

Soybean Management in Late Season

KEY POINTS

- Keeping a soybean crop healthy, even late in the season, is important for maximizing yield potential.
- Reducing insect, disease, and weed pressure, nitrogen deficiency, and drought stress during the critical growth stages for soybean development can help prevent potential yield loss.
- Early canopy development can increase flowering time and number of main-stem nodes. Proper disease and insect identification is a critical management step.



Figure 5. Pod and stem bight Photo source: Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org.



Figure 6. Stem infected with stem canker, slight discoloration of the cortex is present and reddish brown cankers are evident.

Insects

Soybean aphids. Soybean aphids (*Aphis glycines*) (Figure 1, Page 2) are considered the major insect pest in mid-west soybean (*Glycine max*) fields. Aphids are small, 1/16th inch long, and range from pale yellow to lime green in color. Adults have distinct black cornicles. They are usually found in soybean fields from late May through August. Aphids have piercing-sucking mouthparts that are used to suck fluids from the plant. Although they feed on leaves, stems, and pods they are most often found on the underside of leaves.¹ Heavy infestations can result in the stunting of plant growth and development, which can reduce yield potential. If feeding continues through the pod filling stage, pod set may be affected and plants may produce fewer seeds per pod.² As much as 50% yield reductions may occur in severely infested fields. However, aphid populations that are over the threshold when pods are being filled can have a greater effect on yield potential than outbreaks at R5 or R6 growth stages. The occurrence of aphids is highly variable each season. Treatment thresholds and recommendations vary by state. Please contact your local agronomist for thresholds and apply insecticides as needed.

Stink bugs. The three species of stink bugs mostly found in soybean fields are green stink bug (*Chinavia hilaris*) (Figure 2, Page 2), southern green stink bug (*Nezara viridula*), and brown stink bug (*Halyomorpha halys*).³ Stink bugs are shield shaped and immatures look similar to adults, but are wingless. The damage from stink bugs is caused when they insert their piercing-sucking mouthparts into the plant and extract juices. Damage is greatest when they feed on the seed in the developing pod (Figure 3, Page 2). Feeding can cause pods to drop. Both adults and nymphs can cause injury to soybeans.

Diseases

Frogeye leaf spot, sudden death syndrome, stem canker, phytophthora root rot, charcoal rot and pod and stem blight (PSB) are fungal diseases that may affect soybean plants late in the season.⁴

Frogeye leaf spot produces spots on the leaves (Figure 4, Page 2), while interveinal yellowing may form with sudden death syndrome (SDS) and stem canker (Figure 6). Premature defoliation is also a concern with frogeye leaf spot. Since pod set through seed fill stages (R3 through R6) are the most critical period for yield potential, leaf loss can significantly reduce yield potential. Healthy, green plant material is necessary for photosynthesis and converting sugars for pod fill; therefore, it is important to protect the leaf tissue.

PSB is seen when the plant matures at R8 and is characterized by parallel rows of bumps (pycnidia) on stem tissue. PSB can reduce yield if plants are not harvested soon after maturity.

White mold needs sprays around the R1-R2 stage of growth, Cercospora leaf blight and Frogeye are the most common diseases managed by foliar fungicides.

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PSB, cankers, Charcoal rot and Sudden Death Syndrome (SDS) cannot be managed with a foliar fungicide.

Tips for Proper Fungicide Application. Soybean diseases usually start in the lower canopy and move into the middle, then upper canopy as the crop matures. Therefore, fungicide applications need to be placed as deep into the canopy as possible. Sprayer reconfiguration is necessary to obtain good coverage and canopy penetration. Using a spray volume of no less than 15 gallons per acre is important to provide good coverage, especially later in the season when the canopy is deeper and denser. Nozzle type, spray pressure, application volume, and speed will determine the uniformity of spray deposition and penetration into the canopy.⁵ Flat-fan pattern nozzles are generally the best choice, provided the spray from these nozzles is characterized as high-fine to mid-medium (200-300 micron droplets in diameter). Proper nozzle orientation and overlap is also critical to achieve optimum spray deposition.

Weed Management

Weeds compete with the crop for light, moisture, and nutrients and can be a yield-limiting factor. For increased yield potential, weeds must be controlled between V1 and V3 soybean stage. This is usually referred to as the critical time for weed control.⁷ Early season weed control is important for early canopy development and maximizing soybean yield. Plants that develop canopies early may have an increase in flowering time and number of main-stem nodes. Weeds that emerge later in the season have little direct effect on yield potential, but may interfere with harvesting and add foreign matter to the harvested crop. Although good early-season weed control is critical for optimum yield potential, sometimes situations arise where in-season weed management is warranted. Over-the-top applications can be used in controlling late-germinating weeds and weeds not controlled by preplant or preemergence herbicides.⁷ If a herbicide application is necessary, choose the chemistry depending upon the type of weed (s) present in the field.

Water Stress

Water demand is highest for soybean plants during pod development (R3-R4) and seed fill (R5-R6). Moisture stress from flowering through the pod fill stage can severely reduce yield potential by producing smaller or fewer seeds or both.⁸

Application of Nitrogen

Since a soybean plant produces nutrient rich, high protein seed, nitrogen (N) requirements for this crop are rather high. Peak N demand in soybean production is during pod fill and fixed N alone may not be enough to meet plant demand. Both soil N and fixed N may be necessary for maximum soybean yield potential. Research shows that supplemental N during pod fill may increase yield potential if plants are indicating they are nitrogen deficient.

Scouting soybean fields late in the season can help identify problems that may be controlled through targeted management strategies and may offer insight for the next growing season. Look for insect damage, weed escapes, and signs of diseases. Late-emerging weeds can cause harvest losses and increase moisture and trash content at harvest. Fields should be monitored for pod-feeding insects through R7 growth stage. Late-season irrigation is recommended to have adequate soil moisture to ensure maximum seed weight. A fungicide application is warranted when disease incidence reaches threshold levels.



Figure 1. Soybean aphids.



Figure 2. Green stink bug.



Figure 3. Stink bug pod damage.



Figure 4. Frog-eye leaf spot.

¹ Tilton, K.J., Hodgson, E.W., O'Neil, M.E., D.W. Ragsdale, 2011. Biology of the soybean aphid, *Aphis glycines* (in the United States). Journal of Integrated Pest Management, Vol 2, No. 2

² Soybean aphid, speed scouting worksheet, Field Crops IPM, Purdue University. <http://extension.entm.purdue.edu>.

³ Soybean insect pests. Dr. Dominic Reisig, North Carolina Cooperative Extension Service, <http://ipm.ncsu.edu>.

⁴ Late season soybean diseases. Laura Sweets, 2013. University of Missouri Extension. www.ipm.missouri.edu.

⁵ Dorrance, A., Draper, M.A., and Hershman, D.E. 2008. Using foliar fungicides to manage soybean rust. Plant Health Initiative. NCERA publication SR-2008

⁶ Knezevic, S.Z., Evans, S.P., and Mainz, M. 2003. Yield penalty due to delayed weed control in corn and soybean. Plant Management Network. <http://www.plantmanagementnetwork.org>.

⁷ Ferrell, J.A., MacDonald, G.E., and Leon, R. 2012. Weed management in soybean. University of Florida, SS-AGR-05. <http://edis.ifas.ufl.edu>.

⁸ Thomas J. G. and Blaine, A., 2010. Soybean irrigation, Mississippi State University Extension, publication number 2185. <http://msucares.com>.

Web sources verified 070818 130627060107.

Performance may vary from location to location and from year to year, as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible and should consider the impacts of these conditions on the grower's fields. **ALWAYS READ AND FOLLOW PESTICIDE LABEL DIRECTIONS.** 130627060107 071518HKG