking opportunities provided by tradeshows to ensure events are executed for maximum impact while also collecting food industry contact information and ensuring valuable insights are captured from quality industry contacts at these events. Professional staff will work collaboratively with long-time USB/QUALISOY economic and market experts to ensure consistency in communications of data across the value chain. A third-party market research vendor will conduct research to measure project impact. No financial commitment by 3rd party partners is requested as part of this proposal and all partners are extremely capable of successfully executing the projects included in this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Value Goal and the Value of Soybean Constituents Roadmap, with specific emphasis on the FY18 Market Outreach Track, Market Outreach Stage 2 - “Discovery Stage - Confirm the target landscape & define the strategic approach to influence behavior”. This proposal will focus on implementing pilot programs at elevators to measure and report the value of soybeans delivered by farmers based on their constituents. Crusher and elevator representatives will be engaged to monitor progress and provide guidance towards the development of standards for collecting, analyzing and reporting results to farmers. As a result of these experiences and analysis of the data, the incremental value potential from successfully improving soybean value will be estimated to determine if the potential gains exceed the costs. Increased transparency and broader measurement technology adoption across the value chain is critical to a successful constituent pricing system. This project builds on two current projects, the Crusher/Elevator Industry Consortium and the Elevator Pilot.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Two emerging sources are threatening the competitiveness of U.S. soybeans: international competition, and competing sources of protein feed ingredients and edible oils (i.e. synthetic amino acids, DDGS, high protein canola and other vegetable oils). If these threats are not adequately addressed, the U.S. soybean industry is at risk of losing domestic and international market share. Understanding the mechanics of different steps in establishing a transparent constituent value system through first-hand experiences will empower USB to take a credible leadership role in promoting broad-based adoption of quality measurement and farmer reporting at the first point of delivery. The adoption of constituent value pricing programs will require sampling of soybeans from farmers at their first point of delivery on a very broad scale. Even though this will require extra process steps and costs, it is strategically important in that it will provide information that will ultimately allow farmers to understand this value differential and empower them to demand better quality constituents in the soybean seed they buy. In addition, the experience gained through this project will provide elevators with both the ability and incentive to maintain value as the soybeans move through their system. This project will result in a better understanding of these trade-offs by putting the processes in place to allow elevators to learn what is involved in collecting, testing, and evaluating soybean samples from farmer deliveries. The resulting data will be compiled, analyzed and presented to the elevators and farmers to learn how they can assimilate that information into their decision making.

2: Value Impact

Centrec analysis of protein and oil data from across an area in the U.S. shows that the range in estimated processed value (EPV) per bushel of soybeans coming from a single region in a single year can vary between $0.38 to $1.53. If the composition of all U.S. soybeans was improved so the average EPV in each region increases anywhere between 20 to 80 cents per bushel (a conservative portion of the existing variance), then the total value of the U.S. crop could potentially increase between $0.9 to $3.4 billion annually. Given the value potential of increasing protein and oil, there is an opportunity to understand the underlying causes of these differences and manage to produce higher value soybeans. A critical capability to enable such strategies is to be able to measure and report the compositional value of the soybeans back to farmers. The investment into this proposal provides a “kick start” to creating an economic incentive for the entire value chain by quantitatively measuring the differences and gaining insights on how we can make the sampling and testing process more efficient while also providing data that can be used to understand the value potential. Adopting these programs will ultimately provide feedback to farmers about the value of beans that they are producing which will enable farmers to send appropriate market signals to the seed companies that will motivate them to provide seeds with higher quality and value. In addition to these incremental value improvements, the enhanced composition soybean traits recommended by USB’s Value Task Force will require similar capabilities and protocols to facilitate their trade in the market. Raising the overall quality/value of U.S. soybeans will have a positive impact on prices and directly support enhancement of the U.S. soy advantage.

3: Execution Feasibility

Technical challenges are minimal as the measurement and analytical processes are not new, they just have not been applied as broadly as needed. Getting elevators to commit to participate has been a challenge in the past since they do not currently perceive any tangible value. However, based on previous efforts, there are “early adopter” elevators who are willing to invest some time and energy to understand the possibilities. The main market challenge of this effort is that the short-term incremental gains from improving quality/value are relatively small, so there are not sizeable incremental margins available to drive broad and rapid change. However, solid data coupled with effective messaging campaigns have promise in changing attitudes and willingness to participate. The Centrec project team has decades of experience in working with elevators and others to collect, test, and model/analyze quality data and translate results into tangible market value. Team members have deep experience and key relationships with individuals in the grain industry including origination, handling, processing and marketing that allow them to evaluate results in the context of real-world constraints.

Section C: SPECIAL CONSIDERATIONS (optional)
## Section A: PROPOSAL SUMMARY

- Proposal addresses the Value of Soybean Constituents Road Map by demonstrating to grain buyers an opportunity and need for constituent pricing.
- Main deliverable is a data summary containing current status of protein and oil content and yield performance of nearly 2,000 commercial variety entries to be tested in 2018 in 24,000 mini-strip trials on 140 farms in 35 testing regions representing multiple environments for each variety.
- Traditionally, FIRST Trial results provide an independent source of data that provides farmers (via their QSSB) variety recommendations for their area based largely on yield; Results will now also be used to make recommendations on protein and oil content e.g. highlight high performing varieties with at least 1% or higher-than-average protein content (based on county average).
- Results will be communicated to farmers, seed companies, and grain buyers to create a greater preference for high yield and higher-than-average protein content.
- Planting higher protein varieties can raise overall protein content that raises demand upon creating preference for U.S. soy in feed rations and for export.

## Section B: EVALUATION CRITERIA

### 1: Strategic Importance

- Addresses LRSP goals in Marketplace to educate and partner with influencers in the value chain to recognize and promote the advantage of U.S. soy.
- Addresses goal of Value of Soybean Constituents Road Map to incentivize implementation of Constituent Pricing by working with seed companies, farmers, and grain buyers to recognize and create preference for growing high yield varieties that also contain higher-than-average constituents of protein and/or oil content.
- FIRST Trials represent large majority of soybean acres and thus the results and subsequent promotion of soy quality will impact much of soybean market.
- Project helps drive adoption of higher quality soybeans by creating interest and demand at grassroots level i.e. farmers, seed company reps, grain buyers in a region or even at county level.
- QSSBs (that receive data summary) have prime opportunity to further promote adoption of elite varieties with high quality, such as Illinois Soy’s HY+Q program.

### 2: Value Impact

- Variety choices based on both yield and quality represent a new paradigm for farmers, who welcome the opportunity if provided with solid recommendations and data pertinent to their area and environment, which is what this project will provide to enable this paradigm shift.
- Grain buyers take notice and become involved as interaction and communication occurs from farmers and seed company reps that plant and promote respectively the high yielding plus high quality varieties, as grain buyers are being compensated for constituents, protein and oil.
- Ideally, as grain buyers are better compensated due to an increase in higher quality coming in, the more likely they may be willing to share the increased profit per load by initially offering premiums and ultimately offer constituent pricing.

### 3: Execution Feasibility

- FIRST Trials have been operating for many years and results have high credibility with local farmers, seed companies, and grain buyers, and are certainly up to the technical challenge of providing reliable data on yield and quality.
- Seed company heavily leverage ($853,200) FIRST Trials as they depend significantly upon results to make variety recommendations, so seed companies are a ready audience to participate in effort to also promote quality.
- Market challenge will be for partners (farmers and their QSSBs, seed companies) to communicate and work together and to involve grain buyers and ultimately convince processors to offer premiums and constituent pricing.
- Underlying challenge will be creating incentive for seed companies to develop varieties with improved quality traits, to in turn, provide varieties that show an advantage in the FIRST Trials.

## Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support the Value of Soybean Constituents Roadmap, with specific focus on the FY18 Market Outreach Track, Stage 2, “Assess how value can be shared across value chain”. This POP combines 2 Activities – Activity A - Market View Database Website Interface Enhancement and Activity B - Market View Database Data Update), both of which are interdependent and are part of the critical path to address the LRSP Oil Objective A that Sales Desk will be able to accurately and consistently define the US Soy Advantage.

This proposal delivers a website containing two unique resources: (1) U.S. and international supply and disappearance data for soybeans, soybean oil, and soybean meal; and (2) briefings containing data-based insights about current issues impacting competitiveness of U.S. soybeans and its coproducts in the global market. These resources will provide verifiable facts that can assist U.S. soybean industry stakeholders in developing and implementing strategies and articulating the U.S. Soy Advantage effectively. Successful completion of the program will provide consistent and accurate data about the soybean sector since 2006 and will be an invaluable resource to establish a component value pricing system with the ability to increase the value of soy components by 20 to 80 cents/bushel back to the farmer.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Two emerging sources are threatening the competitiveness of U.S. soybeans: international competition, and competing sources of protein feed ingredients and edible oils (i.e. synthetic amino acids, DDGS, high protein canola and other vegetable oils). If these threats are not adequately addressed, the U.S. soybean industry is at risk of losing domestic and international market share. The Market View Database, containing domestic and international oilseed supply and disappearance data, is a reliable and timely resource to all U.S. soybean industry stakeholders. It is well aligned with the LRSP and will enable USB to take the lead in facilitating industry discussions about defining and enhancing the U.S. soy advantage. The data and information provided as part of this program will help to identify trends that may impact future strategic decisions.

2: Value Impact

Centrec analysis of protein and oil data from across an area in the U.S. shows that the range in estimated processed value (EPV) per bushel of soybeans coming from a single region in a single year can vary between $0.38 to $1.53. If the composition of all U.S. soybeans was improved so the average EPV in each region increases anywhere between 20 to 80 cents per bushel (a conservative portion of the existing variance), then the total value of the U.S. crop could potentially increase between $0.9 to $3.4 billion annually. Given the value potential of increasing protein and oil, there is an opportunity to understand the underlying causes of these differences and manage to produce higher value soybeans. A critical capability to enable such strategies is to be able to measure and report the compositional value of the soybeans back to farmers. The Market View Database provides USB with a reliable and traceable source of oilseed data and information pertaining to the U.S. Soy Advantage. Examples of information that could assist the discussions include the supply of value-enhanced products (such as high oleic soybean oil) and expanding the use of soybean meal by targeted end-use categories.

3: Execution Feasibility

Centrec has established an extensive network of contacts across the soybean industry and within various governmental agencies and USB and USSEC for data collection and validation. These contacts will be leveraged to identify and get feedback on possible enhancements. While there are always uncertainties involved with obtaining data from various entities, their extensive network provides USB with sufficient resources in the event that additional sources of information and data are needed. The updates to the internal operations of the MVD that were made under the FY17 project provides a solid foundation on which to add enhanced interface and functionality.

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This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
PROPOSAL ON A PAGE

POP Name: Advancing the U.S. Soy Advantage for U.S. Grown Soybean Oil to End Users

Short Name: CO-MO-D34

Proposal #: 1810-363-0634

Requested Budget: $1,003,566

Section A: PROPOSAL SUMMARY

In response to USB director requests to maintain U.S. soybean oil market share, this proposal focuses on international end-users and associated influencer groups (food companies, bottled oil manufacturers, and the HRI sector) to educate about the advantages of U.S. commodity soybean oil. The proposal seeks funding for marketing materials, trade teams, trade show participation, and technical support. Most of the work will be directed by USB’s world-wide support staff based in STL. However, regionally specific efforts are also included in this proposal in key markets where U.S. soybean oil is exported directly such as the Americas and MENA regions, and where U.S. soybeans are being crushed such as North Asia. End User Sustainability Partnerships — all of which will promote the U.S. Soy Advantage, but to a combined USB key domestic and international SBO End Users audience attending back-to-back industry events.

Section B. EVALUATION CRITERIA

1: Strategic Importance

U.S. soybean oil’s purity is better than oil derived from other nations’ soybeans making it generally more appealing to the global food industry, and less expensive to refine. Moreover, soybean oil’s neutral flavor makes it an attractive ingredient over oils such as palm, olive, and canola. Despite these advantages, conventional soybean oil could be impacted by restrictive food regulations, such as a country requiring food labels to state if the oil was derived from a genetically modified oilseed. Global palm oil production will increase 21 billion pounds by 2019 based on USDA 2015/16 estimates. This increase could spur lower oilseed pricings, making U.S. soybean oil less competitive in key markets. For example, Mexico’s imports of canola for 2017/18 are expected to increase to 1.6 million metric tons (97 percent of which is from Canada) (Source: USDA Gain Report). Over the last few years, competition from canola has slowed the annual growth rate of the US SBO market share in Mexico by three to four percentage points. Work to reverse this trend is critical to maintain this important market for USSBO.

2: Value Impact

While soybean value is driven largely by meal demand, a strong market is needed for the oil that comes from that crush to help maintain farmer profitability. Based on USB’s global customer survey conducted in spring 2017, only 52 percent of surveyed food manufacturers were aware of the specific advantages of USSBO and 56 percent felt USSBO had specific advantages compared to other edible oils. This proposal addresses this issue on two fronts: (1) differentiating U.S. soybean oil from other competing oils; and (2) differentiating U.S. SBO from other origin soybeans. The value of this proposal can be assessed by advancing audience awareness and opinion of USSBO advantages as evident by post activity survey results. This would show progress in reaching 2021 milestones.

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $360,000 from USDA/FAS. This proposal recommends a mix of conservative and innovative activities. The innovative approaches could present some risks as it will be the first time implementing them for oil. However, the type of work being proposed (trade show participation, material development and trade teams) certainly is well understood by our implementation staff. Therefore, we are not anticipating any issues with implementing this proposal.

USB will reach the top 25 percent of the food industry in target markets directly through this effort describe, but also through strategic partnerships formed with several trade associations both in-country as well as with key oilseed associations such as NIOP, AOCs and NOPA, among others. This proposal contains an interdependent activity with Smith Bucklin proposal (Driving Core Demand for HOSO) and Osborn Barr proposal Setting the Stage for National Relationship Building.

That said, the regulatory environment could certainly shift and make USB’s work more difficult. Changes in labeling requirements regarding trans-fats or GMOs would have the greatest impact and require midstream tactical adjustments. But USB does monitor the regulatory environment in these markets, helping us to stay well ahead of the issue and potentially mitigate risk. The actual work to address such issues is covered under the Market Access Program in the Sustainability Roadmap.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Name: Advancing the U.S. Soy Advantage for U.S. Soybean Oil to Buyers - Americas
Oil to Buyers - Americas
Short Name: CO-MO-E71
Proposal #: 1810-363-0635
Link to full proposal: 
Requested Budget: $350,000
Last Gate Score, if applicable: 

Section A: PROPOSAL SUMMARY

In response to USB director feedback to maintain U.S. soybean oil market share, this proposal focuses on maintaining U.S. soybean oil demand in the America’s region, which includes eight of the world’s top ten U.S. soybean oil importing countries. It would fund experienced, local contractors who would interact directly with key buyers who make the decision as to which oil to use, and will fund conferences and seminars to further differentiate U.S. soybean oil from other oils. This proposal does not depend on any other proposal, but the contractors funded by this proposal would help implement other SBO activities in the region targeting end-users (see proposal 1810-363-0634).

Section B: EVALUATION CRITERIA

1: Strategic Importance

The Americas is the largest region for exports of U.S. soybean oil accounting for 67.7 percent of total export volume in FY16 (Source: USDA). Eight of the world’s top ten importing countries are in this region including Mexico, Dominican Republic, Peru, Colombia, Venezuela, Guatemala, and Jamaica. Mexico accounts for nearly a quarter of U.S. exports making this a critical market. Although Colombia represented only 5 percent of U.S. SBO shipments in FY16, it was the fourth largest export market and could grow significantly (Source: USDA). After 2021, Colombia could be importing more soybean oil than Mexico when its quota on unrefined oil imports expires per the FTA.

This proposal focuses primarily on the Oil-Demand goal in the LRSP objective E (Buyers will seek out U.S. soybean oil based on the U.S. soy advantage and market the oil product to their customers) and secondarily on objective B (Buyers will be aware of the latest developments and technology releases of new and improved soy products and will make purchase decisions based on the U.S. soy advantage.) The work that the contractors conduct will also reach crushers and thus impact objective A (Crushers will seek U.S. soy because of its advantages over competing soy oils). The contractors that are part of this proposal have worked with U.S. SBO for many years and have thus forged important relationships with key customers in the region. Continuing to work with these customers will help contribute maintaining U.S. market share and therefore industry probability.

2: Value Impact

Keeping the target audience objective in mind, there is opportunity to educate buyers about U.S. SBO benefits so that they can highlight them to their customers. These customers have many choices for what food grade oil they use in their operations. Although soybean oil in general has many benefits over other oil options, negative consumer perceptions about trans fats have forced many food producers to formulate using these other options. For example, only 63 percent of food manufacturers in the Americas region responding to a global customer survey conducted spring 2017, said they prefer U.S soy oil because of its qualities compared to other edible oils. Clearly there is room to improve this preference which could help drive demand and improve grower profitability. This proposal does have potential to advance constituent/component pricing. Part of the overall messaging will focus on the refining advantages that U.S. soybean oil has compared to other origins. Although refinery are not a main focal point of this proposal, properly delivered messages should have some impact on value perceptions which could help maintain sales. The logistic and trade relationships between the United States and most of the countries of the Americas Region adds overall value to this proposal.

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $355,000 from USDA/FAS. The in-country contractors that would be funded by this proposal have many years of experience conducting technical support and trade servicing activities in the soybean oil sector. Therefore, USB does not anticipate and challenges or roadblocks in the execution of the work outlined in this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)
POPROAL ON A PAGE

POP Name: Advancing the U.S. Soy Advantage to Crushers - ASC
Short Name: CO-MO-A31
Proposal #: 1810-363-0636
Link to full proposal: 
Requested Budget: $52,000
Last Gate Score, if applicable: 

Section A: PROPOSAL SUMMARY

This proposal targets crushers in Pakistan and the associated oil value chain in India to build preference for U.S. soy. It would fund soy oil demonstration and branding promotion in India, sponsorship and participation in the Pakistan Edible Oils Conference (PEOC) in Pakistan, and contributes to the funding of an implementing contractor who will interface with key customers and execute activities. This proposal does not depend on any other proposal, but worldwide oil program support efforts funded under 1810-363-0634 would contribute to the execution of this proposal. In response to USB director feedback to maintain U.S. market share, this proposal focuses on crushers and the oil value chain to highlight the advantages of USSBO.

Section B: EVALUATION CRITERIA

1: Strategic Importance

India and Pakistan present interesting opportunities for U.S. soybean oil (USSBO). India is an oil deficit country yet one of the largest consumers, and relies on imports to fill demand. Indian edible oil imports are approaching 15 million metric tons (3,090,000,000 bu.) during the current oil year, up 29 percent from the previous year (source: USDA). Pakistan exports considerable oil volumes to India crushed locally. Although soy oil stood second in consumption after palm oil, it is still considered as commodity oil unless it is branded and packaged to attract consumer attention. Palm and canola currently dominate the oil market in Pakistan, although soybean imports for crush have increased dramatically. Most of soy oil comes from Argentina and some from Brazil with imports growing annually (9.8 percent in 2012/13, 16.8 percent in 2013/14, 20.7 percent in 2014/15, and 29 percent in 2015/16) (Source: USB field staff).

2: Value Impact

0636: Considering the rapid growth in demand for edible oil in India and the role its neighbors play in supplying that oil (most notably Pakistan), there is great opportunity for the U.S. soy industry to build demand here for US SBO. Currently, soybean oil is second to palm with Argentina holding the bulk of the market share. Educating key target audiences about U.S. soybean oil refining advantages and other intrinsic characteristics could help shift crusher preferences. The dual effort to affect the end of the value chain in India with promotions tied to USSBO demonstrations and branding could help pull demand from Pakistan which supplies a significant portion of India’s oil imports. Then direct work with Pakistani crushers on the oil supply side could further increase the likelihood of the success of this activity. The dollar request for this proposal is relatively low, but could affect real change in this important new market for the U.S. soybean industry. Five years ago, USDA reports that U.S. soybean product exports to the region was only around 32,000 metric tons. In 2015/16, that figure exceeded 1.4 million metric tons. This work could help boost exports even further. The industry generally recognizes that oil produced with U.S. soy is lighter in color and has a lower cost of processing than soy oil originating from South America. However, there continues to be a preference for canola and palm, because of higher oil contents and consumer preference. Educating crushers about US SBO advantages and the overall lower cost of production could help shift this balance and build demand for U.S. soybean oil. This proposal addresses USB’s LRSP Oil Demand goal Objective A ( Crushers will seek U.S. soy because of its advantages over competing soy oils.)

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $46,534 from USDA/FAS. The in-country contractors that would be retained as part of this proposal have many years of experience conducting technical support and trade servicing activities in the soybean oil sector. This experience should help mitigate potential challenges or roadblocks in the execution of this proposal. Concerns remain with regard to the acceptance of GMO in India. Efforts are ongoing to overcome this market access issue to insure it will not have a negative impact on the crush for Oil or the importation of Oil crushed from U.S. soy in neighboring countries.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Name: Promoting the Functionality of U.S. SBO Added Value Products - Americas
Products - Americas
Short Name: CO-NU-D34
Proposal #: 1810-363-0637
Link to full proposal: 
Requested Budget: $103,475
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY
This proposal seeks funding for a series of workshops to educate the food manufacturing sector in Mexico about the performance of U.S. interesterified soybean oil (USSSBO) in different manufactured food applications. Interestertified U.S. soybean oil is free of trans fats and can be a healthy replacement for fats and shortenings based on hydrogenated and tropical edible oils currently used by this industry. This approach aligns with USB Director requests for proposals that promote commodity oil role in EIE shortening and getting markets to adopted fully hydrogenated soybean oil as a bakery solution. We will explore working with Mexican manufacturers to develop these products. This proposal does not depend on any other proposal, but the contractors funded by this proposal would help implement other SBO activities in the region targeting end-users (see proposal 1810-363-0634).

Section B. EVALUATION CRITERIA

1: Strategic Importance
Currently, there is no trans-fat policy in Mexico. However, multinational food companies, driven by pressure from trans-fat bans in the U.S. and elsewhere, are moving towards formulating without trans fats, requiring alternatives to hydrogenated commodity U.S. soybean oil. Interestertified U.S. soybean oil provides an excellent choice, but education is needed about its availability and utility. This will help maintain U.S. market share against competing oils such as palm and canola. This proposal addresses USB’s LRSP Oil Demand goal Objective D (The food industry will seek U.S.-grown soybean oil.)

2: Value Impact
Mexico is the largest single export market for U.S. commodity soybean oil. In 2015/16, Mexico imported 235,554 metric tons of USSSBO ($18 million lbs. or 188,443 bu.), down 3.9 percent from the previous year (Source: USDA). At the same time, Mexico’s crush market is growing (lead by Ragasa), thus increasing demand for U.S. whole soybeans and counteracting some of this decline in direct USSSBO shipments. While USDA estimates USSSBO market share holding steady at around 61 percent for the last three years, competition has acted as a drag on the annual growth rate of USSSBO market share in Mexico (Source: USDA). Proactive work in the region will help ensure we maintain this share, particularly as the trans-fat dialogue intensifies. Working with food manufacturers now while they are reformulating to eliminate trans-fats will ensure that USSSBO remains the oil of choice in Mexico’s food manufacturing sector.

3: Execution Feasibility
USB does not expect this proposal to leverage additional third party funding. The contractor has not previously promoted interesterified oil in this market. While the subject matter is innovative, the type of work being proposed (workshops) is well understood by our implementation staff. Therefore, we do not anticipate any issues with implementing this proposal. That said, the regulatory environment could certainly shift and make our work more difficult. Changes in labeling requirements regarding trans-fats or GMOs would have the greatest impact and require midstream tactical adjustments. USB will monitor the regulatory environment in these markets, helping to stay well ahead of the issue and potentially mitigate risk. The actual work to address such issues is covered under the Market Access Program in the Sustainability Roadmap. The Canola Council of Canada has been working during the last couple of years to build demand in Mexico’s institutional sector (the armed forces, prisons, hospitals, etc.), constituting a significant threat.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE

POP Name: Partnering with End Users on New Utilization of HOSO
Short Name: NewUseHOSO
Proposal #: 1830-362-0601
Requested Budget: $840,121
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY

This program creates strong value for U.S. soy growers by driving adoption of High Oleic Soybean Oil (HOSO) by forming collaborative partnerships with End Users in the bakery industry, U.S. Military installations and food industry product developers. These efforts serve to reclaim market losses in recent years due to trans-fat regulations, which have resulted in a loss of 4 billion pounds of soy oil (363.6 million bushels) and put another 2 billion pounds (181.8 million bushels) at risk unless the food industry adopts HOSO and interesterified soybean oil. This POP is comprised of three activities that are grouped together because they support New Utilization of High Oleic Soybean oil by securing distinct partnerships with high profile End Users. “Innovative Shortening Market Development” (Activity A) proposes to secure partnership agreements with bakery distributors and heavy-duty frying companies to adopt interesterifered high oleic soybean oil and leveraging the QUALISOY brand to promote that adoption to a wider food industry audience, driving further demand. Combined, these markets are estimated to comprise 1.5 billion pounds (nearly 136.4 million bushels) of the overall North American demand for vegetable oils. “Feeding America’s Military” (Activity B) proposes to convince the U.S. Army’s Joint Culinary Center of Excellence to approve high oleic soybean oil and switch from using Canola at over 440 domestic military installations. “Driving New Utilization of HOSO” (Activity C) seeks to form partnerships between End User product developers and an oil refiner to facilitate their utilization of HOSO, helping to drive usage of 300 million pounds available in 2018 and work towards 3 billion pounds in 2022.

According to USB Director request, this program is highly innovative as it seeks new customers and forms valuable, unique partnerships in an effort to bring new high oleic products to the food industry. This proposal is not interdependent with any other proposals; however, high oleic products produced in these proposals will be communicated to the food industry through the Market Outreach proposals.

Section B. EVALUATION CRITERIA

1: Strategic Importance
- This program will strongly impact USB’s strategic goals and objectives by collaborating with the food industry to create high oleic soybean oil products for early adoption by End Users. It directly drives adoption of interesterified HOSO for two high profile end users (Bakery distributors and Heavy-duty fryers). And the market impact goes beyond these two end users. This proposal boosts the visibility of the food company partners’ adoption and usage of soy solutions, which increases the range and impact of this proposal, advances the U.S. soy advantage and works towards the FY18 Milestone to “secure food industry demand for the majority of the high oleic soybean oil produced.”
- This project is of strategic importance because, if successful, it will obtain the “seal of approval” for high oleic soybean oil from the largest branch of the military, the U.S. Army, opening the door for high oleic oil for all branches of the military. Right now, the U.S. Army primarily uses canola oil. This project seeks to dramatically change that scenario.
- Approval of high oleic oil will be obtained from the quality research division of the Army’s Joint Culinary Center of Excellence. This approval is required of any food service product, and once obtained, high oleic oil can be used within military food service establishments. The approval will lend credibility and marketability and will help create demand that corporate food service providers will run with.
- In order to drive new utilization of high oleic soybean oil, it is important to engage in facilitated discussions with Buyers and End Users to identify opportunities for increased education and opportunities to drive utilization.

2: Value Impact
- Early adopters are needed to utilize the 300 million pounds of high oleic in 2018 and set more groundwork towards the 3 billion pounds of oil available in 2022. Full utilization would result in $900 million benefit directly to US farmers in 2018 and grow to $900 million by 2022.
- As noted above, bakery distributors and heavy duty fryers represent a significant section of the overall North American demand for vegetable oils. More broadly, this proposal creates strong value for U.S. soy growers and leverages larger market opportunities: QUALISOY has estimated the value of High Oleic soybean oil and interesterified oil (EIE) to soybean producers alone to be $1.5 billion per year as of 2026, upon successful commercialization of HOSO and EIE (based on a complex economic analysis and with the involvement of a wide cross section of industry-interesterified --- HOSO offers excellent functionality—particularly for food companies looking to reformulate baked goods to remove partially hydrogenated oils (PHOs). Based on this functionality, interesterified HOSO can be drop-in solutions for the food industry.
- Getting the green light from Military brass will not only open the door for testing of high oleic oil on Army bases, but it will encourage military prime food vendors to carry the product and offer it not only to Army installations, but any and all military installations they might serve. Looking at quantitative data, government food contracts total more than $4 billion a year. U.S. Army domestic edible oil use is estimated at more than 10 million pounds per year.

3: Execution Feasibility
- Our team of professionals have successfully executed similar partnerships (driving adoption of US soy market offerings among foodservice distributors and food companies) with the help of processors. Incentives included in this proposal (e.g., access to the high functionality of U.S. soy solutions) will ensure that new partnerships with food company targets will be established and that relationships with processors will be maintained.
- The U.S. Army, when at all possible, is expected to adhere to the “Buy America Act” when it comes to the food purchases for its troops. Our edible oil experts have worked with military installations foodservice for years and a relationship has already been established with the chief of Quality Control of the U.S. Army’s Joint Culinary Center of Excellence; and there is a strong indication that with the presentation of credible data and reliable research that the military “seal of approval” for high oleic is well within reach.
- Our subcontractor currently works with Bunge’s food division to market their products and will leverage that relationship to facilitate End User collaborations on high oleic soybean oil solutions. No financial commitment by 3rd party partners is requested as part of this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)

Our contractors have forged unique, close relationships with key target audiences over many years that will help drive success of the programs.
This proposal helps sell more soybean oil to large End Users in the bakery market, giving them reasons to choose soy over palm and other oils as they race to remove remaining partially hydrogenated oils (PHOs) from products. The trans-fat issue has resulted in a loss of 4 billion pounds (363 million bushels) of soy oil and another 2 billion pounds (182 million bushels) are at risk unless the food industry adopts high oleic and alternative processing methods (USDA and QUALISOY). This POP is comprised of three complementary proposals that will validate high oleic soybean oils’ performance for the food industry. Activity A will show (1) IE HOSO shortening need a flavor profile that is optimized to be more similar to the flavor of PHOs. (2) IE HOSO has an opportunity to replace PHOs in laminated doughs and piercarts, but functionality data is needed to prove success in those applications. Activity B seeks to encourage refiners to validate performance that will support the production of IE HOSO products including an all-purpose shortening and a puff pastry shortening. Activity C will validate how high oleic soybean oil can be used to replace animal fat by the meat industry to create a sausage with a better nutritional profile, thus potentially boosting animal agriculture in the 6-billion-pound market that includes frankfurters, sausage and luncheon meat. The Directors are looking for Innovative proposals and address new areas where high oleic soybean oil can be utilized. The results of these performance validation testing will be communicated in Market Outreach proposals targeting audiences in Marketplace and Demand.

1: Strategic Importance

The four billion pounds of soybean oil market share that have been lost due to the trans-fat issue have largely been replaced by canola and palm oil, which increased by 2.9 and 1.1 billion pounds respectively from 2006 to 2015, based on Table 31 in the 2016 USDA Oil Seed Yearbook. The increased usage of canola (i.e. mid & high oleic canola) has been for frying applications and as a component for formulating shortening. The increased usage of palm has primarily been for bakery shortening. With the development of HOSO, soy now has advantages over BOTH canola and palm. This proposal will positively impact advancing the United Soybean Board’s (USB) strategic goals, multi-year roadmaps, and objectives by:

- Proving and quantifying the advantages of conventional and HOSO for the food industry. These proof points will contribute to soybean oil returning to a dominant position in the U.S. bakery market and beyond.
- Taking market share from palm and other high stability oils and returning it to soy. Without a successful IE HOSO solution (in bakery in particular), U.S. soybean farmers will continue to lose market share.
- Leveraging USB’s strategic partnership with Stratas Foods, Bunge and other processors selling IE HOSO provides USB with critical access to customer feedback and needs within the bakery industry.
- Creating an entirely new use for soybean oil in the processed meat market.

2: Value Impact

This proposal creates strong value for U.S. soy growers by validating performance of High Oleic Soybean Oil that will help reclaim lost market share. All purpose shortening, which is 100% addressable with these soybean oil shortening performance projects, has a volume potential of about 3 billion pounds (272 million bushels). The volume potential for laminated dough and pastries is approximately 5-8 billion pounds (455-727 thousand bushels; estimates provided by USB consultants). We will create a “best-in-class” product that is an all-soy solution. IE most effectively uses both conventional soybean oil and HOSO, so success of IE HOSO drives success in both markets.

Meanwhile, assuming meat processors replaced 5% of the animal fat they use with soybean oil, this would represent approximately 75 million pounds of new utilization of high oleic soybean oil with potential to grow considerably larger as more food companies seek better nutritional profiles for the meat they produce. QUALISOY estimates 300 million pounds of high oleic soybean oil will be available in 2018 and 3 billion pounds will be available in 2022. Full utilization would result in $90 million benefit directly to US farmers in 2018 and grow to $900 million by 2022. (Estimates provided by QUALISOY Value Chain Analysis)

3: Execution Feasibility

Our edible oil chemist consultants have worked for decades with numerous refiners and End Users validating edible oil performance. We have partnered with ADM’s food division, STRATAS Foods, on previous performance testing. They know the food industry’s market for a shortening solution is large and are highly motivated to create an all-soy solution. Iowa State universities meat science department is optimistic that high oleic soybean oil can be used in a process that will replace animal fat in sausage. The meat company, Hormel Foods, has included a letter with Iowa State’s proposal endorsing the use of HOSO as a way to process meat with a better nutritional profile which will “support the efforts of the food industry as a whole to increase value for crops while generating products for consumers throughout the world.”
## Section A: PROPOSAL SUMMARY

This program will create food industry demand for and full utilization of high oleic soybean oil, projected by QUALISOY to be 300 million pounds (27.3 million bushels) in 2018 and 3 billion pounds (270 million bushels) by 2022. This POP is comprised of two activities (Converting End Users & Buyers to HOSO, while overcoming barriers to its adoption by leveraging influential food industry nutrition professionals. These proposals will create demand from key target audiences, including End Users (such as food manufacturers, foodservice and university and grade school nutrition programs) and Buyers (food distributors), to ensure the majority of HOSO available for food use is sold and a pipeline of the target audiences are moving towards adoption. The Directors requested innovative (new, unfamiliar market or solution) proposals, this is innovative by providing new solutions for bakery’s shortening needs, providing new ways to directly reach target audiences and sourcing new audiences, like school nutrition programs. This POP is interdependent with a USSEC Oil proposal (Advancing the U.S. Soy Advantage for U.S. Grown Soybean Oil to End Users) and an Osborn Barr Sustainability proposal (Setting the Stage for End User Sustainability Partnerships – National Relationship Building) promoting the U.S. Soy Advantage with a Food Sustainability Tour. This collaborative effort seeks to strengthen relationships with key USB domestic and international food industry End Users by directly engaging them with a U.S. soybean farmer whom they trust and respect. This proposal is complementary with other proposals that target audiences in Supply (Farmers and Seed Companies) and Marketplace (Oil Refiners), while executing strategies advanced by the QUALISOY board and USB.

### 1: Strategic Importance

The successful completion of this proposal will positively impact advancing the United Soybean Board’s (USB) strategic goals, multi-year roadmaps, and objectives by:

- Outreach to the food industry to seek high oleic soybean oil because of its functionality, high stability and nutrient profile showcasing all the benefits through strategic marketing communications, including web, newsletter, conferences, meetings and targeted media opportunities.
- Moving the food industry End Users from high oleic soybean oil consideration to trial to adoption through strategic meetings with food companies, impactful outreach at targeted events, and leveraging memberships in key organizations.
- Differentiating U.S. soy and demonstrating and communicating the advantage of U.S. market soy offerings, including building awareness, generating trial and increasing adoption of U.S.-grown enzymatically interesterified (EIE) high oleic shortening.
- Targeting an attractive market of End Users through the new partnership program (bakery/food company/foodservice), which creates a new window of opportunity to recognize the Long Range Strategic Plan goal of helping more end users recognize, use and communicate the advantage of U.S.-grown HOSO.
- Continue to build awareness and trial of high oleic oil to school nutritionists at university and grade school foodservice organizations.
- This program will create food industry demand for and full utilization of high oleic soybean oil, projected by QUALISOY to be 300 million pounds (27.3 million bushels) in 2018 and 3 billion pounds (270 million bushels) by 2022.

### 2: Value Impact

This proposal creates strong value for U.S. soy growers by:

- Driving large numbers of End Users to learn about, accept and adopt high oleic soybean oil, resulting in using 300 million pounds available in 2018 and reformulating their processes to using 3 billion pounds by 2022. Full utilization would result in $90 million benefit directly to US farmers in 2018 and grow to $900 million annually by 2022, according the QUALISOY’s Value Chain Analysis.
- Recapturing additional markets for farmers through the communication of new functionality testing results. Showing food companies that HOSO is a drop-in replacement for PHOs in 3-billion-pound bakery market, taking market share away from palm, returning it to soy.
- Differentiating U.S.-grown soy from competitive oils and driving interest and trial of U.S. soy market offerings by enhancing the visibility of the new bakery/food company/foodservice partnership case study and through compelling advertisements delivered to key audiences.
- Leveraging hundreds of thousands of nutrition professionals who make decisions about edible oil usage or influence edible oil consumption.
- Creating valuable partnerships at impactful industry events through exhibiting, sponsorships and networking with target audiences and key decision makers.

### 3: Execution Feasibility

No technical or market challenges are identified for this proposal. These contractors have more than 20 years of experience promoting soybean oil with food industry and have been involved with high oleic soybean oil since its inception. As a direct result of USB/QUALISOY efforts, numerous End Use customers are evaluating conversion to HOSO, including Dawn Foods, Kellogg’s, Cracker Barrel, Culver’s Restaurant, Pinnacle Foods, Campbell Soup Company, Tyson Foods, T.Marzetti foods, J.R. Simplot foods and more.

Our team follows the strategic direction set by QUALISOY and the USB Demand Action Team and will leverage existing relationships and networking opportunities provided by tradeshows to ensure events are executed for maximum impact and ensuring valuable insights are captured from quality industry contacts. Our strong relationships with tradeshows and other events and years of experience managing events provide unique added-value opportunities making these events more cost-effective and efficient. No financial commitment by 3rd party partners is requested.

## Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP builds preference for the U.S. Soy Advantage among end users and will increase demand of commodity soybean oil, thereby increasing profits for U.S. soybean farmers. It will help protect and expand U.S. soy’s current largest market share of 12.5 billion pounds of commodity soybean oil, which has decreased by 27 percent due to the trans-fat issue, with a competitive differentiator that hits home - “Grown in the USA.” It will leverage successes from the United Soybean Board’s (USB) “U.S.-Grown 100 Percent Soybean Oil” retail partnerships and compelling consumer perception data to motivate food manufacturers, distributors, edible oil bottlers and food retailers to promote or adopt “soybean oil” and/or “U.S. grown” as a product name/attribute to drive sales and to source U.S. grown soy solutions for their products to increase sales. Additionally, it will address factors that might discourage commodity soybean oil sourcing and labeling, such as health concerns and misinformation, via end user influencers (health professional, industry media). The second part of this POP executes a directed advertising campaign built on established relationships within food industry media outlets to further drive awareness of the soy advantage by putting USB messaging directly in front of critical end users via strategic ad placement, white papers and videos. Directors requested a conservative degree of innovativeness for this area.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The successful completion of this proposal will positively impact advancing USB’s strategic goals, multi-year roadmaps, and objectives by:

- Building preference for U.S.-grown, a point of differentiation demanded by end users, such as Walmart, and increasing use of commodity soybean oil while helping to regain lost market share. The program will leverage USB partnerships that demonstrated product sales increases of up to 27 percent when vegetable oil/manufactured foods containing vegetable oil were promoted as “U.S.-grown 100 percent soybean oil” to motivate end users to promote or adopt “U.S. grown” and/or “soybean oil” as a product name/attribute.
- Leveraging current market conditions to promote/source U.S.-grown soy solutions (commodity and high oleic soybean oils, and soy-based partially hydrogenated replacements). End users are demanding local and sustainable products because their consumers are asking for products that are local, safe, and sustainable. According to USB’s 2017 Food Industry Insights survey, 63 percent of consumers are more likely to purchase a product if it displays a label stating it was made with 100 percent U.S. grown ingredients.
- Creating a new opportunity for USB to lead the clean label conversation with end users and increase adoption of U.S.-grown soy solutions. There is a consumer push for “clean labeling,” which is defined differently by end users, as there is no industry standard. To most, clean label means products containing safe, simple/natural, sustainable and local ingredients. USB can promote U.S.-grown soy’s clean label attributes, including locally grown and sustainable practices, to help end users define clean label for their brand. Including U.S.-grown soy solutions in products allows end users to label their product as “Made with U.S.-grown ingredients,” making their products more attractive to their consumers and to buyers.

2: Value Impact

This proposal creates strong value for U.S. soy growers by executing campaigns that will increase the use of commodity soybean oil. USDA data shows annual domestic soybean oil consumption at 12.5 billion pounds. The total market for edible oil is 25 billion pounds. (USDA)

- Increasing use of commodity soybean oil by differentiating U.S.-grown soy from competitive oils and leveraging end user demand for local and sustainable ingredients to protect and grow the core $12.5-billion-pound market for commodity soybean oil.
- Driving interest and adoption of “U.S. grown” and/or “soybean oil” as a product name/attribute by promoting compelling sales and positive shopper perception results from past USB partnerships with credible end users, such as Hy-Vee, Hellmann’s (mayonnaise) and Hispanic retailer Goya Foods.
- Capitalizing on new interest from end users in promoting or relabeling products as “U.S. grown” and/or “soybean oil,” and driving them towards adoption (targets include: Bozutto’s Inc., Cardenas, Kroger, CVS, SUPERVALU, Jet.com and Delhaize).
- Leveraging USB’s partnership with Hispanic retailer Goya Foods to increase awareness of the soy advantage to this growing population and its increasing buying power. Hispanics represent nearly 18 percent of the U.S. population and are expected to grow to 24% by 2040. (Source = http://www.nielsen.com/us/en/insights/news/2016/hispanic-influence-reaches-new-heights-in-the-us.html)

3: Execution Feasibility

No technical, market or implementation/adoption challenges are identified for this proposal. Our professional team and USB will take advantage of the timing of the new federal nutritional guidelines, which are forcing many food retailers to re-brand their private brands, to overcome potential cost barriers to retailers adding “U.S. grown” and/or “soybean oil to their label. (Source = New FDA nutrition facts labels guidelines: https://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm502182.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery)

Past USB success efforts partnering with high-volume vegetable oil bottlers include: Hy-Vee Hellman’s resulting in a 27 percent unit sales increase during a USB promotion that advertised its store-brand vegetable oil as U.S. grown 100 percent soybean oil. Goya Foods resulting in a 25 percent unit sales increase during a promotion with USB that added “100 percent soybean oil” to their vegetable oil labels.
Section A: PROPOSAL SUMMARY

This proposal will address the Biodiesel/Bioheat Roadmap, stages 2, 3, and 4 while helping to meet the FY18 milestone to increase the utilization of soybean oil for Biodiesel (not including Bioheat) by 135 million pounds. Vehicles represent one of the largest capital outlays for many diesel users whether that be a farmer running a truck or a combine, or a large trucking company transporting goods. Consequently, customers are much more likely to use B20 if their engine/vehicle company has gone on public record supporting B20 than if that company only supports B5. OEM support for B20 is taking on even more importance as EPA looks at OEM support levels when considering increasing volume levels under RFS2, and as new foreign companies who have not been players in the US diesel market begin to introduce new diesel models. Maintaining or increasing OEM support for biodiesel will help increase the utilization of biodiesel and soybean oil usage, and this proposal serves to strengthen the relationship between the NBB/USB and this key end user audience. In 2016 biodiesel used approx. 5.6 billion pounds of soy oil. NBB will propose $100,000 to Illinois Soybean Association for additional funding.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The biodiesel industry has grown from 1.5-billion-gallons of demand in 2011 to 3 billion gallons of demand in 2016 utilizing approx. 5.6 billion pounds of soybean oil and per USDA that number is expected to grow to 6.2 billion pounds in 2017. Biodiesel producers and National Biodiesel Board (NBB) members believe securing and maintaining B20 support from diesel engine and vehicle companies (OEMs) is the single highest technical priority for the industry. Engine manufacturers are not aware of the low carbon footprint of biodiesel made with U.S. soybeans. This proposal will help build awareness through continued targeted training programs and relationship building, strategic planning and feedback sessions, and provide on-going technical briefings and updates to targeted OEMs. This will include continued networking with other groups such as the Clean Cities organizations, the Diesel Technology Forum, auto industry trade associations and other stakeholder groups to enhance the efforts.

2: Value Impact

Maintaining or increasing OEM support for biodiesel will help increase the utilization of biodiesel and soybean oil usage, and this proposal serves to strengthen the relationship between the NBB/USB and this key end user audience. This proposal will work cooperatively with the OEM technical, engineering, and regulatory departments to execute technical work that addresses issues or questions they have raised about biodiesel such as low carbon footprint of biodiesel, impacts of biodiesel metals on new and future after-treatment systems, negative impacts of biodiesel degradation products, and initial testing on blends over B20 among others. The biodiesel industry has grown from 1.5-billion-gallons of demand in 2011 to 3 billion gallons of demand in 2016 utilizing approx. 5.6 billion pounds of soybean oil and per USDA that number is expected to grow to 6.2 billion pounds in 2017.

3: Execution Feasibility

NBB will have a presence at targeted OEM trade shows to maintain biodiesel’s presence as a major factor within the minds of the OEMs and will update the OEM business case for B20 by encouraging all OEMs (existing and new) to put B20 in their design plans for all current and future models, with a focus on educating and informing new US diesel entrants on the importance of supporting biodiesel. As part of this updated business case, NBB will work with OEM customers to encourage them to put B20 in their vehicle purchase bid specs and to work with high profile fleets or end users to document positive biodiesel use and quantify the business reasons they are using B20 or higher biodiesel blends which is powerful information that can be delivered to the OEMs. NBB will propose $100,000 to Illinois Soybean Association for additional funding.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This proposal will address the Biodiesel/Bioheat Roadmap, stages 2, 3, and 4 while helping to meet the FY18 milestone to increase the utilization of soybean oil for Bioheat by 210 million pounds. Industrial users lack information about the benefits of U.S. soy-based Bioheat® that limit adoption. With recent approval of the B6-B20 ASTM grade in D396, NBB will execute key technical proposals to build overall market confidence and address concerns of end users and dealers regarding use of B20 in existing equipment such as fuel quality monitoring, work with third party certifiers, efforts with long term durability of fuel pumps, and adoption of the new B6-B20 grade with various regulatory authorities having jurisdiction such as NFPA. NBB will also execute key technical proposals to address questions and concerns with use of B21-B100 blends identified by the Bioheat Technical Steering Committee (BTSC) that will build confidence with high blend early adopters, and that are needed to secure ASTM standards for blends over B20. NBB will seek additional funding of $50,000 from Illinois Soybean Association and South Dakota Research and Promotion Council.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Biodiesel use in home heating oil as Bioheat® represents an important and promising market to meet USB’s objective of making soybean oil the top choice for heating oil production and to increased RFS2 volumes. The oil heat industry estimates that the market size of their industry is 7-9 billion gallons per year depending on how cold the winter season is each year. In 2014, the National Oilheat Research Alliance (NORA) confirmed their plans for increasing the biodiesel concentration in heating oil and NORA members voted biodiesel research a top priority with plans to achieve B50 by the year 2030 and B100 for all heating oil by the year 2050. Low carbon biodiesel represents a heating oil dealer’s best defense against market share erosion from natural gas. The low carbon benefits of soybean oil based biodiesel are the most well documented in the world.

2: Value Impact

Protecting and growing the Biodiesel/Bioheat market is necessary in order to realize the 2021 goal of utilizing 2.04 billion lbs. of soybean oil in Bioheat. In support of USB’s milestones to increase Bioheat® fuel utilization, this project provides a foundation of information, education, coordination and outreach which will be designed to ensure soybean oil will be the top choice for heating oil. According to industry sources 700 million pounds of soybean oil was used in producing bioheat in MY2013/14. A 2012 economic study by Informa Economics showed that due to the growing biodiesel market soybeans increased on average by $0.73 per bushel and the price of soybean meal declined by $25 per ton.

3: Execution Feasibility

The heating oil industry is largely comprised of relatively small, family owned petroleum delivery businesses that deliver fuel in 250 gallon quantities several times a year to family residences that burn fuel oil to heat a family home. These same companies also provide fuel oil used to apartment buildings and large commercial buildings (i.e. downtown New York City) to provide hot water and steam from larger boiler systems. Not dissimilar to farming operations, there are some heating oil dealers that are early adopters and risk takers that have embraced change with vigor, while most are more conservative and slower to adopt new technology and ideas. NBB is partnering with NORA on bioheat technical efforts and expects a minimum of one for one match for bioheat technical proposals. NBB’s success is well-documented and includes progress in expanding fuel quality, biodiesel awareness, positive perception and market growth. NBBs work has proven to be a collaborative effort between NBB, USB, QSSBs and Industry in order to maximize efforts and leverage dollars. NBB will seek additional funding of $50,000 from Illinois Soybean Association and South Dakota Research and Promotion Council.

Section C: SPECIAL CONSIDERATIONS (optional)
The University of Minnesota is working with BASF and Evonik who have evaluated both commodity and high oleic soybean oil plasticizers. In the U.S. Asphalt Market, the HOSO-based elastomer would require 3,780 tons HOSO from 670,000 bushels of soybeans. The cost to use the HOSO-based elastomer will be $45 per ton of asphalt vs. $80 per ton using SBS. At 10% market share of the asphalt polymer market, legislative bodies are expected to allocate more funds for repair and rehabilitation work. Seneca Petroleum is one of the largest suppliers of asphalt in the Midwest and one of the first to introduce the use of polymer additives. They are 3 million bushels.

Kansas Polymer Research Center and their future commercial partner - Based on the consumption of polyurethanes in North America, polyols are obtained (industry sources). In the last 10 years of commercialization, the potential soybean consumption of those 500 MM lbs. would be 4.5 MM bushels if a 10% penetration rate is achieved. Argo Genesis and Senaca Petroleum are moving forward USB supported technology development by Iowa State University for thermoplastic elastomers based on HOSO. The target application is asphalt modification. There are 2.4 million miles of asphalt-surfaced pavements in the U.S. (National Asphalt Paving Association) and legislative bodies are expected to allocate more funds for repair and rehabilitation work. University of Minnesota, with USB support, has developed soy oil based plasticizers that are effective in softening and improving the processing of PVC plastic. Traditional petroleum-based phthalate plasticizers are being replaced due to health and environmental concerns. Two leading plasticizer suppliers, BASF and Evonik, are working with University of Minnesota on commercialization. Size of market: 4.5MM bushels.

North Dakota State University (NDSU) is developing a new HOSO-based plasticizer / process aid that will enable an increased use of crumb rubber content in the new rubber compounds. Crumb rubber is used in athletic and playground surfaces, trails and walkways, automotive parts, molded and extruded products, and rubber and plastic blends. Size of market: 1.5 MM bushels.

Kansas Polymer Research Center is developing polyols made from soybean oil (a renewable resource), glycerol (an under-utilized biobased byproduct), and recycled polymers that can be used to make polyurethane foams, cast resins, and sealants. Increasing regulatory and environmental actions have spurred the development of biobased polyurethanes. Size of market: 9 MM bushels.

### Section B: EVALUATION CRITERIA

#### 1: Strategic Importance

Argo Genesis and Senaca Petroleum are moving forward USB supported technology development by Iowa State University for thermoplastic elastomers based on HOSO. The target application is asphalt modification. There are 2.4 million miles of asphalt-surfaced pavements in the U.S. (National Asphalt Paving Association) and legislative bodies are expected to allocate more funds for repair and rehabilitation work.

University of Minnesota, with USB support, has developed soy oil based plasticizers that are effective in softening and improving the processing of PVC plastic. Traditional petroleum-based phthalate plasticizers are being replaced due to health and environmental concerns. Two leading plasticizer suppliers, BASF and Evonik, are working with University of Minnesota on commercialization. Size of market: 4.5MM bushels.

North Dakota State University (NDSU) is developing a new HOSO-based plasticizer / process aid that will enable an increased use of crumb rubber content in the new rubber compounds. Crumb rubber is used in athletic and playground surfaces, trails and walkways, automotive parts, molded and extruded products, and rubber and plastic blends. Size of market: 1.5 MM bushels.

Kansas Polymer Research Center is developing polyols made from soybean oil (a renewable resource), glycerol (an under-utilized biobased byproduct), and recycled polymers that can be used to make polyurethane foams, cast resins, and sealants. Increasing regulatory and environmental actions have spurred the development of biobased polyurethanes. Size of market: 9 MM bushels.

#### 2: Value Impact

Argo Genesis and Senaca Petroleum - Asphalt modifiers are used in high-performing pavements to resist cracking at low temperatures and rutting caused by sustained loads at high temperatures. Compared to established competition (styrene butadiene styrene copolymer – SBS), the expected cost to use the HOSO-based elastomer will be $45 per ton of asphalt vs. $80 per ton using SBS. At 10% market share of the asphalt polymer market (U.S. Asphalt Market, July 2015 – Freedomia), the HOSO-based elastomer would require 3,780 tons HOSO from 670,000 bushels of soybeans. University of Minnesota along with BASF and Evonik - The U.S. market is estimated at over four billion lbs. (ICIS, BASF, Exxon/Mobil). The PI and BASF have estimated that there is a potential of 500 MM lbs. in the U.S. market that could be displaced by these soy-based plasticizers. After five years of commercialization, the potential soybean consumption of those 500 MM lbs. would be 4.5 MM bushels if a 10% penetration rate is obtained (industry sources).

North Dakota State University in collaboration with Ford and rubber goods manufacturers - The PI estimates that HOSO use as a plasticizer / process aid in crumb rubber for original equipment tire compounds has the potential for 7,000 tons oil per year (~ 1.5 MM bushels of soybeans), growing to 35,000 tons (7.5 MM bushels) in five years. With this proof of concept, other rubber goods applications would be additional use.

Kansas Polymer Research Center and their future commercial partner - Based on the consumption of polyurethanes in North America, polyols are about a 4-billion-pound market. The PI estimates that replacing 10% of the current polyols with soy-based polyols will utilize 400 MM pounds (9 million bu.)

#### 3: Execution Feasibility

Seneca Petroleum is one of the largest suppliers of asphalt in the Midwest and one of the first to introduce the use of polymer additives. They are collaborating with Kraton Polymers, the leading supplier of SBC polymer for asphalt modification.

University of Minnesota Is working with BASF and Evonik who have evaluated both commodity and high oleic soybean oil plasticizers.

North Dakota State University proposal is based on previous favorable results using SBO in a project supported directly by USB initially and then in collaboration with the Ford Motor Company.

Kansas Polymer Research Center has extensive experience in polyurethane polyols and conducting USB supported research.
**Section A: PROPOSAL SUMMARY**

This POP is designed to support activities covering various technical support programs under the Industrial Uses – Oil Roadmap in stages 1, 2, 3, 4. These activities are independent and part of the critical path to address the LRSP objectives A & B end user’s audience, and critical to achieving the milestone of increasing the demand for conventional soy oil (SBO) by 100 million lbs. in FY18 and achieving one billion lbs. of U.S. high oleic soybean oil (HOSO) utilization by 2021. These activities will support continuing the growth in industrial demand for conventional soy oil, while identifying new applications for both conventional oil and HOSO oil.

**Section B. EVALUATION CRITERIA**

1: Strategic Importance

Comparative Property Testing of HOSO to Other Oils will test HOSO oil in critical application specifications versus petroleum oils and other bio-oils to determine where HOSO’s unique, functional properties can be substituted in industrial applications.

Based on the identified functional properties, a HOSO Market Opportunity Study will investigate and identify new industrial market opportunities for high oleic soybean oil that will accelerate the development new uses and the substitution opportunities for HOSO.

Global Opportunities – Soy Polyols/polyester resins will support the continued developmental growth and awareness of soybean oil as a key renewable industrial chemical. This allows for technical outreach, support, and communication of the advantages of U.S. soybean oil, in soy polyols, alkyl resins, and unsaturated polyester resins, to global and major regional manufacturers in China and Europe. In 2016 the polyurethane industry in China and Europe consumed, 7.9 and 6.6 billion lbs. of petroleum based polyols that at 10% substitution would require oil from 17.5 and 14.6 million bu., respectively (PU Magazine, Vol. 14, no. 1).

Technical and Commercial Support for New Industrial Oil Uses – The objective of this activity is to support and enhance the continued volume growth of conventional soybean oil by 100 MM lbs. (9 million bu.), and to accelerate the development of industrial uses for HOSO and its derivatives by identifying and initiating technical feasibility studies with high value or volume industrial product developers regarding advantages of HOSO’s functional properties vs petroleum oils.

2: Value Impact

Comparative Property Testing of HOSO to Other Oils: Domestic competing biobased oils, e.g., canola, sunflower seed oil, realize 6-8 cents/pound and 10-20 cents/pound premium over soybean oil respectively, while refined mineral oil is currently at the low end of its historical price range. This activity will identify functional values of HOSO that will support higher pricing in selected applications.

HOSO Market Opportunity Study: The scope of this activity will find applications that will use HOSO, estimate potential consumption volumes in industrial applications and determine price sensitivity versus competitive oils. It will attempt to screen companies or universities during the investigation phase to aid USB in selecting organizations to be considered for future funding.

Global Opportunities – Soy Polyols/polyester resins will work with Cargill Industrial Services to build demand for soy polyols, epoxidized soybean oil and polyester resins, made from U.S. soybean oil for use in polyurethane foams, paints and coating, and unsaturated polyester resins. Any additional volume generated by global and regional manufacturers of soy based products in China and Europe benefits the growers directly by increasing demand and preference for U.S. produced soybeans and derivatives.

Technical and Commercial Support for New Industrial Oil Uses is targeted to maintain industrial demand growth from new and existing industrial applications at 7% for the FY17-18 marketing year (oil from 9 million bu.).

3: Execution Feasibility

SmithBucklin and Omni Tech International (OTI) are qualified to support the achievement of USB’s Strategic Goals, due to staff with in depth knowledge of industrial product development processes, industrial experience in bringing new products to commercialization, and multiple industrial contact networks that are continuing growing. Both SmithBucklin and Omni Tech staff are capable of executing their roles as outlined above in support of the USB long range strategic plan and achieving the 2021 milestones.

**Section C: SPECIAL CONSIDERATIONS (optional)**
# PROPOSAL ON A PAGE

**POP Name:** Trade Shows & TAP Meetings  
**Short Name:** TradShwTaps  
**Proposal #:** 1840-362-0723  
**Requested Budget:** $106,250  
**Last Gate Score, if applicable:**  

<table>
<thead>
<tr>
<th>Section</th>
<th>Evaluation Criteria</th>
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<tbody>
<tr>
<td><strong>A: PROPOSAL SUMMARY</strong></td>
<td>This POP is designed to support roadmap Industrial Uses – oil and work in stages 1 and 4. Manufacturers of high value or high volume industrial products lack information on the availability, proper use, and benefits of products derived from soybean oil and meal. This proposal provides opportunities to facilitate the exchange of information, building awareness, and preference for soy through participation in relevant industry trade shows and hosting of Technical Advisory Panel (TAP) meetings to review funded proposal progress toward KPIs. These activities serve as a vehicle to transfer technology and offer excellent networking opportunities with industry and academia. This proposal will promote the use of soybean oil and meal to multiple industrial end users and in numerous products. The raw materials consumed by the polyols in polyurethane foam, rubber and coatings industries alone consume 7.7 billion pounds of petroleum derived oil. This proposal is interdependent with OsbornBarr Proposal #1850-361-0767.</td>
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<td><strong>B: EVALUATION CRITERIA</strong></td>
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1: **Strategic Importance**  
This proposal fits into the Long Range Strategic Plan to increase meal and oil usage in large industries with major commercial partners. The activities planned for this proposal allows for the continued strengthening of ongoing relationships with strategic commercial and academic partners who attend conferences and trade shows or the TAP meetings in order to stay abreast of new technology that will affect the manufacturers in and suppliers to the various industries. It allows for the development of potential new partnerships and to promote the use of soy derivatives as biochemical building blocks, and also makes the specific industry attendees aware of the successful commercialization of products that contain soy, often sparking a new use or new direction for product development. The raw materials consumed by the polyols in polyurethane foam, rubber and coatings industries alone consume 7.7 billion pounds of petroleum derived oil. In addition, this proposal will enable USB to find meaningful participation opportunities in new markets such as soy oil-based thermoplastics and markets with new growth potential, such as lubricants and specialty chemicals.  

2: **Value Impact**  
Participation in industry trade shows in addition to strengthening existing strategic partnerships, allows for the creation of new partnerships with commercial and academic researchers. Making potential partners aware of new or existing technology increases demand for soy derivatives, which drives better pricing for soy oil, derivatives, or meal. The cost to participate in industry trade shows is relatively small in comparison to the potential return due to increased demand for soy derivatives consumed by a given industry, e.g. The raw materials consumed by the industries targeted is multiple billions of lbs. per industry, e.g. consumption of polyols in polyurethane foam in N. America in 2016 was over 3.7 billion lbs., N. American tire and rubber market which consumed over 1 billion lbs. of petroleum derived oil = soy oil from 93 million bu. (Freedonia Group, 2015), coating industry which consume over 3 billion lbs. of resins annually, or the wood adhesive industry which could consume ~380,000 tonnes of soy flour (21 million bu. of soy beans) to meet all the needs of the North American oriented strand board (OSB) market (per Norbord ltd).  

3: **Execution Feasibility**  
USB Staff and Omni Tech Commercial Managers have a large network of researchers and product developers within target industries which is continually growing and changing. This proposal allows the maintenance of those networks while adding new researchers and organizations to the network for future new product developments, increasing demand for soy oil and meal.  

**Section C: SPECIAL CONSIDERATIONS (optional)**
SECTION A: PROPOSAL SUMMARY

This POP is designed to support five individual activities under the roadmap Industrial Uses – Oil in stage 2, 3, 4: Activity 1 - Rust Oleum, Activity 2 - Battelle, Activity 3 - NDSU, Activity 4 - SUSMER LLC and Activity 5 - Iowa State University. The activities are independent and range from two multi-million dollar companies, Rust Oleum and Battelle; two universities, NDSU and ISU; and a startup company, SUSMER LLC. Several different coating segments are covered and represent diverse entry points for the chemistry into the coating industry. Soybean consumption ranges between 2.7 to 14 M bushels split 50% between high oleic and commodity soybean oil. ISU and SUSMER’s activities are ready for commercialization. Rust-Oleum, NDSU and Battelle (currently funded) are early stage opportunities focused on developing the technology. Leveraged funding: Activity A - $100,000, Activity D - $81,000 and Activity E - $100,000.

SECTION B: EVALUATION CRITERIA

1: Strategic Importance

These activities represent a diverse opportunity for the USB to support both HOSO and commodity soybean oil potential consumptions in the coatings market. Rust-Oleum, NDSU and SUSMER - Emulsion polymers are one of the fastest growing segments in the specialty chemical market according to Markets and Markets and are expected to grow globally at 7.7%. U.S. emulsion polymer consumption was at 5.7 billion lbs. in 2014 according to Grand View Research. All three activities focus on different technologies and applications and are independent from each other. Rust-Oleum is one of the largest coating companies in the US, NDSU has a long history of using soy oils in coatings and SUMSER PI has a history at South Carolina with soy-based development including HOSO. Battelle - To address the regulatory concerns on solvent usage in coatings, the use of powder coatings has increased. Per Grand View Research, the furniture segment (one of the target markets using Medium-density fiberboard MDF) will witness a substantial growth of more than 7.6% in the coming years and IKEA, a major producer of MDF furniture, has stated that they would like to switch to using at least 80% powder coatings by 2018 according to Ecodesign. Iowa State Univ. - Leverages three years of previous USB funding (PI is world renowned in lipid chemistry) to create two new soy-based paraffin wax substitute coatings from both commodity soybean oil and HOSO. Bunge is one of the world’s largest oil processors and is partnering to commercialize two soy-based paraffin wax substitute coatings.

2: Value Impact

Rust-Oleum - Rust-Oleum will leverage the technologies with Tremco (world leader in supplying sealant, weatherproofing, and residential waterproofing products) and DAP (large supplier of premium caulks, sealants and adhesives). Rust-Oleum’s consumption of soybean bushels (100% HOSO), is estimated at one million bushels two years and could grow to as much as five million bushels with Tremco and DAP consumptions to be determined.

Battelle is the world’s largest independent R&D organization and has partnered with The Powder Coating Research Group (PCRG), a world leader in powder coating materials technology development. Battelle has estimated at a 1% global market share and 25% soy content; over 1.2 million bushels of soybeans could be consumed, HOSO or commodity.

Iowa State Univ. - The Freedonia Group predicts U.S. demand for all waxes will grow 1.8% annually through 2019 to nearly three billion pounds ($3.2 billion value). For paper and paperboard & coatings and inks applications, consumption is estimated at 1.3 million bushels of soybeans (uses 10% HOSO and 90% commodity soybean oil).

NDSU - Soy-based acrylic monomers enable the production of low volatile organic compounds (VOC) resins and waterborne paints and are coating building blocks. Consumption equates to 420,000 bushels of soybeans with a potential split of 80% HOSO and 20% commodity soybeans at 30% substitution rate of petroleum-based materials, at five years after commercialization.

SUSMERS - A new start-up company is leveraging soy-based technology developed at South Carolina University by the founder. Consumption is estimated at 1.2 M bushels of HOSO soybeans after five years of commercialization.

3: Execution Feasibility

Rust-Oleum - The key technical challenges include finding a low cost synthetic approach to produce soy based high oleic hydrophobic acrylic monomers, key reaction parameters and to create a stable acrylic emulsion that Rust-Oleum can handle. Battelle and (PCRG) - There are technical uncertainties that are being addressed by both partners and are manageable. Market uncertainties have not yet been addressed due to the early stage of this proposal. ISU and Bunge – Scale up uncertainties including optimizing the manufacturing process and economics are outstanding and will be address by Bunge and ISU. NDSU – The technology has significant roadblocks that need to be overcome including if substituting HOSO for commodity soybean oil can make up the differences seen in previous funding. SUSMERS –There are scale up as well as market development challenges in this proposal and not clear that SUSMERS has the skill sets to resolve.
PROPOSAL ON A PAGE

POP Name: Industrial Coating Additives
Short Name: CoatingAdd
Proposal #: 1840-362-0737
Requested Budget: $484,490
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY

This POP is designed to support 3 individual activities under the roadmap Industrial Uses – Oil in stage 2, 3, 4: Activity A - GA Southern Univ., Activity B - Rust Oleum and Activity C - 1st Source. The activities are all independent with two companies, Rust Oleum and 1st Source Research and one university, Georgia Southern. These activities support new entry points for soybean consumption as additives into coatings where the additive provides a specific property improvement creating additional consumption in both petroleum and soy coating systems. Soybean consumption ranges between 2.6 M bushels to 7 M bushels comprised of 90% commodity soybean oil (all three) and 10% high oleic soybean oil (1st Source). All three activities have been previously funded by the USB and are on sound commercialization paths with 1st Source beginning in 2017 and the other two targeting 2019. Leverage Funding: Activity A - $30,000, Activity B - $200,000, Activity C - $60,000.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Coating additives represent a unique opportunity for the USB where reduction of harmful volatile organic compounds (VOC) are driving the need to meet increasingly stringent regulations and customer needs for Rust-Oleum and 1st Source activities.
Rust-Oleum – Based on 4 years of previous funding, this platform approach has demonstrated that cost-competitive and high-performance additives for wood coatings and stains can be derived from soybean oil. The global wood coatings market is forecasted by Freedonia to grow by 4.5% annually and reach $4.8 billion in 2018 with North America the largest segment where Rust-Oleum is one of dominant companies.
1st Source – Leveraging two years of previous funding that demonstrated soy-based additives for the epoxy market are viable. Epoxy additives will benefit from the Trump administration proposing a trillion dollars of infrastructure work per Bloomberg, where epoxy coatings play a key part in providing protection to roads, bridges, airports and other public and private works.
GA Southern – Previous funding has shown that anchoring antimicrobial compounds to soybean oil molecules creates novel structures which can be applied as additives to Acrylics, Latexes, Epoxies and Polyurethanes coatings. Global antimicrobial coatings consumption was at 822 M lbs. in 2015 according to Grand View Research and growing at a rapid pace - 10.4%, with hospital-acquired infections one of the reasons. Current petroleum based technologies leach out of a coating reducing effectiveness and causing environmental concerns.

2: Value Impact

Soy’s unique combination of hydrophobicity (water resistance), solvency and flexibility are displayed in all three activities and will drive soy consumption.
Rust-Oleum - Rust-Oleum, (Do It Yourself market of interior and exterior wood stains), will leverage the technologies with their sister company RPM Wood Finishes Group (OEEM wood coating supplier). Consumption, based on replacement of current Rust-Oleum formulations, is at one million bushels of soybean in two years, 2.85 million bushels of commodity soybean in five years with expansion into other Rust-Oleum lines and the Wood Finishes Group to be determined.
1st Source - First commercial products with industrial partner Ethox Chemicals are scheduled to enter the market at the end of 2017, with consumption at the five year mark at 566,000 bushels split between commodity and high oleic soybean oil. As part of this proposal, 1st Source will investigate high oleic soy oil to increase durability of the soy additives, which was identified as a need from the previous USB funding results.
GA Southern - Current results have demonstrated in head to head testing antimicrobial killing efficiencies were similar with the soybased additives, showing the advantage of zero biocide leaching creating long-term effectiveness and elimination of the environmental concerns. Consumption could range between 700,000 to 3.6 million bushels of commodity soybeans and there is evidence that this could expand to 7 million bushels at a 10% penetration rate in the later years at the five year commercialization point.

3: Execution Feasibility

As all three proposal have previously received USB funding and the vast majority of technical challenges have been solved and are advancing into scale up activities with industrial partners identified in the activities.
Rust-Oleum – The base technology has been proven in the first four of years of funding. Polymer exemption status, required by the EPA, additionally scale up parameters, process optimization and finalization of stain formulation are very manageable by Rust-Oleum and partners.
1st Source – The chemistry has been proven in the first two years of funding. Ethox Chemicals is the commercialization partner and very capable to complete this work. The remaining technical and market obstacles are straight forward and don’t pose any major risks.
GA Southern – The chemistry has been established and only scale-up uncertainties remain that can be resolved between the PI and Herty. Troy Corporation will be utilized for the EPA regulatory approvals needed for scale up and sampling.
PROPOSAL ON A PAGE

POP Name: Industrial Automotive
Short Name: Automotive
Proposal #: 1840-362-0742
Requested Budget: $1,007,334
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY

This POP encompasses five individual activities related to the automotive industry that address the Industrial Uses - Oil Roadmap, stages 2, 3, 4: BioSynthetic – Activity A, Goodyear – Activity B & C, Lear – Activity D and Ford – Activity E. These activities are not interdependent but are critical to achieving the milestones which are increasing the utilization of commodity soybean oil by 100 million pounds in FY18 and achieving one billion pounds of U.S. high oleic soybean oil utilization by 2021. There are many opportunities for more end users to utilize both commodity and HOSO in automotive applications such as motor oil, tires, seating/head & arm rests, etc. Leveraged funding Activity A - $665,000; Activity B - $300,000; Activity C - $150,125; Activity D - $550,000, Activity E - $36,000.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Biosynthetics has developed and is scaling up engine oils based on HOSO and are now looking to expand into other lubricant applications and other new areas such as emulsifiers and polymeric components. Lubricants in wind turbines would open new opportunities for U.S. soybeans in various lubricant applications. Attainment of lubricant, emulsifier and polymeric component certifications will enable manufacturers, distributors and formulators to use specialty chemicals made from U.S. high-oleic soybean oil as a feedstock/ingredient in their final products. Goodyear, as the second largest North American producer of tires for passenger car and light trucks, is well-positioned to research & utilize both U.S. conventional and HOSO soybean oil as a feedstock. Goodyear’s initial introduction of the use of conventional soybean oil could find usage in other rubber applications increasing demand and improving the value of SBO. High oleic soybean oil is a structurally uniform molecule which should optimize performance by providing consistency and feedstock uniformity. Lear is an international company supplying new technology in seating, headrests, etc. to the auto industry around the world. Lear has 234 locations in 37 countries around the world. Ford has two product areas focused on rubber applications in the engine compartment and tire rubber for OEM tire applications. These two current opportunities will help to grow the use of high oleic soybean oil (HOSO) to 23 million lbs. (oil from two million bu.) per year by FY2021.

2: Value Impact

Biosynthetics - The demand for lubricants used in the wind energy industry will increase from 37,600 MT in 2015 to 53,700 MT by 2020 (Kline market research report). This would require 1.5 MM bu. of high oleic soybeans. Goodyear global tire sales in 2016 was 166.1 million tires which represents a potential of 365,420,000 lbs. of soybean oil from 32,338,053 bu. of soybeans. Their first commercialization will be in the U.S. with an all-season tire to be introduced in late 2017. This single product line could consume 440,000 lbs. of soy oil from 39,000 bushels. Lear in North America presently consumes 4.4 million lbs. (0.4 million bu.) of soy polyol in polyurethane foams for seating and interior trim and looks to increase that by using new soy technology and transferring the formulation technology into European and Asian automotive vehicle seat production. Based upon the American Chemistry Council’s estimate of about 25 lb. of foam in the average automobile/light truck, polyurethane foam required for 65 million vehicles produced in USA, EU, and China would use 810 million lbs. of polyol. Ford will research the use of HOSO in automotive rubber applications to identify the potential performance benefit in high heat use environments like under the hood.

3: Execution Feasibility

Biosynthetic Technologies collaborators will include CHS Inc. (HOSO from Monsanto/ADM), Regis (synthesis optimization), Albemarle (manufacturing scale-up) and various testing labs to conduct application specific performance evaluations. Goodyear works closely with automotive OEMs, such as Ford Motor Company, on various projects which seek to utilize soybean-based products in synthetic polymers. Lear has a proven track record of developing and delivering new technology around the globe. Ford is the second-largest U.S. based automaker and the fifth-largest in the world. Leveraged funding Activity A - $665,000; Activity B - $300,000; Activity C - $150,125; Activity D - $550,000, Activity E - $36,000.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE
Proposal Name: Higher Blends in Oilheat Markets
Proposal #: 1850-361-0768
Short Name: Bio Blends
Link to full proposal:
Requested Budget: $135,201
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY
USB wants to increase demand for U.S. soy in Bioheat and to do so, heating oil distributors need to increase Bioheat blends. If heating oil distributors increase levels of Bioheat in their blends, they would be in a better competitive position to maintain market share, due to its environmental-friendliness, and U.S. soybean farmers would expand their market for soybean oil in that sector. However, very few distributors have voluntarily increased blends to date. They are lacking the clear incentive to do so. This proposal will develop and share information with oilheat distributors to encourage increased Bioheat blends through a market advantage over their competition.

Section B. EVALUATION CRITERIA

1: Strategic Importance
Successful completion of this proposal will help increase the utilization of soybean oil in heating oil, a growth market for U.S. soybean oil. Currently Bioheat utilizes over 900 million pounds of soybean oil and has the potential to use 1.8 billion pounds by 2021. This proposal is part of that conversation that will make this milestone a reality. Most blend level minimums are set by government mandates, with the goal of reducing carbon emissions, but there is the opportunity for higher blends now. For example, in New York City, local law requires heating oil blends of 2 percent biodiesel (B2) which will increase to 5 percent in October 2017 and eventually 20 percent by 2034. The oil heat distributors have the infrastructure to increase blends today and increasing their blends of Bioheat can provide both a competitive advantage for the distributors and benefit soybean oil demand.

2: Value Impact
For the checkoff to reach its 1.8 billion pound Bioheat milestone by 2021, there is an additional 900 million pound market for soybean oil Bioheat to be realized. That’s the oil from 90 million bushels of soybeans – just for the Bioheat market. This proposal will bring that push for more soy-based Bioheat to the forefront. This proposal goes beyond just generating increased Bioheat use in the Northeast. It increases the amount of soybean oil used there. By sharing the total Bioheat value equation with distributors, the checkoff will push adoption of higher blends and ultimately get buy-in without relying on just mandates. This proposal also presents the opportunity to strengthen important relationships in the oil heat industry through face-to-face interaction.

3: Execution Feasibility
Many Oilheat businesses are generational and span decades. We’re asking a business to change their operation, not because they have to – but because it’s a marketing edge. This type of conversation can be difficult and will take time and effort. This proposal works closely with the National Biodiesel Board and their established efforts related to Bioheat. By working together in a partnership effort, this provides additional resources to be used in the OilHeat market and helps to build relationships that will sell more soy in the future.

Section C: SPECIAL CONSIDERATIONS (optional)
- Not applicable
Section A: PROPOSAL SUMMARY

Many industrial end users of soy aren’t aware of high oleic soybean oil’s benefits and in many cases don’t fully understand the benefits of commodity oil. To help overcome these barriers, this proposal is a targeted sales marketing effort to 1) build awareness for and; 2) stimulate trial and adoption of soy ingredients among industrial product researchers and manufacturers. In order to put high oleic and commodity soybean oil front and center with key industrial decision makers, it includes a website focused on selling soy’s attributes to key markets, targeted trade media outreach and an elevated tradeshow presence to market soy as the premiere biobased ingredient on the market. This proposal will take a heavy emphasis on promoting high oleic soybean oil in areas where it has the largest opportunity for adoption. In addition, this proposal also aims to escalate market awareness and adoption in high volume industrials markets including plastics, paints and coatings, lubricants and rubber. This proposal is interdependent with the POP titled Trade Shows & TAP Meetings.

Section B. EVALUATION CRITERIA

1: Strategic Importance

In order for industrial end users to view soybean oil as a viable alternative to petrochemicals, they must first know of soy’s characteristics and the portfolio of soy products available on the market – including high oleic soybean oil. This proposal is strongly focused on priming the market for use of high oleic soybean oil in industrial markets. The checkoff has a goal of 1 billion pounds of high oleic soybean oil use by 2021. This proposal helps put high oleic, as well as commodity oil front and center with key decision makers in industrial use markets. The purpose of this proposal is to sell the attributes of soy in the industrial space – something that no one else is doing on soybean farmers’ behalf. Successful adoption of soybean oil technologies can add much-needed demand to the market and increase farmer profit opportunities.

2: Value Impact

An active sales marketing effort for oil in industrial uses is critical to reaching USB’s preference and volume goals. This effort is the bridge between the checkoff’s research and technical learnings and the actual trial and usage of soybean oil by high volume end uses. Because high oleic is a new oil product, actively selling the benefits will help USB move towards its 2021 1 billion pound goal. Targeted outreach will contribute to market penetration in segments identified as having high volume, including lubricants (99 MM lbs. HOS), plastics (74 MM lbs.), asphalt (140MM HOS), coatings (96 MM lbs.), foam (56 MM lbs.), rubber (100 MM lbs.) and cosmetics. The effort will bring value through stimulated interest and sales lead generation that will expedite new trials, adoption and demand.

3: Execution Feasibility

Convincing an organization to make an ingredient shift is not easy – but completely possible. The checkoff has been successful before, but it takes a concentrated, targeted effort like this proposal. The key insights into this audience is price and functionality. The tactics in this proposal will focus on what’s in it for them to showcase soy’s attributes. Industrial applications of soy are not a one-size-fits-all solution. This proposal takes those nuances and technicalities into consideration and will sell soy’s attributes based on the market sectors.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

This POP is designed to support two individual activities that address the Industrial Uses – Oil Roadmap, stage 4: Activity A - Biobased Outreach and Activity B - Environmental Regulatory and Sustainable Procurement. These activities are not interdependent but are critical to achieving the milestone which is increasing the utilization of soybean oil for industrial applications by 100 million pounds in FY18. These activities will increase the demand for products made from U.S. soy by building on and strengthening relationships with federal and other governmental purchasers and manufacturers using soy as a feedstock. The federal government’s purchasing is strategically important since the government states it has more than $445 billion in annual purchasing power that includes procurement for more than 360,000 buildings and 650,000 fleet vehicles.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Soy is identified as one of the primary domestic first generation agricultural feedstocks used in the production of biobased products (Golden, et. al., 2015). Strengthening relationships with government purchasers, including land-grant universities, product manufacturers, and third-party standard setting organizations is critical to success in maintaining and increasing sales of soy-biobased products. A 2015 report sponsored by the United States Department of Agriculture (USDA) estimated the total “value-added” contribution of the biobased products industry to the U.S. economy in 2013 was $369 billion ($126 billion coming from direct sales) and employment of four million workers. A 2016 follow-up report estimated that in 2014 the biobased industry contributed a total of $393 billion value added to the U.S. economy ($127 billion in direct sales) and employment of 4.2 million workers (Golden, et.al., 2016).

2: Value Impact

These activities bring value to U.S. soybean growers to take advantage of drivers, such as federal preferences for biobased as well as increasing demand for products that shrink environmental impacts. In January 2017, Unilever announced that U.S. and global consumers are committed to sustainable products and there is a more than $1 trillion market opportunity for brands that can effectively and transparently market the sustainability of their wares. This market presents opportunity as well as a challenge to U.S. soybean growers to drive the preference for U.S. soy as a high-performing and sustainable alternative to petroleum and other feedstocks in innovative high-value or high-volume products.

3: Execution Feasibility

These activities will build upon and be a continuation of previous environmental regulatory, communication, education and procurement efforts funded by USB in which key relationships with product manufacturers, government agencies, and third-party standard setting organizations have already been established.

Section C: SPECIAL CONSIDERATIONS (optional)
This POP encompasses three individual activities that address the Biodiesel/Bioheat Roadmap: Activity A - Biodiesel Cultivation, Activity B - Technical Support and Activity C - Alliance Opportunities. These activities are not interdependent but are critical to achieving the milestone which is increasing the utilization of soybean oil for Biodiesel by 135 million pounds in FY18. Industrial users lack information about the benefits of U.S. soy-based biodiesel that limits adoption. In support of USB's milestones to increase biodiesel fuel utilization these three activities address objectives C & D and provide a foundation of information (such as technical, environmental and economic research), as well as coordination, and outreach on these topics to petroleum companies, engine companies, pipeline companies, government agencies, Clean Cities Coordinators, etc. Activities will be carefully designed to ensure: 1) the U.S. soy industry will maintain the current market share of the biofuels sector; 2) end users are aware of biodiesel's beneficial carbon, quality and performance characteristics. Currently 21 QSSB's, NBB members, USDA, and the National Biodiesel Foundation provide a 3.8 to one match for every dollar that USB puts in the NBB program plan.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The biodiesel industry utilized 5.6 billion pounds of soybean oil in FY15/16 according to USDA or 25% of the soybean oil produced in the U.S. The biodiesel industry is very large with many diverse players from engine manufacturers to auto companies to pipelines to end users. All of them have different levels of knowledge and commitment to biodiesel. Communication, research, and education are the key to keeping these entities focused on biodiesel and NBB has a proven track record in continually increasing the knowledge and understanding of these groups and as a result of that increasing biodiesel utilization numbers and ultimately soybean oil usage. The successful efforts of this proposal will enable key partnerships to be formed. They include: biodiesel industry leaders and checkoff stakeholders; feedstock suppliers; equipment manufacturers and technology providers; petroleum supply chain gatekeepers; soy biodiesel users like railroads, trucking companies; growing regional markets and transportation energy influencers. With those partnerships in place, the soybean oil utilization in the form of biodiesel and bioheat will increase the farmer’s role in the growing US energy market.

2: Value Impact

The biodiesel industry has grown from 1.5-billion-gallons of demand in 2011 to 3 billion gallons of demand in 2016 utilizing approx. 5.6 billion pounds of soybean oil and per USDA that number is expected to grow to 6.2 billion pounds in 2017. In 2016 biodiesel return on investment for soybean farmers was .63 cents per bushel in extra value (Informa Economics). That translate into $33 per acre or about $2.7 billion in additional value to U.S. soybean farmers annually. Currently 21 QSSB’s, NBB members, USDA, and the National Biodiesel Foundation provide a 3.8 to one match for every dollar that USB puts in the NBB program plan.

3: Execution Feasibility

NBB has achieved two decades of successful research, education, outreach, coordination and industry support and is considered the most reliable source for biodiesel information and data. The best measure of NBB’s success is the increase in biodiesel sales from 20 million gallons in 2003 to 3 billion gallons in FY16. Marc IV Consulting has been leading force in the development and execution of technical, regulatory, economic, and policy aspects needed to get the biodiesel industry to the 3 billion gallon-per-year mark achieved in 2016. Karen Edwards is the principal of KCE Public Affairs Associates. She has worked for USB and NBB on biodiesel issues since 2001 and has more than 30 years of experience in Washington, D.C. and around the world. Karen is also an expert in biobased products made from soy.

Section C: SPECIAL CONSIDERATIONS (optional)

Soy oil's dominance in the biodiesel market is challenged by rumor, misinformation and incorrect categorization as conventional fuel. This effort works to establish soy biodiesel as the competitive and valued alternative fuel it is. Inaction will cause misinformation and gives power to those working to push soy out of the marketplace.
Sustainability Target Area
FY18 Final Portfolio

July 20th, 2017
Sustainability TA Portfolio Balance by Risk Reward

Value Creation Framework: FY18 Portfolio 7/20/2017
**Sustainability Target Area Portfolio Spend by Track**

- **Where to Play?**
  - NEW Customers/Value Chain
  - EXISTING Customers/Value Chain

- **How to Win?**
  - NEW Products & Production
  - EXISTING Products & Production

### New Volume
- **1%**

### Breakthrough
- **Differentiate US Soy**
- **30%**

### Existing
- **Existing Core**
- **69%**
Sustainability Target Area Portfolio Spend by Roadmap

% Spend by Roadmap

- Sustainable Production Practices: 67%
- Infrastructure: 1%
- Market Access: 32%
Sustainability Target Area Portfolio Spend by Program Maturity

Portfolio by Program Maturity (Proposal Stages)

<table>
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<th>Stage 3</th>
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Sustainability Target Area Portfolio Spend by Program Goal

- Infrastructure: 2% 
- Sustainability: 6% 
- Sustainable Production: 8% 
- Technology: 22% 
- Value: 36% 
- Unallocated: 26%
Sustainability Target Area Portfolio Spend by Audience

- End Users: 24%
- Public Researchers: 28%
- Regulators & Influencers: 17%
- Buyers: 9%
- Unallocated: 7%
- Farmers: 14%
- Input Companies: 1%

Value Creation Framework: FY18 Portfolio 7/20/2017
**Section A: PROPOSAL SUMMARY**

Herbicide resistance is an ongoing issue, but it’s not always top-of-mind for farmers unless they deal with problems arising from resistant weeds daily. USB will work to change that mindset from passive to proactive by reaching farmers where they are—on their smartphones. A farmer-facing mobile app is a new approach for the Take Action program. This innovative strategy will combine the familiarity of the successful program with a tactic to reach farmers in new ways and help them address the well-known problem of herbicide resistance. The proposed app will help farmers proactively manage herbicide resistance, combining the need for farmers to take steps to responsibly manage and prevent herbicide resistance on their farm while satisfying their desire to have resources available at their fingertips. Successful implementation of this proposal will result in increased awareness of the threat of herbicide resistance and use of this tool by farmers to proactively manage and prevent herbicide resistance in their fields.

**Section B. EVALUATION CRITERIA**

1: Strategic Importance

Weed management strategies that mitigate herbicide resistance are an important part of farmers’ sustainability management plans, and help USB achieve its sustainability goals as defined in the SSAP and by Field to Market. As farmers implement proactive diversified management strategies, they help to improve the lifespan of new herbicide technologies, minimize their environmental footprint and throw fewer hits to their pocketbooks. Plus, proactive weed management supports U.S. soy’s sustainable marketing advantage.

2: Value Impact

This proposal addresses herbicide resistance by putting a management tool right in farmers’ hands. Herbicide resistance actively threatens farmer profitability and has the potential to cost farmers more than $43 billion in annual crop losses if existing chemical weed control tools are lost. Through ongoing Take Action digital advertising efforts, the term “take action app” is a search phrase that has been linked with user visits to the Take Action website, with 100 searches per month on average. The app will be made available to farmers at no cost and will help them make proactive weed-management decisions and potentially reduce their herbicide costs through the selection of appropriate, effective herbicides for their farm. This app will translate to an increased number of farmers implementing a proactive, diversified weed management plan to slow the development of resistance to herbicides, decreasing the need for additional pesticide applications and increasing U.S. soy’s overall sustainability and progress towards industry-recognized sustainability metrics, like those in the SSAP and Field to Market.

3: Execution Feasibility

The checkoff has led the Take Action program for five years and maintains widespread support from industry partners, seen by many as an important, unbiased resource for managing herbicide resistance. The contractor has experience both in app development and the Take Action program. To optimize success of this investment, the checkoff will promote the app so that farmers are aware it exists and begin to use it. A promotion plan has been included with this proposal to make farmers aware of the availability of this free app.
Section A: PROPOSAL SUMMARY

Sustainability sets us apart. Continuous improvement keeps us ahead. These statements have been the central theme of USB’s sustainability messaging to farmers for two years. Sustainability is a differentiating factor that U.S. soy currently has over its competitors. U.S. soybean farmers must continue to innovate and improve to maintain this advantage. However, sustainability is not a one-size-fits-all proposition. It looks different for every farmer, though there are many overarching regional practices that can be applied at the individual farmer level to improve U.S. soy’s sustainability overall. Through this proposal, USB will work with QSSBs one-on-one to identify and transfer in-depth information on sustainable practices appropriate to their respective regions that will continue to give U.S. soy a leg up in the global marketplace. USB will partner with QSSBs to build and implement custom sustainability communications plans. Improvements in sustainability at the farm level may seem small but when combined with soybean farmers from all over the country, the industry will see positive changes in the aggregate level of sustainability related to the industry-recognized goals of the SSAP and Field to Market.

Section B. EVALUATION CRITERIA

1: Strategic Importance

U.S. soybean farmers must continue to innovate and improve to maintain demand for U.S. soybeans. Encouraging the adoption of regionally-appropriate best management practices will enable farmers to continue meeting the sustainability expectations of our end users and increase market share. Working with QSSBs is one way to ensure that regionally-appropriate messages reach farmers regarding sustainable practices that are best suited for their area.

2: Value Impact

QSSBs are a valuable partner for increasing adoption of regional sustainable production practices. USB will spearhead a program that transfers the universal ideas of sustainability through the practices that will make the biggest sustainability impact per region or state. This customized partnership will support the adoption of the regional practices that improve sustainability on a farm-by-farm basis and contribute to raising the aggregate sustainability of U.S. soybeans to meet industry-recognized sustainability goals in the SSAP.

3: Execution Feasibility

From 2009-2016 USB funded a similar program to work with QSSBs on production issues, which produced a variety of state-specific production resources. The proposed program will take a similar approach that has been proven effective. Last year USB staff implemented a campaign which raised the awareness among farmers of their contribution to a sustainable soy crop by more than 10 points from the year prior. Partnering with QSSBs will push greater adoption of sustainable practices, in addition to awareness of their current contribution to the sustainable soy crop. USB staff have a long history of partnering with state soybean boards on numerous issues and maintain positive relationships with QSSB staff. USB staff will use those relationships to successfully implement this proposal.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

To be able to exceed the expectations of our end users, soybean farmers must adopt management practices that improve the sustainability performance of their farm. Because there is no “one size fits all” solution to improving sustainability performance, this proposal offers a state-by-state and regional viewpoint for driving practices that will make farmers more sustainable over time to maintain their competitive advantage. To do this, USB will partner with QSSBs and university soybean specialists to extend USB’s sustainability outreach. The proposals provide communications partnerships and materials to help QSSBs promote specific sustainable production practices that align with 1) local challenges and 2) improving industry-recognized sustainability metrics (like those supported by the SSAP and Field to Market). U.S. soybean farmers will see long-term benefits from improved sustainability performance, which will allow them to continue to position themselves to best meet the demands of their customers.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Many major users of soy have made commitments to purchase all or a portion of their product ingredients from sustainable supplies. U.S. soybean farmers can deliver on these demands now but the status quo will not be enough long-term. Encouraging the adoption of regionally appropriate management practices will enable us to meet the sustainability expectations of our end users. In addition, U.S. soybean farmers benefit from increased demand for sustainable soy and increased long-term profitability.

2: Value Impact

Not addressing sustainability is not an option for U.S. soybean farmers. End users will look to other feedstuffs and oil sources if soybean farmers cannot meet their sustainability requirements. In order to meet end user needs, U.S. soybean farmers need to keep demonstrating sustainability improvements. Through this proposal USB will work closely with state checkoff partners to share sustainability messages and encourage adoption of practices most relevant to farmers in the state, such as efficient irrigation or best practices for cover crops. Leveraging QSSB communication channels, like their magazines, newsletters, farmer meetings and field days, amplifies USB’s sustainability messages in an efficient way and allows for more specific coverage of regionally-appropriate messages. Individual changes on the farm contribute to greater sustainability at the national level and help meet end user needs.

3: Execution Feasibility

Last year USB implemented a campaign which raised the awareness among farmers of their contribution to a sustainable soy crop by more than 10 points from the year prior. USB is committed to supporting state soybean staff in ways that best meet their needs to increase adoption of sustainable production practices and continue meeting end user needs. USB has a long history of partnering with state soybean boards on numerous issues and maintain positive relationships with QSSB staff.

Section C: SPECIAL CONSIDERATIONS (optional)

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This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Section A: PROPOSAL SUMMARY

Pesticide resistance development is a major threat to current and future crop protection tools. Proactively managing this resistance is in the best interest of farmers for both profitability and sustainability reasons. However, understanding pesticides, how they work and how to use them in a way that lessens the risk of developing resistance can be confusing and time-consuming. To help with this, we created Take Action. The Take Action program has successfully provided a platform to address herbicide resistance for five years. The program expanded to include fungicide resistance and will eventually include insecticide resistance, too. Take Action’s neutral, broad-based platform benefits not only farmers but the partners that support farmers. Because many farmers turn to trusted advisors, like their local ag retailer or chemical company representative, to assist with this decision making, we have the opportunity to expand partnerships with the industry, especially ag retailers, to make Take Action even more impactful. Strengthened partnerships mean even greater awareness of the management practices for delaying or preventing resistance development promoted through the Take Action program, which in turn leads to long-term sustainability improvements.

Section B. EVALUATION CRITERIA

1: Strategic Importance

The mission of the checkoff is to improve profit opportunities for all soybean farmers. Pesticide resistance is both a direct and indirect threat to those profit opportunities. At the farm level, pesticide resistance reduces profit from reduced yield and additional pesticide applications. But at the macro level, pesticide resistance is a threat to U.S. soybean sustainability, as crop protection tools become ineffective and additional pesticides or practices are needed to control yield robbers. This is an advantage U.S. soy has over its competitors, particularly South American farmers who must apply greater levels of pesticides to produce a crop. Soybean farmers all over the country have faced varying degrees of herbicide resistance for years. Fungicide and insecticide resistance are also problematic for farmers, and while not currently as severe as herbicide resistance, they hold the potential to be just as severe if not addressed now.

2: Value Impact

Pesticide resistance can be extremely costly for soybean farmers – herbicide resistance alone costs soybean farmers billions each year. Soybean farmers see less loss from fungicide and insecticide resistance but as the problems grow in severity so too will their economic damage. And without proactive management, no acres are safe from resistance development. But using a proactive, diversified management strategy can help keep resistance development at bay and prevent additional costs of pesticide applications or loss of yield. Because ag retailer advisors have so much influence, it’s important they consider proactive resistance management to help U.S. soy preserve important technology and its sustainability advantage.

3: Execution Feasibility

The Take Action program has been successfully implemented for five years. Although this proposal will reach audiences not heavily targeted by USB in the past, ag retailers are an important audience as they help farmers make their plans to prevent resistance, and this proactive approach is important before resistance starts to show up. The proposed methods for reaching ag retailers are standard practices for reaching this group and have been proven successful. Minimal challenges are expected when creating a Take Action advisory council, as many partner companies and technical experts have already expressed interest in participating.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

Pesticides are an important tool in modern crop production, but the development of resistance to these pesticides is becoming a serious threat to farmer profitability. The increasing complexity of pesticides, regulations, new tolerance traits and more makes managing pesticides, and preventing the development of resistance, incredibly challenging. To help farmers maintain the effectiveness of these tools, USB will break down pesticide management with resources, materials and communication on the use of management strategies to mitigate the development of resistance to pesticides. This will be done through the continued implementation and growth of the successful Take Action program. USB will partner with university research experts to develop and disseminate resources. Successful implementation of the tactics outlined in this proposal will result in increased awareness of pesticide resistance, including increased adoption of proactive, diversified weed, insect and disease management strategies by farmers.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This proposal addresses farmer profitability and on-farm sustainability through the management of soybean pests and the maintenance of valuable crop protection tools. Economically- and environmentally-responsible pest management strategies play a role in U.S. soy’s sustainability by maximizing the lifespan of pesticide technologies that take 10 years or more and millions of dollars to develop and by reducing farmers’ environmental footprint with fewer passes made because they are using the most effective chemical strategy the first time. Finally, and perhaps most importantly, this keeps money in farmers’ pocket because they are using the most appropriate pest management strategies for their farm and the environment. This proposal addresses an important objective in the LRSP aiming to increase the number of farmers who implement diversified management plans to delay the development of resistance to herbicides, fungicides and insecticides, and therefore, contribute to U.S. soy’s sustainability.

2: Value Impact

All soybean farmers deal with weed, insect and disease pressures. Without the option of using pesticides, U.S. soybean farmers would see more than $43 billion in annual yield loss due to the lack of chemical weed control alone, according to the Weed Science Society of America. This figure does not account for the yield loss that would be realized without the use of fungicides and insecticides used to treat disease and insect pests in soybeans. Pesticides are an important tool available to farmers for weed, insect and disease control and the financial risk of not taking action to address managing the issue of pesticide resistance is much greater than the cost of helping farmers manage and prevent future resistance. Take Action provides farmers with unbiased resources and the access to expert knowledge to actively prevent the issue of pesticide resistance development on their farms. Because Take Action is an industry wide program, USB receives additional value through its partners’ extended distribution of the messaging and materials. Tackling pest management and resistance management is necessary for continuous sustainability improvements.

3: Execution Feasibility

Through Take Action, it’s feasible to continue to increase the percent of farmer proactively, diversifying their pest management practices. The soy checkoff has led the Take Action program for five years and have developed numerous resources, such as the Herbicide Classification Chart, which are updated as needed to reflect the changing industry. Strong partnerships established between USB staff and university research and extension staff around the country will facilitate the development of factually-correct but easy-to-use resources. Previous and ongoing research on many aspects of pest management provides a wealth of information from which to share research results with soybean farmers. In this proposal USB will also partner with the American Soybean Association to promote the management principles of the Take Action program and further extend the program’s reach.

Section C: SPECIAL CONSIDERATIONS (optional)
Herbicide-resistant weeds continue to spread and challenge the profitability of soybean farmers, costing nearly $1.9 billion in additional control costs. This proposal is focused on the short- and long-term management strategies for problematic weeds such as glyphosate-resistant Palmer amaranth and waterhemp, and integrates new research and educational programs to address the use and stewardship of new technologies such as 2,4-D (Enlist), dicamba (Roundup Ready Plus Xtend), and HPPD (Balance GT and MGI) and cover crops. This program combines the research activities of Activity A - Research to Integrate Best Management Practices for Glyphosate-Resistant Weeds in Soybean Production Systems ($512,186) with the educational programming of Activity B - USB Multi State Herbicide Resistant Crops and Weeds ($316,481). The overall goal of this project is to refine the strategies that can be integrated into regional Best Management Practices (BMPs) for weeds to sustain soybean production and profitability. The directors requested moderate to innovative approaches in this area and competitive proposals. This effort combines research and extension efforts to manage herbicide resistant weeds and effectively implement new herbicide technologies using moderately innovative approaches.

Section B: EVALUATION CRITERIA

1: Strategic Importance
One of the major factors threatening the sustainable production of soybeans is the development of weed populations that are resistant to glyphosate and multiple other herbicide modes of action. This proposal seeks to link diverse farmer audiences to the seed company and agrichemical company technologies to effectively implement these technologies to combat herbicide resistant weeds. Good stewardship of these herbicide tolerant traits with new herbicide formulations and integrating their use with other weed control practices including cover crops and tillage will ensure the long-term viability of these control measures. Working with agricultural providers to provide farmers with better understanding of proper stewardship for these new technologies will connect USB with the commercial companies and the better control of herbicide resistant weeds will help ensure soybean production sustainability. This program provides farmers with effective means of addressing one of the most prevalent production problems they face and effectively develops best management practices for improved sustainability as outlined in the Sustainable Production Practices roadmap and the LRSP.

2: Value Impact
To date 32 species have developed genetic resistance to glyphosate and 14 of those species are found in the U.S. Eight of those species are major threats to soybean production (Palmer amaranth, waterhemp, common ragweed, giant ragweed, marestail/horseweed, goosegrass, Italian ryegrass and Johnsongrass.). A new herbicide site or mode of action has not been introduced by industry in 30 years. This is mainly due to the fact that glyphosate-tolerant crops, introduced in 1996, have dominated planted acreage since that time, representing over 92% of the soybean acreage. A conservative estimate of the impact of herbicide resistant weeds is $20 per acre in additional herbicide costs to control these weed populations, or nearly $1.9 billion in added costs to U.S. soybean producers. The effective deployment of new seed and herbicide technologies along with effective cultural controls will help address this huge production problem and make U.S. soybean production more profitable.

3: Execution Feasibility
Both the research team and the extension team have been in place for over five years. The extension team was involved in the development of the Take Action program and continues to serve in a technical advisory role for the program. The integration of the research portion of this program that is aimed at evaluating and developing effective weed management systems that integrate new technologies with cultural practices with the extension education program is critical to the effective adoption of these practices by farmers. The personnel involved in this project each have support within their state for their research and extension programs in the nine states represented. A conservative estimate of the funding devoted to this effort by the states involved is $278,000. For the first time this program also has access to all the new herbicide tolerance technologies (2,4-D (Enlist), dicamba (Roundup Ready Plus Extend), and HPPD (Balance GT and MGI)) to evaluate the most effective way to implement these technologies in a comprehensive weed management program. This represents a significant commitment from commercial companies.

Section C: SPECIAL CONSIDERATIONS (optional)

This program represents the backbone of the Take Action Herbicide Resistance Management program. This is the first time that the researchers and extension specialists have been able to evaluate all the new soybean herbicide tolerance technologies.
PROPOSAL ON A PAGE

POPN Name: Genes for resistance to nematodes
Short Name: Nematodes
Proposal #: 1820-172-0117
Requested Budget: $591,218
Last Gate Score, if applicable: 0117

Section A: PROPOSAL SUMMARY

This POP supports the Sustainable Production Practices roadmap aimed at identifying new sources of pest resistance.

Soybean nematodes are the top yield-robbing pest facing farmers, but there are very limited sources of resistance available to them and, increasingly, nematodes are overcoming resistance in the field. This program aims to discover, develop and deploy new genetic resistance to the most important nematode pests in the US, Soybean Cyst Nematode (SCN), Root Knot Nematode (RKN) and Reniform nematode (RN).

This program covers three stages of research: investigation, validation and application. The innovation level is primarily moderate, with some innovative and conservative efforts.

This program leverages data and resources developed with USB, NCSRP and QSSB funding.

Successful completion of all aspects of this program will give growers multiple new options for combating nematodes.

This program covers three stages of research: investigation, validation and application. The innovation level is primarily moderate, with some innovative and conservative efforts.

Activity B - Rhg1, cq5SCN loci and epigenetic determinants of resistance to soybean cyst nematode ($213,436), and Activity C - Evaluation of the joint effect of Arabidopsis PSS30 and soybean GmDS1 genes in providing SCN and SDS resistance in soybean ($119,120). These 3 activities are interdependent and together comprise a program for research and development of new genetic solutions for nematodes in soybean and are a part of the critical path to address the technical solutions track within the Sustainable Production Practices roadmap.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This POP directly addresses the LRSP goal of creating germplasm containing new genetic sources of resistance to soybean diseases.

It is a comprehensive program to develop new genetic resistance and germplasm to combat the number one yield robber in soybean, SCN as well as RKN and RN. The program includes coordinated field breeding efforts for MG 0-VIII, advancing lines with new and proven sources of nematode resistance, using molecular markers to look for novel sources of nematode resistance from the germplasm collection, and moving promising lines into breeding populations.

It also includes investment in understanding how to best manage and expand durability of resistance from PI88788, this resistance is the most successful source of SCN resistance and is present in over 90% of nematode resistant varieties grown in the US.

Lastly, it is well documented that there is a connection between SCN and SDS in that the diseases often show up together, so lines with resistance to both are particularly attractive. One component of this program is to combine two novel genes in soybean, one for SCN resistance and the other for SDS resistance, both have shown promise in isolation. If successful, these could be combined in soybean in conjunction with other nematode resistance genes in a manner that would not currently be considered to be a GMO.

Successful completion of one or more approaches in this program will offer growers new, much needed choices for sustainably combating nematodes.

2: Value Impact

These activities will create value for US soybean growers by protecting and preventing yield loss due to SCN, RKN, RN, and SDS. Yield loss from SCN alone is estimated to be over 120 million bushels/year, which could become much greater as nematodes continue to overcome PI88788 resistance.

If 100% of the losses to all three nematodes and SDS are mitigated, there would be an increase in US soybean yields in excess of 160 million bushels/year.

If only 10% of the loss is mitigated the increase in yields in the US will be over 16 million bushels/year.

These gains may be reduced by increased cost to growers for seed technology fees.

3: Execution Feasibility

This program is supported by significant preliminary work and the researchers are experienced with the methods proposed. No specific technical hurdles are anticipated. However, because this is research in biological systems, there are no guarantees the results obtained will be the results desired (i.e. will they find durable resistance equal to or better than PI88788 in a natural soybean line).

The market is ready and in need of new sources of nematode resistance, implementation and adoption should be straightforward as many growers already are aware of nematode problems and choose to grow varieties with SCN resistance.

This program leverages funding from several sources to support the personnel and related programs as well as data and resources generated from previous USB funded programs ($260,000 from QSSB, $170,000 from NCSRP and $180,000 from state and private sources).

The Pls of the activities have a history of delivering results to USB and are fully capable of executing the work. In prior efforts 26 nematode resistant cultivars have been released, 59 MTAs have been signed with commercial and public breeders, patents for new discoveries were filed and highly cited publications in top tier journals have been developed.

Section C: SPECIAL CONSIDERATIONS (optional)
PROPOSAL ON A PAGE
POP Name: Improving Soybean Drought Tolerance
Short Name: DroughtTol
Proposal #: 1820-172-0118
Requested Budget: $870,640
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY
US soybean sustainability is constrained by widely fluctuating yields due to drought. Soybean genotypes have been identified that wilt more slowly, have higher water use efficiency (WUE), have cooler canopy temperatures, and fix larger amounts of nitrogen than any germplasm previously discovered. A novel source of superior ‘water use efficiency’ was discovered recently in the field and will be evaluated in the field as will the potential for deploying a limited transpiration gene. Each of the three activities represented by this POP (Activity A - Utilizing genes from the soybean germplasm collection to mitigate drought stress ($424,834), Activity B - Improving drought adaptation by insertion of limited transpiration trait into soybean varieties in the upper Mid-South of the US ($50,806) & Activity C - Yield potential of commercial varieties under drought - identifying and overcoming weaknesses through public breeding advances ($395,000)) address key factors related to drought tolerance that have been supported by USB for a number of years and offer significant opportunity to help mitigate the $127 billion loss in soybean yield due to drought over the past ten years. They offer a significant opportunity to build on the utility of identified molecular markers, determine the stability of these traits across extremely different environments, and pyramid favorable genes for each trait as well as stack these traits into improved germplasm lines for release and are moderately innovative. The activities meet the directors’ desire for moderate to innovative activities in this area and to leverage efforts supported by regional programs and QSSBs.

Section B. EVALUATION CRITERIA
1: Strategic Importance
Over the past 30 years there have been ten years when drought impacted over 20% of the U.S. soybean crop. One of the most viable options for mitigating drought is irrigation, but only 10% of U.S. soybean acres have irrigation capabilities. The only other means for sustaining soybean production in the face of drought is the development of drought tolerant soybean varieties. This solution is aimed at providing soybean farmers in drought-prone areas with a viable option for mitigating the impact of drought through allowing plants to survive an additional 3-5 days under severe drought stress compared to existing varieties. This additional drought tolerance often provides just enough protection to allow plants to survive until the next rainfall event. Drought tolerance improves sustainability of the U.S. soybean crop by reducing market volatility and protecting farmers from catastrophic crop loss. This program directly addresses the USB LRSP through the development of new genetic resources to protect soybean yield. This effort builds strategic partnerships with four commercial seed companies that have agreed to support and participate in the program.

2: Value Impact
Over the past thirty years drought has impacted between 3 and 59% of U.S. soybean production annually. During that time there have been ten years in which 20% or more of the U.S. crop was affected by drought. Economic value of losses in those ten years amounted to $127 billion. Direct impacts of drought on soybean farmers as reflected by crop insurance payments have ranged from $75 million in 2009 to $1.8 billion in 2012 and have totaled $4.8 billion on 44 million acres over the past decade. Although irrigation represents the major management practice for mitigating drought, currently only 10% of U.S. acreage has irrigation capability. Over the past twenty years, commercial seed companies have conducted breeding research addressing drought, but evaluations 15 years ago suggested that nearly all commercial varieties were susceptible to drought. More recent evaluations have indicated that some commercial varieties do have better drought tolerance. There is still interest among commercial companies in developing more drought-tolerant soybean varieties, as evidenced by their interest in this program.

3: Execution Feasibility
Two of the research teams represented in this POP have been involved in soybean drought research for over 15 years. Dr. Purcell is a preeminent soybean physiologist who is respected throughout the scientific community. Dr. Carter provides leadership to one of the most successful public soybean breeding programs in the country and is respected throughout the world as one of the leading soybean geneticists. Their past efforts have resulted in the identification of key trait targets for the development of drought tolerant soybean germplasm. The Carter activity has commitments for collaboration and interest in germplasm developed from Bayer Crop Science, DuPont Pioneer, Monsanto and Progeny Ag Products. These relationships will speed the development of drought tolerant soybean varieties for use by farmers.

This activity has support from the following QSSBs:
- Arkansas Soybean Promotion Board $80,000
- Mississippi Soybean Promotion Board $24,900
- South Carolina Soybean Board $20,000
- Georgia Soybean Commodity Commission $15,000
- North Carolina Soybean Producers Association $27,500
- Missouri Soybean Merchandising Council $30,000

Dr. Shekoofa is a new scientist at the University of Tennessee. Her activity is to screen existing germplasm (100 lines) for the presence of a limited transpiration gene, using both physiological and gene marker screening. The results of the first phase of physiological screening will be used to identify markers that will be used in the second phase of genotypic screening. The identification of the markers hinges on the success of identifying the trait with the physiological screening.

Section C: SPECIAL CONSIDERATIONS (optional)
This program was not funded in FY17 and the researchers split their efforts into two separate activities. We have combined them since ultimate success hinges on the success of both these activities as they are essentially interdependent.

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The overall USB program budget for FY18 is $69.1 million, and the state checkoff programs together administer a similar budget. In addition there are four regional checkoff research programs that administer funds contributed by their member states to address regional soybean production issues. This total checkoff investment of over $138 million requires a significant amount of coordination to ensure that investments are well-aligned, avoid duplication, and realize their full potential. This proposal provides program staff with the capability of responding quickly to develop and implement short-term coordination activities that arise throughout the year. It also focuses on the development of a unified coordinated research plan across the checkoff family, which represents one of the key Sustainability Supply Milestones in the USB LRSP. Many of these activities are directly linked to opportunities that leverage additional funding from public or private industry. Included in this effort is support for administration of four regional checkoff programs and a database that summarizes all checkoff-supported research. A survey of the impact of soybean diseases and insects will provide direction for research. In addition, support is included for adding a quality contest to ten existing state yield contests.

One of the key milestones of the FY17-FY21 USB LRSP is the development of a unified soybean research strategy for USB, QSSBs and regional checkoff programs to ensure that all key research needs are being met and that checkoff funds are not being used to address redundant activities. This proposal addresses the development of a framework for coordinating checkoff family strategic research planning, and also includes support for a number of other coordination activities. Four regional checkoff programs administer funds provided by the QSSBs in their region to address soybean production issues relevant to their regions. This proposal provides support for the administrative activities of those regional programs to ensure that effective funding decisions are being made. In addition, this proposal provides support for the National Soybean Checkoff Research Database which tracks checkoff funding of research to help avoid redundancy of effort by providing information regarding research developments from projects funded throughout the checkoff family. Together these activities strategically guide checkoff funding of soybean research to provide the greatest return on investment possible.

Between USB and the QSSBs, the soybean checkoff will invest over $138 million during FY18. The investment represented by this proposal ($553,863) provides direction to these investments in a number of ways, including support for regional boards of directors to consider regional research projects, workshops to direct research teams funded by USB, Supply research investments, and administration of the National Soybean Checkoff Research Database that helps track research progress and investment, while providing a resource to help QSSBs, regional programs and USB to evaluate research that is already being conducted when considering new research program requests. If effective direction can be provided through this program for the $138 million checkoff program, then the $553K investment represents a 249:1 ROI. To make the greatest impact with checkoff investments it is crucial to vigilantly guard against redundancies and to responsibly manage investments in the best interest of the Board.

The coordination of research activities is critical to the effective investment of checkoff funds. It is impossible to make wise investments without knowledge and consideration of the current state of knowledge and also what investments are being made by other groups. Research Coordination has been very effectively managed for many years, particularly through support of regional checkoff research programs. An example would be the fact that the North Central Soybean Research Program (NCSRP) annually invests $3-$4 million in checkoff funds contributed by the 12 North Central states. The research projects funded by NCSRP have been very successful and improved soybean profitability for soybean farmers in the North Central region continually for over 20 years. This program provides administrative and technical support for all regional programs. The National Soybean Checkoff Research Database has been very successfully initiated and is being used by the QSSBs and regional checkoff programs as a repository of their research projects. This program has continued to expand annually for the past three years with more states taking advantage of the resource each year. There have been six meetings over the past two years designed to develop a research coordination strategy for improving direction for checkoff investment.
Section A: PROPOSAL SUMMARY

- Proposal addresses Sustainability Supply Roadmap to support production practices that sustain and improve long-term soil health and protect water resources.
- Main deliverable is management recommendations for optimal crop rotation systems in Mid-South where various rotational crops exist, given that soybean has become a more predominant crop in the South.
- Crop rotation offers roughly 10% average yield benefit versus monoculture providing an innate boost to profitability, if managed wisely.
- Innovation is introduced into this concept by researching various rotational crops, other than just corn, which is helpful to know for future consideration in other soybean growing regions.
- The proposal is leveraged 4:1 with the Mid-South Soybean Board (MSSB) providing the bulk of funding.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP in Sustainable Production in developing BMPs that improve soil health and conserve water resources.
- Addresses goal of Sustainability Supply Roadmap to develop a unified research strategy in partnership with regional check-off research programs and with QSSBs.
- Acreage of feed grains (corn, soybean, sorghum, wheat) has increased in Mid-South and farmers need guidance on benefits and effects of incorporating the various feed grains into their rotation. The results of this study may have implications in other areas of the soybean market.
- Proposal addresses effect of rotation and management of residue from various rotational crops on key components of production affecting sustainability such as soil nutrient content, shifts in nematode populations plus changes in weed, insect, and disease pressure. An economic assessment is also under way.
- Summary of results and recommendations will be provided to Extension and industry tech reps to share with growers and CCAs, and also to O&B for write-ups in USB updates and website.

2: Value Impact

- An economic assessment will quantify profitability of various rotational systems and associated residue management that has bearing for consideration on decision-making on rotations for all soybean growing regions.
- Assessment will look at further enhancing yield benefit of crop rotation (average 10% average yield benefit versus monoculture) which can provide an innate and natural boost to profitability.
- An average 10% yield increase due to crop rotation equates to 6bu/a per 60bu/a yield or roughly $60/a increase.

3: Execution Feasibility

- This is a joint project with the Mid-South Soybean Board (MSSB) that contributes $158,969 and the United Sorghum Check-off Program at $63,000, and is requesting of USB $51,050.
- The main research institution Mississippi State University has put together a team to address each of the disciplines involved: soil fertility, weeds, nematodes and pests, and economics.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

- The main deliverables are BMPs, development of control measures, and genetic resistance for two major diseases and one major pest of soybean – Cercospora Leaf Blight, Frogeye Leaf Spot, and Stinkbug Complex – which two diseases collectively cause over 30M bushel loss annually or $300M dollar loss, and stinkbugs can cause 15-25% average yield loss where present and seriously impair seed quality resulting in dockage at the elevator.
- Two years ago, proposed project inception came at request of USB and QSSB directors in the South fighting Cercospora incurring heavy yield loss given lack of any effective control measures; since then, Cercospora continues to spread north and east.
- A collaborative effort was formed to create this project split in cost between USB and MidSouth Soybean Board (MSSB) to devote additional resources to the control of Cercospora (and also Frogeye) beyond scope of KPIs in USB Foliar Disease project and to address stinkbug control which depends entirely on pesticides that increasingly are prone to pesticide resistance.

Section B: EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goals in Sustainable Production to develop BMPs and also resistant varieties to control two major diseases and one major pest of soybean.
- Addresses goal of Sustainability Supply Road Map to develop a unified research strategy in partnership with regional check-off research programs and with QSSBs.
- An outreach component seeks to fill Stage 3 of the Road Map, as it provides information and data for fungicide efficacy table for Osborn and Barr’s Take Action Disease website.
- Answers need to develop control strategies for Cercospora and stinkbug injury which are currently lacking and which the chemical and seed industry have not devoted resources given the complexity of the problem, yet would eagerly embrace.

2: Value Impact

- Development of BMPs, management recommendations, new control measures, and sources of genetic resistance germplasm help reduce yield loss from these diseases and stinkbug - which two diseases collectively cause over $300M dollar loss annually, and stinkbugs can cause 5-35% average yield loss where present and seriously impair seed quality resulting in dockage at the elevator.
- Use of foliar fungicides have become a widely used tool to increase yield and are often profitable and yet, pathogens/organisms are constantly adapting and new products being introduced which requires ongoing testing which this project addresses and thereby helps farmers stay abreast of fungicide efficacy.
- Investment in the project lays groundwork for seed industry to have resources and germplasm to develop in the future genetic resistance for Cercospora Leaf Blight and stinkbug complex, for which no resistance is currently available.

3: Execution Feasibility

- Proposed project is prime example of cross-collaboration between USB and regional check-off organization to combine resources and personnel to develop control strategies for diseases and pests where there is gap in the industry.
- For FY2018, MSSB has committed $160,000 and is requesting $160,000 of USB – which is even split of the $320,000 funding request.
- The respective QSSBs on project also contribute over $60,000 in leveraged funding.
- Significant progress has been made in 3 years to complex issues given collaboration of researchers, some of which have devoted entire careers in these areas.

Section C: SPECIAL CONSIDERATIONS (optional)

- The MidSouth Soybean Board (MSSB) has contributed and continues to contribute to joint projects in partnership with USB to address soybean production, agronomic, and pest issues.
- The proposed project augments the objectives and deliverables of the USB Foliar Disease project, as the two are collaborative and synergistic.
Section A: PROPOSAL SUMMARY

- The main deliverables are genetically resistant germplasm and perfect molecular markers for all the (Rps) races of Phytophthora root/stem rot, various species of Pythium seed rot, and Fusarium graminearum which is a newly emerging pervasive seedling disease.
- Greater control of these diseases would help ameliorate the yield loss, estimated to be 50M bushels annually or $500M dollar loss, and causing an average 15-20% yield loss in any one field where infection occurs.
- These deliverables are made available directly to private seed companies to expand the scope of genetic resistance to these pathogens, as currently the scope of resistance is quite limited.
- In this proposal, the project shows it has developed a mature pipeline with early innovations to well-developed innovations near hand-off to industry.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goal in Sustainable Production aimed at developing improved varieties for farmers.
- Addresses goal of Sustainability Supply Road Map to develop a unified research strategy in partnership with regional check-off research programs and with QSSBs.
- The germplasm and molecular markers developed from this project are made available directly to private seed companies to incorporate into elite varieties with a better defensive package against major seedling, stem and root rot diseases that is currently lacking in the industry.
- Addresses Sustainability Supply Road Map to cross collaborate with regional and state check-off organizations, and in this case, tie-ins with major USDA NIFA grants.
- The project proposal essentially serves as an applied outlet for the partnership with the large multi-million dollar USDA grant dedicated to identifying solutions through innovative basic research.

2: Value Impact

- Development of genetic resistance material and resources help control major seedling and stem/root rot diseases such as Phytophthora and Pythium that cause an estimated yield loss of 50M bushels annually or $500M dollar loss, and causing an average 15-20% yield loss in any one field where infection occurs, as well as avoid replanting that is costly in terms of time and inputs.
- Farmers benefit from high yielding varieties that contain strong defensive resistant traits for diseases that infect their area – in this case, the various species of these diseases infect most fields in most geographic areas, particularly during wet periods early season.
- Deployment of genetic resistance to diseases the early phase of soybean growth can mean less reliance on seed treatments that can be prone to fungicide resistance.

3: Execution Feasibility

- There is broad market appeal for improved genetic resistance to Phytophthora root rot and these other seedling diseases which are present on most acres to varying extent, thus control measures benefit farmers in all areas.
- Identifying new sources of resistance and markers takes time and patience and application of the latest biotech resources (that industry is reluctant to invest in) and yet this project has put together the experts, resources, tools, and partnerships to overcome the technical hurdles and regularly provide outputs.
- The proposed project is a multi-state/multi-institution team that involves support from USDA as well as Ohio, Iowa, and Missouri QSSBs close to $2.6 million and leverages with the $9.2 million grant with USDA-NIFA for Oomycete research, plus has tie-ins with related projects with the North Central Soybean Research Program (NCSRIP).
- It utilizes the talents of two USB Fellows and its associated support.
- Researchers at Ohio State have developed contracts with DuPont, Dow, and Bayer to identify new genetic sources.
- Licenses and MTAs have been granted to all major seed companies for the main sources of Phytophthora resistance over the last two decades.

Section C: SPECIAL CONSIDERATIONS (optional)

- This project complements the USB-NCSRP project on Seedling Diseases that develops BMPs, screening tools, and outreach components on numerous seedling diseases.
Section A: PROPOSAL SUMMARY

- The main deliverables are BMPs, development of control measures, and genetic resistance for five major foliar diseases of soybean – Frogeye Leaf Spot, Cercospora Leaf Blight, Septoria/Brown Spot, Soybean Vein Necrosis Virus, and Phomopsis Seed Decay – that collectively cause over 55M bushel loss annually or $550M dollar loss, and where any one disease can cause 10-20% average yield loss on infected acres.
- These diseases are found to be widespread and continue to spread such that three of the foliar diseases rank in the top 10 of soybean diseases, thereby impacting many acres and farmers.
- Foliar fungicides are currently widely used for control but have been showing signs of fungicide resistance, a key component that this project addresses.
- BMPs and genetic resistance have been lacking for four of the key foliar diseases requiring innovation to initiate control measures that have been largely lacking. Even for Frogeye Leaf Spot, the researchers seek novel and new sources of genetic resistance.

Section B: EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goals in Sustainable Production to develop BMPs and also resistant varieties for farmers to control the 5 foliar diseases.
- Addresses goal of Sustainability Supply Road Map as this is an eight state project that receives support from each state’s QSSB, and has direct tie-in with a USB project funded jointly with a regional check-off organization, the MidSouth Soybean Board (MSSB).
- The outreach component seeks to fulfill Stage 3 of the Road Map, as it provides information and data for Osborn and Barr’s Take Action on Disease website, and their educational program to prevent fungicide resistance and promote overall better fungicide efficacy.

2: Value Impact

- Development of BMPs, management recommendations, new control measures, and sources of genetic resistance germplasm help reduce yield loss from one or combination of foliar diseases, as any one of these diseases can cause 10-20% average yield loss on infected acres.
- Cercospora Leaf Blight has become one of the worst diseases in the South and is spreading north and east with no real means of control. Hence, newly developed control measures for this disease by this project are valuable to stem the potential loss.
- Widespread use of foliar fungicides have increased yield in many parts of the U.S, yet can out-live their usefulness if resistance build-up in not managed, which BMPs have been largely developed through this project and communicated to media (including Osborn and Barr) and also validated by chemical companies.

3: Execution Feasibility

- Chemical (fungicide) companies are well aware of the market challenges of properly managing fungicide use, and look to information stemming from this project to protect its deployment of an effective product that required years and millions of dollars to develop.
- Adoption of genetic resistance for Frogeye Leaf Spot and Cercospora Leaf Blight has partially been restrained by lack of viable resistant material and screening tools to adequately assess progress – all of which is being developed by the project, though it takes time upon starting from scratch.
- The proposed project is fortunate to have access to multiple resources to tackle this task, including directly leveraging with a $778,000 federal grant, over $100,000 per year in matching QSSB funding, plus tie-in with a joint USB-MSSB project ($262,233 total).
- Some of the project research requires cutting edge technology and fortunately the labs involved have the equipment and expertise to handle the demand.

Section C: SPECIAL CONSIDERATIONS (optional)

- In summary, the proposed project is comprehensive in scope and deliverables as well as a team representing eight states and many acres takes advantage of its resources through multiple partnerships.
- The outreach component will be amplified in the coming year, especially given the interest by industry in the outcomes.
Section A: PROPOSAL SUMMARY

- The main deliverables are updated management recommendations plus tools and resources to help farmers control a number of common seedling diseases that rob yield (over 40M bushels loss annually or average 5-10% yield loss per farm) and cause early stand loss, which can lead to costly replanting in terms of time and inputs.
- Over the years, genetic resistance has only been available to control Phytophthora root rot; developments from this project will aid breeders to develop genetic resistance to Pythium seed rot, several Fusarium root rot pathogens, and Rhizoctonia root rot.
- Innovations on this proposal are being passed on to public and private company breeders and to farmers, Extension, and company tech reps via outreach activities and publications.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP goal in Sustainable Production aimed at developing BMPs for farmers to control seedling diseases that cause stand loss and yield, and also provide tools to breeders to develop genetically resistant varieties to these diseases.
- Addresses Sustainability Supply Road Map to cross collaborate with regional check-off organizations as this project is jointly funded and managed with North Central Soybean Research Program (NCSRP) along with multiple QSSBs.
- Complies with Road Map goal to develop sustainable practices, namely less dependence on seed treatments, as pathogenic organisms can develop fungicide resistance to continual use of seed treatments.
- Outreach activities cooperate with Osborn and Barr in their Take Action Disease program/web-site to promote sustainable use of seed treatments.

2: Value Impact

- Development of BMPs and management recommendations to control seedling diseases help reduce yield loss (over 40M bushels loss annually or average 5-10% per farm) and ameliorate early stand loss, which can lead to costly replanting in terms of time and inputs.
- Knowledge gained from this project on understanding the biology of seedling pathogens and the underlying environmental factors favoring infection lead to management strategies to control these diseases and ultimately to the more precise and effective application of seed treatments.
- Given the increasing acres growing cover crops, the project has added studies on interaction of cover crops and seedling diseases to devise management strategies to avoid possible added effects on early stand vigor by cover crops and seedling disease.

3: Execution Feasibility

- The researchers have proven fully capable of conducting tedious lab, greenhouse, field trials to evaluate the various seedling diseases – something that industry is not willing to do.
- Identification of the individual pathogens described under the umbrella term of “seedling diseases” has helped to support the exploding market for seed treatments.
- However, chemical companies will require guidance to more effectively apply active ingredients according to geographic prevalence of the individual pathogens, and avoid overuse that ultimately can result in fungicide resistance.
- Seed company partners will benefit by utilizing tools developed by this project to expand the scope of genetic resistance to seedling diseases beyond their current limited effort to address just Phytophthora root rot.
- The project is jointly funded ($269,501) and managed with North Central Soybean Research Program (NCSRP) along with support of multiple QSSBs.

Section C: SPECIAL CONSIDERATIONS (optional)

- This project proposal complements the USB project by Anne Dorrance at Ohio State that actively makes available to the seed industry resistant germplasm and molecular markers to all (Rps) races of Phytophthora as well as for newly identified species of Pythium, and also for Fusarium graminearum.
Section A: PROPOSAL SUMMARY

To support sustainable soybean production, the proposed project aims to identify flood tolerant genetic resources and mechanisms for early and mid-season flood stress, to develop flood-tolerant and high-yielding germplasm, and to optimize management practices to protect yield from excess water. The proposed effort is moderately innovative, primarily evaluating genetic materials that have been screened as flood tolerant and developing markers for the genes involved in tolerance. The directors requested moderate to innovative proposals in this area with a request to leverage efforts supported by regional programs and QSSBs. This proposal is the only one received that is developing tolerance to flooding. Development of flood tolerant soybean varieties represents a means of improving sustainability of soybean production on an estimated 13 million acres that represent a potential annual loss of $1.5 billion to flooding.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This proposed research will develop new germplasms and markers for genes that provide tolerance to flooding. The identified genes and markers will be made available to commercial seed companies for inclusion in their breeding programs to develop new, flood-tolerant soybean varieties. Irrigation has been developed and employed as a means of ensuring soybean production during periodic drought events. Land that is either bedded or leveled to support effective irrigation, particularly in the Mississippi River Delta region is uniquely susceptible to periodic flooding following periods of intense precipitation, or high rainfall immediately following an irrigation application. Soybean is susceptible to submergence of over 24 hours, particularly during periods of high temperature. Incorporation of genes that allow soybean plants to recover following submergence could provide a significant economic benefit to soybean farmers dealing with periodic flooding.

2: Value Impact

Currently approximately 16% of U.S. agricultural fields are subject to periodic flooding, including over 8 million acres of clay soils in the Mississippi River Delta region of Missouri, Tennessee, Arkansas, Mississippi and Louisiana, and also in areas along the eastern seaboard with high water tables and subject to periodic flooding from hurricanes. U.S. average losses due to periodic flooding are estimated $1.5 billion/year and NASA simulation models have recently predicted a 30% increase in heavy precipitation events by 2030. Cost of replant alone on an estimated 13 million acres annually (16% of 84 million acres) would be over $1.3 billion that could potentially be saved if stand loss could be prevented through the use of flood tolerant varieties.

3: Execution Feasibility

The researchers involved in this project have been very successful at implementation and completion of soybean breeding research efforts in the past. This program has already identified some key genes involved in flooding tolerance and advanced flood tolerant breeding populations have been developed. Mapping populations have been developed that will allow for the identification of markers for key genes. The key to ultimate success will be developing interest among commercial companies to develop flood tolerant soybean varieties using the genetic materials developed in this program. Engagement with key commercial companies to expose them to the new materials and their value will be a key to moving to the next stage. This proposal has support from the following QSSBs:

- Missouri Soybean Merchandising Council $80,000
- Arkansas Soybean Promotion Board $25,000
- North Carolina Soybean Producers Association $25,000
- Louisiana Soybean and Small Grain Research and Promotion Board $22,000
- Mississippi Soybean Promotion Board $11,000

Section C: SPECIAL CONSIDERATIONS (optional)

- This is year two of a proposed three-year program. Significant progress has been made in identifying traits and genes associated with flood tolerance.
This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.

Section A: PROPOSAL SUMMARY

- This POP reflects a combination of two new interdependent activities: Activity A - Economic and environmental impact of multi-use cover crop species in Tennessee no-till soybean/corn rotation ($116,604) and Activity B - Long-Term Effects of Cover Crops and Crop Rotations on Soil Health and Water Availability ($36,008) that answer the Sustainability Supply Roadmap to support production practices that sustain and improve long-term soil health and protect water resources.
- Main deliverable is recommendations for cover crop management in terms of effects, advantages/disadvantages of different species and quantifying long-term impact on soil health, nutrient cycling, soil water availability, and soybean productivity.
- Value of cover crop research is in exploiting their benefits as a management practice preserving long-term sustainability of soil and soil water retention that can enhance profitability over the long term by potentially requiring fewer inputs for soil fertility, irrigation, etc.
- The activities are not attempting to introduce new innovations as much as to summarize and validate current cover crop management research.

Section B. EVALUATION CRITERIA

1: Strategic Importance

- Addresses LRSP in Sustainable Production in developing BMPs that improve soil health and conserve water resources.
- The activities seek to recommend how to optimize management of cover crops since cover crops have increasingly become a broadly recommended practice to improve and conserve soil properties and characteristics that are favorable to crop growth.
- Farmers, CCAs, consultants, etc. will become aware of results and recommendations that will be provided through Extension bulletins and feature articles in regional ag. media.

2: Value Impact

- Impact of value will come through an assessment made of best management practices for cover crop management to optimize expense and inputs involved to reap the rewards/advantages of cover crops to improve soil and water sustainability.
- ROI likely to come through a rough equivalent of the cost of the investment in establishing the cover crop and in return, reap improved soil productivity over the long term.

3: Execution Feasibility

- Though the research will be done in Tennessee, the recommendations have implications for a wide soybean market area. Cover crop work in Tennessee offers advantages of assessing a wide number of cover crop choices and species currently used there and presence of a long-term cover crop plots at Milan established some time ago.
- Both activities will be executed at University of Tennessee locations and overlap at Milan where cover crop work has been going on for some time.
- No leveraging of funds currently exists for the two activities.

Section C: SPECIAL CONSIDERATIONS (optional)

- Both activities are new project activities.
The positive sustainability story of U.S. soy sets it apart from its competitors both domestically and globally. To maintain this competitive advantage over competing feedstuffs, oils and countries, U.S. soybean farmers must continue to improve the way they produce soybeans. On-farm technology offers opportunities to innovate and improve, unlike ever before, and, in turn, see greater profit opportunities and improvements in sustainability on the farm and at the aggregate level, as measured by metrics in the SSAP and Field to Market. To seize the opportunity to increase sustainability improvements via technology, USB will digitally distribute an issue of its flagship publication, Beyond the Bean, to a targeted list of farmers who are best positioned to continue adopting technology and maximize it to its fullest potential. The issue will focus on the connections between technology use and meeting demands of U.S. soy customers, with additional emphasis on the profit opportunities possible through efficiencies gained. We’ll show how the checkoff is committed to sustainability in order to increase demand for U.S. soy and soy products—and profit potential for U.S. soybean farmers.

For more than a decade, Beyond the Bean has been the flagship publication and a key communications vehicle for the checkoff. USB’s latest Producer Attitudes survey continues to show a correlation between those farmers who support the checkoff and those who support the checkoff. More than two-thirds of those surveyed recall receiving the magazine—a recall rate comparable to that of industry-leading, weekly publications. This trusted resource will be one piece of a larger effort to communicate how sustainability, technology, and profitability are interwoven. The content of the magazine will be distributed digitally to a group of targeted farmers who are in the “moveable middle” related to technology: those who are neither the earliest adopters nor laggards and are interested in understanding more about the best ways to maximize on-farm technology and data. Targeting these farmers means checkoff messages resonate with the audience best prepared to receive them, plus provide the greatest opportunity to influence aggregate sustainability metrics important to marketing U.S. soy as sustainable.

USB staff have successfully implemented a farmer outreach plan on sustainability for several years. A sustainability campaign conducted last year raised the awareness among farmers of their contribution to a sustainable soy crop by more than 10 points from the year prior. Maximizing technology use is one way to improve overall sustainability and this magazine will be one piece of a larger effort to help farmers best use technology for their operation to improve profit opportunities and overall sustainability. USB communications staff have produced Beyond the Bean for more than a decade, with a well-documented process for developing content and the magazine’s layout. We’ll partner with venerable Farm Journal Media to digitally disseminate the magazine to a targeted list of farmers. By blending our decade of experience with the magazine and their tested digital platform to engage farmers, we eliminate the identifiable technical hurdles.
Section A: PROPOSAL SUMMARY

Farmers have witnessed an explosion in on-farm technology options in the last decade. These technologies provide numerous opportunities for farmers, including increased profitability and gains in efficiency, and a marketing advantage for U.S. soy by increasing the aggregate level of sustainability. But an increasing number and complexity of options leads to few clear-cut decisions for farmers in the technology space. As a neutral source of information and resources, USB can provide this clarity and accelerate the adoption of these technology tools. To achieve that end, USB will leverage industry partners to distribute checkoff-developed resources and information that help farmers maximize their use of technology and consider additional technology that may be right for their farm. Maximizing on-farm technology use offers profit opportunities for farmers and, in many cases, improves overall farm sustainability. Improvements in sustainability at the farm level may seem small but when combined with soybean farmers from all over the country, the industry will see positive changes in the aggregate level of sustainability related to the industry-recognized goals of the SSAP and Field to Market.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Farmer adoption of technology supports U.S. soy’s sustainability over the long-term. Many farmers are not aware of the connection between technology and sustainability and why it is important to maintaining end-user demand. USB will leverage the work of other recognized industry partners, like media outlets or ag organizations that farmers know and trust, to disseminate checkoff-produced information that makes this connection and encourages farmers to capitalize on the technology offerings that are available and best suit their farm for profitability and sustainability benefits. USB can be a leader in this space for the industry, connecting technology to profitability and sustainability. Farmers will see benefits through both direct profit opportunities through efficiencies gained on the farm and indirect profit opportunities through maintained and increased global demand for U.S. soy.

2: Value Impact

Although it is difficult to quantify the dollar value of sustainability in the U.S. soy product, USB and many U.S. soybean farmers know that it is something all U.S. soy customers, both domestic and international, demand. U.S. soybean farmers cannot ignore this trend without a long-term effect on their market share. USB can be a leading voice to help farmers better understand this connection, why technology is such a critical piece of the solution and the value of it to preserve long-term U.S. soy demand. The value proposition of this proposal is the strength of partnerships USB can develop and leverage to promote the connection between technology and sustainability, as well as tools to help farmers maximize on-farm technology for their benefit. Gradual continued improvement efforts, including maximizing technology offerings, keep U.S. soy ahead of the global sustainability curve and maintain demand for U.S. soy. In addition to maintaining and increasing demand, numerous on-farm innovations have proven successful in developing production efficiencies and cost reductions.

3: Execution Feasibility

Leveraging relationships with many organizations have been crucial to the success of USB for the last 25 years. Partnerships established through this proposal will help USB maximize the reach of its messaging and make progress in building farmer awareness of the connection between technology and continuous sustainability improvements. This will lead to increased farmer profitability and greater long-term demand.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

On-farm technology and data-management services offer opportunities for farmers to become more efficient and enable sustainability unlike ever before. As end users demand sustainably-sourced products, on-farm technology and data holds tremendous potential for continued sustainability marketing efforts for U.S. soy. Understanding the value of technology, how to maximize it for greatest return and what to do with the vast quantity of data now available can be overwhelming for most farmers. Farmers need greater support to understand how to best use technology for their operation. To provide that support, USB will create a communications platform to encourage farmers to adopt these technology tools with 1) ways to maximize use of existing technology and 2) guidance to use data to inform future decisions. The program will be modeled off of USB’s successful Take Action program, working with industry experts from the public and private sector, farmers and others to create resources and build awareness and support of the platform’s goal of helping farmers best use on-farm technology. Successful implementation of the program will result in a broader use of technology and data long-term. This will offer direct profit opportunities for farmers, and increased sustainability of U.S. soy at the aggregate level, as measured by industry-recognized metrics in the SSAP and Field to Market.

Section B. EVALUATION CRITERIA

1: Strategic Importance

U.S. soy’s sustainability is a marketing advantage over global competitors. More and more end users demand that the products they source are sustainable. Right now U.S. farmers can deliver this product, but the status quo will not be enough long-term. Farmers must continue to innovate and adopt practices that increase sustainability over time. On-farm technology is one way to do that. Additionally, the data capture that occurs on many farms today holds valuable information for proving sustainability and continuous improvement. Many farmers are not aware of the link between technology and sustainability and why it is important. USB will help farmers understand this and help them maximize their use of technology by connecting them with fellow farmers and experts alike and resources they can use. The long-term goal of this effort is to raise the aggregate level of U.S. soy sustainability, specifically as measured against the industry-recognized metrics of the SSAP and Field to Market. USB can be a leader in this space for the industry, connecting technology to profitability and sustainability. Farmers will see benefits through both direct profit opportunities through efficiencies gained on the farm and indirect profit opportunities through maintained and increased global demand for U.S. soy.

2: Value Impact

Although it is difficult to quantify the dollar value of sustainability in the U.S. soy product, USB knows that it is something U.S. soy customers expect. By facilitating the adoption of technology tools that enable sustainability, USB will help the U.S. soybean industry deliver on this expectation. The value of this proposal to the industry, though indirect, has the potential to be great. Gradual continued improvement efforts, including maximizing technology offerings, keep U.S. soy ahead of the global sustainability curve and maintain demand for a sustainably-raised product. For farmers the benefits are more direct, through efficiencies gained and potential cost savings. A platform for ag technology similar to the Take Action program does not currently exist in the ag space. As farmers look for resources to help them best use what they already have, as well as consider future technology adoption, this platform can serve as an un-biased go-to resource for soybean farmers across the country.

3: Execution Feasibility

Numerous on-farm innovations have proven successful in developing production efficiencies and cost reductions. With additional unbiased information and resources provided by USB, farmers can continue to realize these benefits and the U.S. soy industry can continue to see gradual gains in sustainability. USB has partnered with industry and university experts before to develop information programming and resources for U.S. soybean farmers, particularly in the areas of pesticide resistance management and sustainability, and can apply lessons learned in this new focus area.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

Regulatory approval processes to get new traits from the lab to the field are complex and full of delays, and Washington, D.C., regulators and influencers do not understand the benefits of new soybean traits. To help educate them, this proposal will target decision makers and regulatory staff who have influence over biotechnology regulatory policy with educational messages. These messages will include compelling content delivered to decision makers through targeted paid media to drive understanding of the benefits of biotechnology. This proposal will also conduct an economic and environmental assessment of CRISPR gene editing technology. If they understand the benefits, regulators and influencers can expedite approval of both proven and new technologies so farmers can plant new traits quicker to further contribute to U.S. soy’s sustainability.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Biotechnology is an important tool for improving U.S. soy’s sustainability. This proposal is designed to make sure that Washington, D.C., regulators understand how biotechnology impacts soy’s sustainability. This proposal will build solid understanding of the science and safety of biotechnology and also emphasize the benefits. To ensure continuous sustainability improvement at the farm gate, farmers will need access to new tools and technology, including CRISPR. Education about the needs and benefits of these biotech tools is necessary, or U.S. soybean farmers won’t see a change in how biotech traits are viewed and evaluated.

2: Value Impact

Biotech traits enable farmers to produce more with less to overcome pressures such as insects, weeds and disease, and to improve the quality of their product. Biotech traits also provide increased opportunities for farmers to profit. However, decision makers and regulatory staff who have influence over policy and the regulatory processes suffer from delays due to a lack of understanding and awareness around the benefits of biotechnology. Farmers and the value chain pay for this lack of understanding. A white paper from the Economics and Management of Agrobiotechnology Center revealed that regulatory delays would cost farmers and consumers a total of nearly $19 billion over the next 10 years. A more expedient regulatory process will help farmers gain access to the tools they need sooner, resulting in millions of dollars of recouped lost efficiencies and the ability to contribute to U.S. soy’s sustainability. As new technology solutions enter the marketplace, including CRISPR, USB can continue to build the case and communicate the benefits of biotech to ensure new innovations get to farmers’ fields.

3: Execution Feasibility

Building understanding and acceptance of biotechnology among decision makers and regulatory staff who have influence over regulatory policy is an ongoing process. By creating educational communications and delivering them to Washington, D.C., decision makers and regulatory staff via a trusted and targeted platform—the Washington Post—USB can inform and educate the target audience on proven technologies now. By investing in an analysis of CRISPR, USB will be positioned to evolve with the changing biotech landscape and continue to serve as an educational resource for the target audience. Sharing this content and research with the American Soybean Association and life science companies will help to broaden the reach of these efforts.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
PROPOSAL ON A PAGE

**POP Name:** Technology and Innovation Coalition and Outreach

**Short Name:** TECHCOAL

**Proposal #:** 1830-272-0429

**Requested Budget:** $235,559

**Last Gate Score, if applicable:**

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**Section A: PROPOSAL SUMMARY**

This POP will support the Marketplace-Sustainability-Value Road map which reads “Continue to address market access issues as needed and refine sustainability messaging and promotion as needed” and the milestone “Regulators will understand the need for innovation to quickly approve new traits that benefit the value chain.” This POP will educate and inform influencers and regulators about the advantages of innovation and technology to gain more rapid approval for new traits that benefit the value chain. It will ensure that U.S. soybean producers continue to reap the benefits of biotechnology which were estimated to be $10.6 billion from 1993 to 2006 (University of Missouri). Additional, collaborative funding of $1,868,846 for this work is anticipated.

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**Section B. EVALUATION CRITERIA**

**1: Strategic Importance**

This POP will educate and inform influencers and regulators about the advantages of innovation and technology to gain more rapid approval for new traits that benefit the value chain. It will help influencers and regulators gain a better understanding of key advances in technology and innovation by leveraging USB’s LRSP.

- The proposal will strengthen USB’s relationships with regulators, legislators and influencers by helping them better understand the benefits of innovation and technology, especially biotechnology, in today’s soybean farming.
- By engaging regulators and influencers, this proposal advances relevant, strategic partnerships that will benefit soybean farmers in the U.S., with their largest market using 33.1 million tons of SBM per year (USDA), the equivalent of 1.4 billion bushels.
- This proposal will encourage understanding by building on quality relationships with regulators and influencers who don’t directly purchase soybeans or any soy products.

**2: Value Impact**

This proposal provides research to identify potential misconceptions the core audiences may hold and effectively address them. It reaches out to them and, through coordination with QSSBs and allied organizations, amplifies the soybean checkoff’s efforts.

- This proposal improves grower profitability by ensuring the ability to obtain the benefits of innovation and technology, especially biotechnology.
- Investment into the proposal continues to leverage the trend to generate significant value for soybean farmers (estimated value of biotechnology to U.S. soybean farmers was $10.6 billion from 1993-2006 - University of Missouri).
- This proposal will drive adoption of U.S. soy offerings by balancing against negative perceptions and intensity of discussions about farmers’ sustainability and the benefits of biotechnology.
- The final solution will result in an improved perception of U.S. soy products, improving their competitive position globally, in turn boosting farmer profit.

**3: Execution Feasibility**

Continued strong efforts are needed to educate regulators, legislators and influencers about sustainability advances in soybean farming and the benefits of biotechnology. Over the past few years, the contractor’s quality relationships have resulted in invitations to present to and in some cases collaborate with Senate agricultural staff, National Association of State Departments of Agriculture, Biotech Industry Association, American Farm Bureau Federation, National Chicken Council and National Turkey Federation among others. These are critically important allies, some whose members purchase a lot of SBM and whose actions are very influential.

- Contractor has successfully executed in the past and there is no reason to expect otherwise this year.
- Collaborative funding of $1,868,846 from a variety of companies and organizations in the food sector is anticipated.

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**Section C: SPECIAL CONSIDERATIONS (optional)**

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This document is to aid evaluation and scoring of USB proposals. Questions are provided in each section to guide the author. Not every question needs to be answered. Brevity over quantity of information is emphasized, with an aim to fit on 1 page.
Regulators and influencers are charged with ensuring a safe and sustainable food supply. GMO trait approvals are often slow and other trade disruptions can occur over food safety issues. The U.S. soy industry must address these regulatory issues to ensure that Regulators and influencers maintain market access for U.S. soy and understand the need for innovation to quickly approve new traits that benefit the value chain. This proposal includes travel expenses for staff, contractors and grower leaders who work on addressing market access issues in addition to funding roundtables, meetings, trade show participation and educational opportunities to engage global regulators on the importance, safety, and sustainability of biotech. Importantly, this proposal includes funding for a network of local contractors in the U.S., Europe and Asia, and industry partners who are well informed (particularly regarding late-breaking and current events) on the facts about agricultural biotechnology and its impact as well as other market access challenges such as Maximum Residue Limits (MRLs). USB director guidance for this program suggested that they wanted to see engagement with key partners in selected markets to amplify messaging as well as to look into collaborating with other partners. Furthermore, they recommended that sustainability be used to address market access issues. This proposal delivers on those director requests. This proposal is not interdependent with any other proposals.

Section B. EVALUATION CRITERIA

1: Strategic Importance

U.S. soy constantly faces market access challenges including slow approvals of biotech traits and an increasing pressure on pesticide residues creating potential trade disruptions. This proposal therefore focuses directly on the Value-Sustainability Goal Objective D (Regulators will understand the need for innovation to quickly approve new traits that benefit the value chain) and Objective E (Regulators will maintain market access for U.S. soy and avoid major trade disruptions). In addition, continued work to have U.S. soy accepted within the EU Renewable Energy Directive will be undertaken. Strong relationships with regulators and influencers are critical to the success of this approach and is therefore a priority. Some examples of these key partnerships include: International Grain Trade Coalition, U.S. Biotech Crops Alliance, the Consumer Goods Forum, various feed associations throughout Europe including the influential European Feed Manufacturers’ Federation (FEFAC), the State Administration of Grain and various government entities in China, among others globally.

2: Value Impact

This proposal strategy ensures market access for U.S. soy by demonstrating the sustainability of the U.S. soy production, working in international markets to gain approvals of new traits and products, and promoting a science-based, transparent and predictable regulatory environment. Without constant monitoring and relationship building with regulatory bodies, U.S. exports could be severely impacted. We know from research, that a three-year delay in commercialization of a trait due to approval delays, results in a cost of $19 billion dollars (over the succeeding 10-year period) to consumer and producers (Kalaitzandonakes, 2015). Market disruptions can and do happen, causing millions, even billions of dollars in losses. However, it does provide the resources needed to quickly mitigate issues and help prevent new ones from occurring. Not having such a strong network in place could jeopardize trade. Success for this proposal is defined as increased acceptance of SSAP, approvals granted, and avoiding major trade disruptions due to SPS and other TBT issues.

3: Execution Feasibility

It is anticipated that USB’s investment in this proposal will leverage an additional $380,810 from USDA/FAS. USB could face daily challenges in the execution of this work considering the purpose of this proposal is to identify and mitigate roadblocks. However, the experts that would be contracted through this proposal are well informed (particularly concerning late-breaking and current events) on the facts about agricultural biotechnology and its impact as well as other market access challenges such as Maximum Residue Limits (MRLs). Such support provides by far the most effective voices when controversies are manufactured or flare up, but without focused external support they rarely have the information or confidence to weigh in. These contractors will follow the status and trends of agricultural biotechnology acceptance, adoption and potential across key regions and countries. Local authorities will be identified that can assist with technical issues as they arise. Locally, work programs will be coordinated with local in-country agricultural commercial industries such as livestock, feed, soy crushing and processing, food industry, retail grocery and regulatory officials.
This proposal would support intelligence gathering on the regulatory framework for approval of biotech imports in several emerging markets as well as advise on alternatives that are most desirable to U.S. soy to ensure there are timely approvals and avoid trade disruptions. Industry outreach and coalition building is also included. This proposal addresses USB Director requests for proposals that evaluate regulatory systems and needs. This proposal is not dependent upon any other proposal.

Section B. EVALUATION CRITERIA

1: Strategic Importance

There are several emerging markets with potential to increase imports of U.S. soy. However, they do not currently have a regulatory framework to approve biotech imports. In some cases, like Bangladesh and Thailand, they are already importing U.S. soy. In other cases like India, they are not importing but could be in the coming years. For Thailand, they have long operated without much of an approval system, however, there has been recent renewed interest in establishing a process. USB has been invited to provide information regarding process, but there is still much work to be done to ensure there is a science-based, predictable, transparent and timely process established. This will help ensure open access for these emerging markets. This proposal focuses on the Value-Sustainability Goal Objective D (Regulators will understand the need for innovation to quickly approve new traits that benefit the value chain) and Objective E (Regulators will maintain market access for U.S. soy and avoid major trade disruptions).

2: Value Impact

As emerging markets consider their biotech policy, U.S. soy has an opportunity to ensure favorable regulatory frameworks are established. In the case of Bangladesh, they are growing rapidly and will need to establish a functioning regulatory framework at some point. U.S. exports of soy products to Bangladesh, virtually non-existent five years ago, grew more than 50 percent last year to reach 977,770 metric tons (35,923,269 bu.) in 2015/16 (Source: USDA). In the case of India, they have no biotech approval process in place but the Indian industry certainly recognizes there will be a need at some point in the future and want to ensure it is well functioning. Thailand is the world’s fourteenth largest feed producer and ranks among the top ten global broiler producers. The U.S. holds a 15 percent market share in imported soybeans and 25 percent share of the soybean meal market (Source: USSEC Market Snapshots). Biotechnology acceptance is not a major issue yet, but the government will on occasion raise GM concerns with regards to food safety. Remaining at the forefront of the regulatory discussions in these countries could help mitigate future trade disruptions.

3: Execution Feasibility

This proposal is not expected to leverage any additional third-party funding. There could be daily challenges in the execution of this work considering the purpose of this proposal is to identify and affect favorable agriculture policy for U.S. soy. However, the experts that would be contracted through this proposal are well informed (particularly concerning late-breaking and current events) on the facts about agricultural biotechnology and can help guide U.S. soy’s response to proposed regulatory frameworks as appropriate.
PROPOSAL ON A PAGE

POPN Name: Advancing the U.S. Soy Advantage Through the Value Chain
Short Name: MA-MO-C60
Proposal #: 1810-273-0439
Requested Budget: $1,198,505

Section A: PROPOSAL SUMMARY

The intent of this proposal is to raise target audience awareness of the latest technology releases of new and improved soy products and encourage them to make purchase decisions based on the U.S. soy advantage (USB LRSP Sustainability-Value goal Buyers Objective C). Buyers in targeted markets are requesting certified sustainable U.S. soy and seek U.S. soybean oil and soy protein as a sustainable ingredient. Through USB’s communications initiatives, these targets will also gain an understanding of the intrinsic and extrinsic values of U.S. soy, building a preference for U.S. soy and soy products. USB will accomplish this through ongoing digital content marketing outreach to key customers, development of print and electronic materials, media outreach, and messaging development that will support the market development efforts in each target market. USB directors sought proposals that drive the message of technology adoption and sustainability linkage and use sustainability to address market access issues. This proposal is designed to satisfy this request. This proposal does not depend on any other proposal. However, it is meant to create tools that can be used by USB’s field teams in their market development work. Funding for these efforts are spread out in various additional proposals under consideration.

Section B: EVALUATION CRITERIA

1: Strategic Importance

The global customer survey conducted spring 2017 suggests that there is opportunity to expand target audience awareness of the U.S. soy advantage in meal and oil applications which could help drive purchasing preferences. For meal, only 57 percent of surveyed customers agreed that meal made with U.S. soybeans is better in feed formulations and 59 percent said that they prefer feed made with meal from U.S. soybeans because the feed nutrient components produce better results. For oil, only 52 percent of surveyed food manufacturers were aware of the specific advantages of USSBO and 56 percent felt USSBO had specific advantages compared to other edible oils. These results suggest that more than 40 percent of USB’s international target audience has yet to be convinced of the U.S. soy advantage. However, 79 percent of those surveyed on average agreed that the sustainability of U.S. soy is important to the success of their business. This suggests that USB can leverage existing opinions about sustainability to build preferences for U.S. soybean meal and oil. This proposal will provide communication initiatives that will help regional teams deliver consistent messages on the U.S. soy advantage.

2: Value Impact

The opportunity for value creation comes from highlighting the sustainability advantage of U.S. soy among those buyers where this matters and to educate respective audiences for meal and oil about the intrinsic advantages of U.S. soy in their specific applications. This is a critical step to differentiate U.S. soy from other origin soy to drive purchasing preferences and what this proposal seeks to accomplish. By 2021, the LRSP milestone for this objective is to reach a yet to be determine percentage of targeted buyers that are purchasing U.S. soy because of its digestible protein, amino acid profile, energy, and sustainable production. The activities funded by this proposal are designed to advance buyer knowledge of advantages and increase preference for U.S. soy beyond current baselines. This proposal will assist the Action Team in determining an appropriate 2021 milestone and ultimately the definition of success.

3: Execution Feasibility

There is the potential for leveraged third party funds from USDA/FAS totaling $274,276. USB does not anticipate any technical or marketing challenges in the execution of this proposal with one exception. The digital communication system requires customers to opt in to receive electronic communications directly. Currently, there are nearly 8,000 potential customer contacts in the database, but only 11 percent have opted in to receive digital communication. Outreach to the balance of the contacts through other means (non-electronic) might be needed to allow for proper leveraging of the communication initiatives developed through this proposal. This work can be accomplished through ongoing customer outreach by USB’s field teams.

Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

Regulators and influencers must make decisions about what to prioritize due to the lack of federal funding, and they don’t fully understand the rationale or the benefits from prioritizing much needed improvements to the U.S. inland waterways system. To help educate this audience, USB can leverage the American Soybean Association (ASA) and influential inland waterways groups to carry USB’s coordinated message about the importance of the inland waterways system to decision makers and regulatory staff who have jurisdiction over infrastructure spending policy. If regulators and influencers invest in the inland waterways, the most economical and efficient mode of transportation for U.S. soy, U.S. soy will maintain its competitive advantage of reliable, efficient and timely delivery to end users.

Section B: EVALUATION CRITERIA

1: Strategic Importance

Infrastructure investment is a key focus for the checkoff because transportation connects U.S. soy supply with U.S. soy demand. The infrastructure system is a pillar of the U.S. Soy Advantage because it enables a consistent and reliable delivery of U.S. soy, and it needs to stay that way. USB’s infrastructure focus is on the locks and dams, as waterways are the most economical and sustainable mode of transportation for U.S. soy and the infrastructure is crumbling. Infrastructure is currently a priority for government funding, and the checkoff has an opportunity to elevate the importance for investment in U.S. soy’s most efficient transportation mode, the inland waterways, through an educational and coordinated communications effort.

2: Value Impact

If USB does not work to improve the U.S. infrastructure, U.S. soybean farmers will be among those who pay the price. A lengthy failure at a key lock and dam along the inland waterways system would result in tens of millions of dollars in lost revenue for U.S. farmers, according to the Soy Transportation Coalition (STC). To maintain the consistent supply and reliable delivery of U.S. soy to buyers and end users around the world, U.S. soybean farmers need access to modernized and improved infrastructure. Communicating to decision makers and regulatory staff who have influence over infrastructure spending policy about the need for investment in the waterways now, especially during a new administration that would like to focus on infrastructure, will help to make USB’s vision of infrastructure improvements a reality.

3: Execution Feasibility

The execution of this proposal depends on working with several groups, including ASA; STC; QSSBs; the Transportation Research Board; the Inland Rivers, Ports & Terminals Association; the U.S. Army Corps of Engineers and other users of the transportation system. These groups were engaged prior to this proposal and will be active partners in carrying messages to key decision makers and regulatory staff who have influence over infrastructure spending policy to make a change in our infrastructure. Additional partnership opportunities will be explored with the Association of Equipment Manufacturers, Waterways Council, Inc., National Waterways Conference and The American Waterways Operators.

Section C: SPECIAL CONSIDERATIONS (optional)

N/A
Section A: PROPOSAL SUMMARY

U.S. Farmers & Ranchers Alliance (USFRA) is a voice for farmers and ranchers, of all sizes, commodities and types of production. Through its strategy and activities, USFRA brings this farmer and rancher voice to key audiences -- including influencers, regulators, end users (i.e. retailers, processors, food companies) and media -- to allow them to hear directly from the people who are growing and raising their food. USFRA research has found that when our target audiences hear from the farmers and ranchers themselves, they have a better understanding of why certain production techniques are used, why farmers and ranchers make certain decisions on their farms, and ultimately trust farmers and ranchers to provide sustainable and healthy food choices. Food companies and end users are continuously announcing new product claims and procurement decisions (e.g., elimination of GMOs, sustainability pledges, etc.), almost becoming de facto food regulators with far reaching impact at the farm level. Many times, their sourcing and purchasing decisions are made without direct input or consult from farmers/ranchers or their respective organizations, and with little regard for the implications to the overall effect on farmers and agriculture as a whole. As more end users shift sourcing decisions, citing sustainability goals at the heart of their efforts, the end result could be incremental adjustments to existing farming practices or fundamental changes in farming structures. Through this proposal, USFRA is encouraging soybean farmers to become advocates of their farming and sustainability practices by giving them the necessary tools and training for activation. In addition, through thought leaders, experts and a series of promotions, the proposal is designed to demonstrate to food companies, the soybean industry’s pledge to continuous improvement and enhanced sustainability practices moving forward, as well as deepen the end users understanding of the sustainable soybean.

Section B. EVALUATION CRITERIA

1: Strategic Importance

Communicating to end users about soy’s sustainability is important to USB’s LRSP. An objective within the board’s Sustainability goal calls for domestic and international companies to accept the sustainability of U.S. soy and to seek U.S. soybean oil and soy protein as a sustainable ingredient. This proposal provides a farmer voice to reach end users about soy’s sustainability by training and activating farmers to discuss sustainability online and in meetings with sustainability officers at various companies and organizations.

2: Value Impact

With successful farmer activation online and in-person to communicate with end users about soy’s sustainability, USB will continue to make incremental progress in telling soy’s sustainability story. As more and more end users understand how soybean farmers are practicing sustainable production methods, USB’s opportunity to become the preferred raw material choice to meet sustainability goals increases, helping to achieve USB’s strategy.

3: Execution Feasibility

Building end user knowledge about soy’s sustainability is possible, but it’s a vast audience to reach. Online communication enables a wider reach and in person meeting allows for greater impact in delivering information about soy’s sustainability.

Section C: SPECIAL CONSIDERATIONS (optional)

Please note that additional USFRA end user activities are included in proposal 1850-371-0867, Setting the Stage for End User Sustainability Partnerships – National Relationship Building. The activities in that proposal include implementing Food Dialogues and related activity at the National Restaurant Association tradeshow, the Institute of Food Technologists tradeshow and the SNAXPO tradeshow, along with the development of a soybean virtual reality video and support for a survey on perceptions of sustainability to use with the end-user audience.
End user sustainability programs are changing the way crops are grown. If U.S. soy wants to remain the preferred, sustainable raw material choice for buyers, U.S. soybean farmers must be willing to 1) improve the sustainability performance of their crop; and 2) share the results of these farming practices with those that are influencing these sustainability programs. This proposal brings end user needs into focus and demonstrates the outcomes of sustainable soybean farming – energy efficiency, nutrient reduction, water quality, soil health and a reliable, high-quality supply of soy. By connecting them to soybean farmers who are well positioned to talk about sustainability, this proposal helps USB continue to influence the decision making process and helps to paint a real-world picture of sustainable soybean farming. This proposal will train and position U.S. soybean farmers as thought-leaders and also continue to engage end users regarding soy’s sustainability. This proposal is interdependent on Driving Core Demand for HOSO and Extolling U.S. SBO Advantages Overseas, which are found in the Oil Target Area but target end users of soybean oil. This adds sustainability to the conversation and paints the big picture of using U.S. soy.
PROPOSAL ON A PAGE

POP Name: Biodiesel Sustainability
Short Name: BiodSust
Proposal #: 1830-372-0801
Requested Budget: $400,000
Last Gate Score, if applicable:

Section A: PROPOSAL SUMMARY

This proposal will address the Market Access Roadmap, stage 3 & 4 while helping to meet the FY18 milestone to increase the utilization of soybean oil for Biodiesel and Bioheat by 135 & 210 million pounds, respectively. In general, lack of knowledge about biodiesel’s positive environmental attributes reduces the market access for biodiesel. The Carbon Reduction Score for soy biodiesel assigned by USEPA and California Air Resources Board suffers from inappropriate penalties for indirect land use change and poorly reflects carbon benefits of using soy biodiesel. This proposal is designed to 1) determine scientific facts and arguments through strategic research on sustainability issues and 2) push that information to key and influential audiences, including thought leaders, environmental tone setters, early adapters, journalists, and key decision makers. A corrected Indirect Land Use Change (IDLUC) score could add $.25 per gallon to biodiesel sold in CA (on top of the $.66/gal secured through previous efforts of supplying IDLUC data that has been compiled through past USB funded sustainability proposals). Other funding sources $930,766: The United States Department of Agriculture, Nebraska, Iowa, Kansas, North Dakota, Illinois, South Dakota and Ohio QSSB’s will be asked to support the proposal in 2018.

Section B. EVALUATION CRITERIA

1: Strategic Importance

This proposal will increase utilization of soybean oil for biodiesel. It will also improve how biodiesel, soybeans, and agriculture in general are perceived among consumers. The market is asking for this solution. A corrected Indirect Land Use Change (IDLUC) score could add $.25 per gallon to biodiesel sold in CA (on top of the $.66/gal secured through previous efforts of supplying IDLUC data that has been compiled through past USB funded sustainability proposals). This could equate to $25 million a year under current circumstances. Improving the perception of ILUC and soy sustainability is necessary to increase volumes that could generate $200 million/year in value for biodiesel long-term by decreasing the penalty for indirect land use change (ILUC) further. This adds to and solidifies the current benefit that biodiesel adds $.63/bushel to soybeans marketed nationwide. This also improves the trend of biodiesel making soy protein more competitive by lowering the cost of protein by $20-$40/ton (Informa Economics).

2: Value Impact

Multiple jurisdictions want to increase the use of domestic, low-carbon fuel. Quantifying and communicating the environmental benefits of biodiesel will open larger markets for soybean oil. California consumes 6 billion gallons of diesel per year due to the Low Carbon Fuel Standard, and has grown to become the largest state market for biodiesel. In six years, the demand for biodiesel has grown from 20 million gallons in 2011 to 390 million gallons in 2016 with great potential for growth.

3: Execution Feasibility

Soy oil’s dominance in the biodiesel market is constantly challenged by rumor, misinformation and incorrect categorization as conventional fuel. This proposal works to establish soy biodiesel as the competitive and valued alternative fuel it is. NBB has built an exceptional team capable of meeting the technical challenges of this proposal. Likewise, NBB’s past success demonstrate proficiency at communicating results and getting stakeholder buy-in while minimizing opponent opposition.

Other funding sources $930,766: The United States Department of Agriculture, Nebraska, Iowa, Kansas, North Dakota, Illinois, South Dakota and Ohio QSSB’s will be asked to support the proposal in 2018.

Section C: SPECIAL CONSIDERATIONS (optional)
This proposal helps achieve the LRSP milestone of increasing buyer awareness of metrics that demonstrate U.S. soy sustainability, as a catalyst toward increasing U.S. soy demand by 45 million bushels in food/meat products that are marketed with sustainability traits. It supports the market access roadmap, with specific focus on stage 2 (discovery) of the market outreach track. As per Work Group request, the innovativeness is moderate, working with several new partners to take USB’s sustainability efforts to the next level, as described in the proposal. The program receives leveraged funding of $44,500 from private industry. The proposed solution will improve buyer perception of U.S. soy sustainability by piloting a suite of resources that strongly links U.S. soy sustainability to the sustainability of buyers’ own branded products. Executed successfully, the proposal will support increased demand of 45M bushels in domestic food/meat products by influencing buyers to target more of their own soy-containing products for growth through sustainability marketing.

1: Strategic Importance
This proposal advances a high priority LRSP objective with buyers in the Sustainability goal. It is a Stage 2 (Discovery) market outreach proposal in the market access roadmap, so it will evolve USB’s sustainability work beyond business-as-usual to address what’s coming next. The proposal directly engages with buyers, collaborating with them in a forward-looking initiative, and will significantly strengthen USB’s relationship with the buyer audience. In addition, the proposal highlights opportunities for co-funding future efforts with buyers. Such a model will enhance strategic partnerships between USB and buyers, helping increase the sustainability of U.S. soy while reducing the farmer cost to do so. Based on market projections from Pure Strategies, a strategic consultant for Walmart, successful execution of the proposal will contribute to significant demand growth in food/meat products that are marketed with sustainability traits. The proposal has a KPI to influence multiple buyers to engage in a pilot program with USB for marketing sustainable soy. This further strengthens a strategic relationship with buyers and opens a new window for soybean producers – leveraging buyers’ marketing budgets to promote the sustainability of U.S. soy.

2: Value Impact
The proposal significantly differentiates the U.S. Soy Advantage – specifically the sustainability/continuous improvement element – by directly connecting buyers with resources that not only anticipate their future needs, but lead them to define soy sustainability in a way that profits soybean producers. The proposal’s effectiveness at convincing buyers to adopt the U.S. soy sustainability advantage in their own marketing is critical to its perceived value. Previous USB work with ADM demonstrated that food/meat products with credible sustainability traits are growing 30% faster than conventional food/meat products. If demand for U.S. soy-containing food products grows at this increased rate, so does demand for U.S. soy. If U.S. soy is only included in products without sustainability traits, growth will be stagnant or negative. Successful execution of the proposal will result in U.S. soy being preferred in food/meat products targeted for growth through sustainability marketing. Using projections from Pure Strategies, a strategic consultant for Walmart, this would result in a 45 million bushel per year increase in U.S. soy demand (equivalent to 30% growth in food/meat products that are marketed with sustainability traits). The proposal admits that its activity will not likely lead to a grower premium based on sustainability, but suggests that making U.S. soy the preferred ingredient in sustainable food/meat products will positively impact producer profitability by increasing volume demand.

3: Execution Feasibility
This proposal notes three potential technical barriers in execution feasibility, and outlines actions that will be taken to overcome those barriers. Risk is primarily reduced through the proposal’s strong network of partners. $44,500 in co-funding will be contributed by several partners, who provide the technical expertise needed to execute the proposed work. A majority of these partners are new to USB, and provide a necessary level of innovation to execute the proposal. The fact that buyers are actively seeking the type of resources provided by this proposal – and more often than not procuring these resources from groups not friendly to U.S. soy – indicates that buyers will readily embrace the proposed work and success is highly probable.

Section C: SPECIAL CONSIDERATIONS (optional)
This proposal helps achieve the LRSP milestone of increasing end user acceptance of U.S. soy sustainability, as a catalyst toward increasing high oleic soy (HOS) demand by 15 million bushels (38% increase over current USB projections) in 2018. It supports the market access roadmap, with specific focus on stage 3 (creation) of the market outreach track. As per Work Group request, the innovativeness is moderate, with a next-generation sustainability program that is endorsed by NGOs, as described in the proposal. The proposal receives leveraged funding of $788,000 from non-checkoff sources. The proposed solution will increase end user acceptance of HOS sustainability by designing a cutting-edge sustainability program and partnering with influential NGOs to endorse the sustainability of HOS. Executed successfully, the proposal projects that a credible HOS sustainability claim, combined with NGO influence in support of that claim, will accelerate HOS demand and help producers see increased net returns of $26M.

Additional strategic benefit will be new partnerships with leading NGOs. The proposal has already secured World Wildlife Fund (WWF) as a strategic partner, and will secure other NGOs as partners to promote the sustainability of U.S. soy. USB has not achieved this type of partnership – specifically the sustainability/continuous improvement element – by creating a sustainability program that will be co-promoted by NGOs to end users. The proposal has one NGO partnership already in place, with joint USB/NGO communications planned early in the proposal timeline. This is a significant differentiator because no other oilseed or other origin soy has such a partnership. The proposal uses certified sustainable palm oil as an example for calculating the potential profit to U.S. soybean farmers. Sustainable palm oil achieved a 41% cumulative annual growth rate from 2009-2016. The proposal projects a 38% increase (15M bushels) in high oleic soy adoption over current USB projections. This would translate into increased net returns to soybean farmers of $26M in 2019 and $48M in 2020, based on USB projections for baseline HOS demand. There also may be a benefit to commodity soybean oil, because of the positive perception of NGOs helping promote the U.S. Soy Advantage, though this value is harder to quantify.

The combination of an innovative way to differentiate U.S. soy (NGO partnership) and a strong sustainability story for high oleic soy should influence more end users to adopt high oleic soy for its sustainability value. The palm oil example suggests that quantifiable profits are possible – and the proposed work will be held accountable for achieving those results.

Section C: SPECIAL CONSIDERATIONS (optional)
## Section A: PROPOSAL SUMMARY

U.S. soy has exceptional sustainability performance compared to other soy origins and oilseeds. Sustainability is a key point of differentiation and can help drive demand among those companies where sustainability is an important buying consideration, but also an opportunity where sustainability might not yet be a critical purchasing factor. This proposal is designed encourage Chinese feed millers to use U.S. Soybean Sustainability Assurance Protocol (SSAP) certification to secure any premiums that might be realized and to provide tools that will assist in communicating SSAP advantages to their downstream customers. Planned activities include direct meetings, exhibition booths at three national feed and animal industry conferences, social and traditional media outreach. This proposal is not interdependent with any other proposal, but does satisfy USB director requests to explore opportunities while maintaining core efforts.

## Section B: EVALUATION CRITERIA

### 1: Strategic Importance

| 0835: Accounting for nearly 30 percent of every soybean grown in the U.S., China is U.S. soy’s number one customer. In FY16, China imported 31.8 million metric tons (1,168,332,000 bu.) of U.S. soybeans (Source: USDA). However, the U.S. holds only 36.3 percent of the import market share in China for all soybean products, suggesting opportunities for growth (Source: USB Marketview Database). As reported during USB’s February 2017 board meeting, “Consumers are looking for products that are safe, simple and sustainable.” In fact, the global customer survey conducted spring 2017 suggests that 80 percent of those surveyed in China on average agreed that the sustainability of U.S. soy is important to the success of their business. This suggests that SSAP certification can be a key point of differentiation for U.S. soy and could boost U.S. soy market share. This proposal, therefore, addresses USB LRSP Sustainability-Demand Goal Objective E (In targeted markets the majority of end users request certified sustainable U.S. soy and overall market share for U.S. soy is increased). |

### 2: Value Impact

| Companies are more often seeking sustainably sourced ingredients. This is certainly the case in China which has imported 42 percent of the 5.8 million metric tons (213,092,000 bu.) of soybeans were exported SSAP certified (Source: USSEC). By 2021, the target is for one-third of all exports will be SSAP certified, with upwards of 60 percent of that demand coming from China. While the sustainability of U.S. soy is a fact, its value is based on perception more than a tangibility at this point. Therefore, USB should not expect this proposal to advance constituent pricing. The real value comes from building buyer recognition of the long-term sustainability of U.S. soy and what that can mean to the marketability of finished products to U.S. soy customers’ customers. This would drive adoption and build a preference for U.S. soy. |

### 3: Execution Feasibility

This proposal is not expected to leverage any third-party funding. Technical or marketing challenges are not expected in the execution of this proposal. This proposal should have a high degree of success if funded.

## Section C: SPECIAL CONSIDERATIONS (optional)
Section A: PROPOSAL SUMMARY

U.S. soy has exceptional sustainability performance compared to other soy origins and oilseeds. Sustainability is a key point of differentiation and can help drive demand among those companies where sustainably is an important buying consideration, but also an opportunity where sustainability might not yet be a critical purchasing factor. This proposal targets crushers, buyers, and end-users to build awareness of U.S. sustainability among these entities directly and through many trade associations that can extend the reach of USB’s messaging efforts. This proposal explores opportunities for building demand for sustainability assurances in the Americas, Europe, and the Middle East / North Africa, helping to realize a key USB LRSP objective to accept the sustainability of U.S. soy and will seek U.S. soy oil and soy protein as a sustainable ingredient (objective F). At the same time, this proposal will also reach crushers and buyers, impacting LRSP objectives A-D. A significant part of the budget for this proposal seeks funding to work with customers directly through a series of country-level meetings, seminars, and a trade mission, and indirectly through various associations. In addition, this proposal supports updates to the SSAP, ancillary marketing materials, and the SES site for certified shipments. We will also explore incorporating state and local programs into the SSAP. This proposal is not interdependent with any other proposal, but does satisfy USB director requests to explore opportunities while maintaining core efforts.

Section B: EVALUATION CRITERIA

1: Strategic Importance

As reported during USB’s February 2017 board meeting, “Consumers are looking for products that are safe, simple and sustainable.” For that reason, food companies are more often seeking sustainably sourced ingredients. The global customer survey conducted spring 2017 suggests that 79 percent of those surveyed on average agreed that “the sustainability of U.S. soy is important to the success of [their] business.” However, only 71 percent said they were familiar with the various metrics that define sustainability, suggesting an educational opportunity to differentiate U.S. soy from other origin soy.

2: Value Impact

Assessment of success comes in the form of surveys that track buyer awareness of the sustainability of U.S. soy and whether that makes a difference in their purchase habits. This should translate to an uptick in demand for certified sustainable U.S. soy. In FY17, 5.8 million metric tons (4,640,000 bu.) of soybeans were exported (Source: USSEC). By 2021, the target is for one-third of all exports will be SSAP certified soybeans.

While the sustainability of U.S. soy is a fact, its value is based on perception more than a tangibility. The real value comes from building buyer recognition of the long-term sustainability of U.S. soy and what that can mean to the marketability of finished products to U.S. soy customers’ customers. This would hopefully drive adoption of U.S. soy and build a preference for U.S. soy.

3: Execution Feasibility

This proposal has the potential to leverage third party funds from USDA/FAS totaling $208,332. We do not anticipate any technical or marketing challenges in the execution of this proposal. While some of the approaches presented in this proposal are new, largely driven by the prioritization that the LRSP brings forward, execution should be straight forward. This proposal should have a high degree of success if funded.

Section C: SPECIAL CONSIDERATIONS (optional)