SOYBEAN GROWTH AND DEVELOPMENT

MANAGING A SOYBEAN CROP THROUGH GROWTH STAGES

How soybeans grow and develop plays an important role in managing the crop. Since a soybean plant’s vegetative and reproductive growth stages occur for several weeks, many environmental conditions can affect final yield. For example, too much or too little moisture at specific stages can affect performance. The information below can help you determine the proper timing of various management practices.

MANAGEMENT PRACTICES

EMERGENCE

During the germination and emergence process, when the soybean plant grows through the soil, damage can occur to the roots and young plant as it begins to grow. From seed to emergence, soybean seedlings can absorb 25% of the total moisture required for seedling growth. A fully emerged soybean plant should be able to absorb all needed moisture from the soil. Inadequate seed moisture and cool soil temperatures can prevent proper emergence.

Management Practices: Scout for proper emergence; check seed lots and quality. Optimize planting depth values from 1-2 inches soil depth. Optimize planting depth and cooler soil temperatures can improve proper emergence if stands are poor; repriplanting may be needed.

COTYLEDON

Unibudding leaves expand (leaf edges are not budding); the cotyledons are the two round reserves for plant growth. Cotyledons (2) to (3) days); damaged cotyledons can impact yields.

Management Practices: Scout for proper emergence; check seed lots and quality. Do not replant under stressed soil and water conditions. Late emergence can result in lodging issues. If planted too late; replanting may be needed.

FIRST TRIFOLIATE

Two trifoliates unroll (fully developed leaflet at the node above the unibudding node). The plant becomes self-sustaining as newly developed leaves can carry out photosynthesis. From this point onward, new nodes will appear every 3 to 5 days until reproductive stages. Effective nodulation results in higher fixation activity. Nodulation has been established on the roots and above the nodes on main stem with a fully developed leaf. Almost 50% of nitrogen uptake occurs around this stage.

Management Practices: Scout for early season weeds, insects and diseases. Apply post-emergence herbicides if needed. If evaluation has been established effectively, nitrogen recommendation is not recommended and a suppressive band in quantities will inhibit nitrogen fixation.

SECOND TRIFOLIATE

Two trifoliates unroll (fully developed leaflet at the node above the unibudding node). Check for proper inoculation. Fixation has been established at the roots of this stage and nitrogen fixation continues until reproductive stages. Effective nodulation results in higher yields and more protein when compared with non-nodulated soybean plant.

Management Practices: Scout for early season weeds, insects and diseases. Apply post-emergence herbicides if needed. If evaluation has been established effectively, nitrogen recommendation is not recommended and a suppressive band in quantities will inhibit nitrogen fixation.

REPRODUCTIVE STAGES

BEGINNING FLOWERING

Plant has one flower open on any node on the main stem. Indeterminate plants start at the bottom and then grow upward. Determinate plants start at the top four nodes and flower downward.


FULL BLOOM

Soybean plant has one open flower on one of the two uppermost nodes on the main stem with a fully developed leaf. Almost 90% of nitrogen uptake occurs around this stage. Development of the node at the beginning of the vegetative period of plant development is termed cold determination.


BEGINNING POD

Pods are 3/4 inch (1.90 mm) long on one of the four uppermost nodes on main stem with a fully developed leaf.

Management Practices: Scout for insects and diseases. Spray foliar insecticide or fungicide, if needed. Inspect earlier pod formation. Integrate critical at this stage, when plants are most susceptible to diseases. Late-season hail damage to the leaf area at this stage severely affects pod yield.

FULL POD

Pods are 3/4 inch (1.90 mm) long on one of the four uppermost nodes on main stem with a fully developed leaf. Prioritize control of early pod blight and late pod blight. Late-season hail damage to the leaf area at this stage severely affects pod yield.

Management Practices: Scout for insects and diseases. Late-season diseases can severely lower yields. Integrate critical at this stage. Peak water use can reach 2 to 3 inches/day. Spray foliar insecticide or fungicide, if needed.

BEGINNING SEED

Seed is 1/8 inch (0.32 mm) long on one of the four uppermost nodes on main stem with a fully developed leaf. Prioritize control of early pod blight and late pod blight. Late-season diseases can severely lower yields. Spray foliar insecticide or fungicide, if needed.

Management Practices: Scout for insects and diseases. Late-season diseases can severely lower yields. Late-season hail damage to the leaf area at this stage severely affects pod yield.

FULL SEED

Pod containing a green seed that fills the pod cavity on one of the four uppermost nodes on main stem. Most nodules have been taken up by the time the plant reaches R6 stage.

Management Practices: Scout for insects and diseases. Late-season diseases can severely lower yields. Spray foliar insecticide or fungicide, if needed.

BEGINNING MATURITY

One pod on the main stem has reached mature pod color.


FULL MATURITY

Approximately 9 to 11 days before harvest, pods should reach full maturity. When 90% of pods have reached mature pod color.

Management Practices: Scout for green stem syndrome. If the plant is still green, the best option is to harvest early and make sure the harvesting equipment is sharp and in optimal operating conditions.