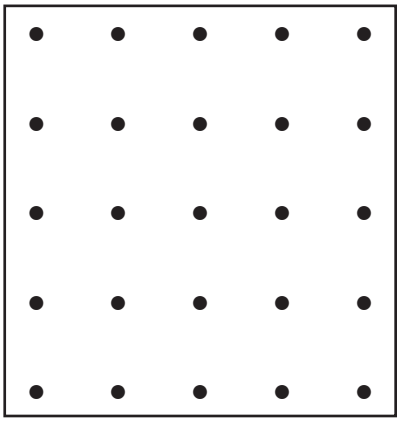
2020 Advanced Crop Advisers Workshop

KEY POINTS about field crop insect management:

Recognize insect feeding injury



- start looking before you expect to see them and sample on a regular basis
- scout the entire field and use a defined pattern for an unbiased estimate
- chewing insects will defoliate, skeletonize, clip plant tissues, or girdle stems (e.g., beetles, grasshoppers, caterpillars)
- piercing-sucking insects cause discoloration, stippling, mottling, punctures, and stunting (e.g., aphids, hoppers, stink bugs)

Economics is the keystone to IPM

- understand the pest: identification, life cycle, population dynamics, and injury potential
- economic injury level: lowest pest population density that will cause economic injury (i.e., bushels per acre in field crops)
- economic threshold: lowest pest population density at which action should take place to avoid economic injury (i.e., pests per plant or percent defoliation)

Use pest biology and economic thresholds to make treatment decisions

- minimize unnecessary input costs
- protect non-target species (e.g., beneficials, pollinators, other animals, and humans)
- minimize flares of secondary pests
- prolong insecticide efficacy and delay genetic resistance to major chemistries

Important application considerations

- be aware of various pre-harvest intervals on labels (e.g., 45 or 60 days)
- strive for 100% kill with uniform coverage, and sufficient volume and pressure
- leave untreated check strips (2-3 is ideal) to compare yield to treated areas
- assess product efficacy and coverage after application 3 days after application
- continue to scout for pest activity

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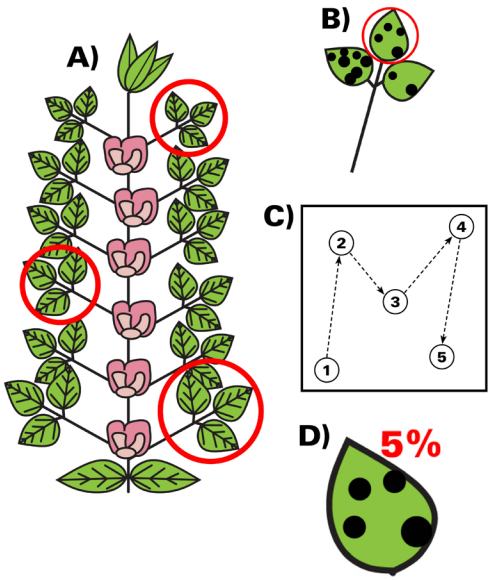
KEY POINTS about defoliating field crop pests:

- likely there are a multiple pests feeding at the same time
- people tend to over-estimate defoliation in field crops
- estimate loss of leaf area on whole plant and the entire field (or use this scouting guide)
- Use 30 vegetative and 20% reproduction defoliation threshold guidelines
- insects feeding directly on pods/seeds are of higher concern (e.g., grasshopper, bean leaf beetle, etc.)

Estimating insect defoliation in soybean

1. Walk at least 10 rows into the field.
2. Take a trifoliate from the top, middle and bottom of a randomly-selected plant (A).
3. From each trifoliate, remove the leaflet with most defoliation and the trifoliate with the least defoliation. Keep the remaining leaflet (B).
4. Stop at 9 more randomly-selected plants in the area and repeat #3.
5. Move to four more areas in the field, repeating #3 and #4 (C). You will end up with 50 leaflets for the field.
6. Estimate the percent defoliation of each leaflet (D) and calculate the average for the entire field.
7. Consider a foliar insecticide to protect yield if the average defoliation is above 30% for vegetative soybean and above 20% for reproductive soybean.



KEY POINTS about soybean gall midge:

- confirmed in 92 counties in IA, NE, MN, MO, and SD
- third instars are bright orange, legless, and 1/4" in length; drop from the plant to pupate
- larvae (maggots) feed on the inside of the stem near the soil line
- base can be enlarged and discolored; dark lesions eventually form on plant
- infested plants quickly wilt and become brittle at the base; easily crack at soil line
- plant death generally noted as field edges first
- injury can be confused with fungal pathogens
- maggots can be feeding from mid-June to early September; estimate of three generations per year
- foliar insecticides aimed at adult suppression were not effective
- late-planted fields (June) were less attractive sites and experienced less injury/plant death

Mitchell Helton, ISU 2019