Late Season Soybean Management

- 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.

Soybean Insects

Soybean aphids (Aphis glycines) are considered the dominant insect pest in soybean fields. Aphids are small, 1.5 mm 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.

Soybean podworm (Helicoverpa zea), also known as corn earworm, can be especially problematic in the southern growing regions of the United States. Infestation normally occurs from late July through August. It is a major pest in soybeans, corn, cotton, and grain sorghum. Small larvae are usually brown with a dark head. As the larvae grow, they change color from yellowish green to black, and the head is usually orange on large larvae. While small larvae feed on tender leaves and blooms, larger larvae feed on leaves, stems, or pods. Large populations can cause severe defoliation. Once pods begin forming, larvae feed on pods causing severe damage.

Stink bugs. The three species of stink bugs mostly found in soybean fields are green stink bug (Acrosternum hilare), southern green stink bug (Nezara viridula), and brown stink bug (Euschistus servus).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 4). Feeding can cause pods to drop. Both adults and nymphs can cause injury to soybeans.

Soybean Diseases

Frogeye Leaf Spot (Cercospora sojina), Sudden Death Syndrome (Fusarium virguliforme), Stem Canker (Northern states—Diaporthe phaseolorum var. caulivora, Southern states—D. phaseolorum var. meridionalis), Phytophthora Root Rot (Phytophthora sojae), Charcoal Rot (Macrophomina phaseolina), and Pod and Stem Blight (Diaporthe phaseolorum var. sojae) are fungal diseases that may affect soybeans late in the season.4

Frogeye leaf spot produce spots on the leaves (Figure 5), while interveinal yellowing may form with sudden death syndrome (SDS) and stem canker. Premature defoliation is also a concern with frogeye leaf spot, phytophthora root rot and stem canker. 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.
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Pod and stem blight can be found on stems, petioles, and pods in the late reproductive stages as irregularly-shaped brown blotches. Infection on pods may result in fewer or smaller seeds per pod. Leaf defoliation is also an issue if infestation is severe.

Symptoms of stem canker first appear during the early reproductive stages as small, red-brown lesions (Figure 7). Initial lesions are usually found near a lower leaf node and expand lengthwise as the season progresses. Lesions eventually girdle the stem, causing withering and plant death.

Fungicide applications should be considered if the infestation has reached threshold levels during pod developmental stages (R3 to R5). Spraying fungicides after R6 is generally not recommended.

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. Preraper 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. Flat-fan pattern nozzles are generally the best choice, provided the spray from these nozzles is characterized as high-fine to mid-medium (200 to 300 micron droplets in diameter). Proper nozzle orientation and overlap is also critical to achieve optimum spray deposition.

Figure 6. Pod and Stem Blight. Photo source: Clemson University - USDA Cooperative Extension Slide Series, Bugwood.org.

Figure 7. Stem infected with stem canker: slight discoloration of the cortex is present and reddish brown cankers (at arrow) are evident.

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. Early season weed control is important for early canopy development and maximizing yield potential in soybeans. 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. 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 to R4) and seed fill (R5 to R6). Moisture stress from flowering through the pod fill stage can severely reduce yield potential by producing smaller or fewer seeds or both.

Nitrogen Application

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 these pod fill may increase yield potential.

Summary

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.

Sources:
2. Soybean aphid, speed scouting worksheet, Field Crops IPM, Purdue University. http://extension.entm.purdue.edu
4. Late season soybean diseases. 2013. University of Missouri Extension. www.ipm.missouri.edu
Web sources verified 05/13/2015.

For additional agronomic information, please contact your local seed representative. Developed in partnership with Technology, Development, & Agronomy by Monsanto.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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