State Soybean Incremental Value Improvement Analysis Approach
November 2014

Methodology

This analysis estimates the increase in value that would be generated by increasing the protein concentration of soybeans by 1% in 13 individual states. Individual soybean samples from the 2006-2013 USSEC soybean quality surveys were used to calculate the state average EPVs. These state averages are simple averages of the EPVs produced from each individual sample. Each sample is equally weighted in each individual year. Then, the state average EPV for each of the nine years is averaged together to obtain the base EPV for each state. It is important to note that the state level average EPV is the average of the individual sample EPVs for each state and not the EPV produced from the state's average soybean composition.

The EPVs for each sample are calculated using an adjusted market discount schedule intended to track the observed price discounts currently applied by the market and not the punitive discounts outlined by NOPA. This adjusted market discount schedule assumes a base protein content of 47.5/48.0% and is outlined below:

Below 46.00% - 1.5x the price per point of protein
46.00% - 46.99% - 1.0x the price per point of protein
47.00% - 47.49% - 0.5x the price per point of protein
47.50% - 48.49% - No discount
Above 48.60% - 0.5x premium

It is important to note that the premium awarded by the market for meal greater than 48.50% protein can be both an explicit premium of a higher price and an implicit premium of favorable market access.

MY 13/14 prices (October-September) were used to calculate EPVs and were sourced from the November WASDE report. They are the simple average of Decatur, IL crude soybean oil and 48 percent protein meal. The soybean hull price is a simple average of the monthly hull prices from the Central IL Soybean Processor Report (also Decatur, IL) for the same time period. The prices used are listed below:

Soybean Meal: $489.94
Soybean Oil: 38.2¢/lb.
Soybean Hulls: $174.99/ton

Using the discount schedules, prices and individual soybean compositions detailed above, a base EPV scenario was calculated per state. Again, this base EPV is calculated based upon the compositional quality of the beans grown in each state from 2006-2013. Then, the improved protein scenario was calculated by increasing the protein composition of each individual soybean sample by 1% and applying the same parameters as the base scenario to calculate each EPV. The state average EPVs from the base scenario were subtracted from the state average EPVs of the improved protein scenario to get the per bushel value gains by state.

The improvement in value was then described with a per acre value improvement by multiplying each state's 3-year average yield (bu/acre) from crop years 2012-2014 by the state's per bushel value increase.

Value Gain Estimate Results

| STATE | Incremental Value Created by a 1% Increase in Soybean Protein | |
	Per Bushel	Per Acre
OHIO	$ 0.19	$ 9.25
MICHIGAN	$ 0.20	$ 8.83
INDIANA	$ 0.21	$ 10.62
KENTUCKY	$ 0.22	$ 10.00
ILLINOIS	$ 0.22	$ 11.16
KANSAS	$ 0.24	$ 7.70
MISSOURI	$ 0.24	$ 9.07
IOWA	$ 0.26	$ 12.33
NEBRASKA	$ 0.26	$ 12.96
WISCONSIN	$ 0.27	$ 11.26
MINNESOTA	$ 0.29	$ 12.43
SOUTH DAKOTA	$ 0.30	$ 11.35
NORTH DAKOTA	$ 0.33	$ 10.81

Observations

Note that these value increases represent the impact of a hypothetical scenario where the average protein content of every sample is increased by 1% at 13% moisture. For example, moving from 35% protein in the soybean to 36%. The oil content is assumed to remain constant in all cases. Such a shift in composition across all soybeans grown within a region or state is highly unlikely within a period of a few years. However, such a shift may be possible with a concerted industry-wide effort focused on protein improvement.

The per acre impacts are influenced fairly strongly by the differentials in yields. In some cases, this changes the order rankings among states.

Soybean meal price assumptions for this analysis are relatively high in historical terms. This has the impact of making the estimated value gains higher than if lower baseline prices were used.