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KEY POINTS

- Aphids are a common pest of corn and related grass crops but rarely cause economic levels of damage.
- The reproductive habit of aphids allows populations to increase very quickly; however, they can also crash quickly, as aphids are highly susceptible to several natural predators, parasitoids, and pathogens.
- There are no research-based economic thresholds for insecticide treatments, but applications may be justified in drought stressed or late-planted fields with high and increasing aphid populations.

APHID SPECIES IN CORN

- Aphids are a worldwide pest of corn and related grass crops, present nearly everywhere corn is grown.
- In the Midwestern U.S., at least four aphid species are known to infest corn:
 - Corn leaf aphid (*Rhopalosiphum maidis*)
 - Bird cherry-oat aphid (*Rhopalosiphum padi*)
 - English grain aphid (*Sitobion avenae*)
 - Greenbug, or wheat aphid (*Schizaphis graminum*)
- Of these aphid species, the corn leaf aphid and bird cherry oat aphid are the most common in corn.
- Species identification is not critical from a management perspective; aphids all feed on corn plants in the same way.



Figure 1. A severe infestation of corn leaf aphids in pre-tassel corn. Treatment may be needed when infestation is severe and tassels are covered prior to pollination.



Corn Leaf Aphid

- Blue-green color, trimmed in black
- Black head with medium length black cornicles or “tailpipes”
- Short black antennae and black legs



Oat-Bird Cherry Aphid

- Dark green, medium length black tipped cornicles.
- Reddish brown saddle at the base of the cornicles.
- Green or gray legs. More round than corn leaf aphids.



English Grain Aphid

- Dark green, medium length black tipped cornicles.
- Reddish brown saddle at the base of the cornicles.
- Green or gray legs. More round than corn leaf aphids.



Greenbug

- Light green with brighter stripe down the back.
- Cornicles long with black tip, green legs and antennae

CROP IMPACT

- Aphids have piercing sucking mouthparts and feed on the sap from the plant phloem tissue.
- Excess sap ingested is secreted as sticky honeydew. The honeydew can promote growth of sooty mold that may interfere with plant photosynthesis.
- Aphids can cluster in large numbers on the upper portion of corn plants.
- Prior to tasseling, aphids may be found inside the whorl, on the developing tassel, and on upper leaves of the plant.

- The aphid colony may expand to the tassel when it emerges, which can interfere with pollination.
- Post-pollination, colonies of aphids are often found on the husks of the developing ear, on the ear leaf, or on the stalk.
- Aphids have the greatest potential to cause crop injury when they are feeding within the whorl prior to tassel emergence.
- Heavy infestations can turn leaves red or yellow from nutrient loss and stress and ultimately cause them to die (Figure 2).
- The main impacts of post-pollination infestations are interference with pollination in cases of heavy feeding and honeydew excretion on the tassel as well as inhibition of photosynthesis caused by sooty mold on the upper leaves.



Figure 2. Left: A heavy infestation of corn leaf aphids on the tassel and upper leaves of a corn plant. Right: A corn plant where some of the upper leaves have been killed by aphid feeding inside the whorl prior to tasseling.

LIFECYCLE AND POPULATION DYNAMICS

- Aphids develop through gradual metamorphosis with multiple nymph stages. Skins that are shed during molts are often visible in colonies of aphids (Figure 3).
- Aphid populations are composed almost entirely of females.
- Aphids reproduce without mating, are born pregnant, and give birth to live young, which can allow populations to rapidly explode under favorable conditions.
- Most aphids are wingless. Winged females will begin to appear when a colony becomes stressed and overcrowded.
- Aphid populations can increase rapidly but they can also crash very quickly — aphids are highly susceptible to multiple natural enemies including lady beetles, lacewings, syrphid flies, and several species of parasitic wasps.
- Aphids are also susceptible to infection by *Entomophthora* fungi. Aphid survival can be favored by dry weather or application of foliar fungicides, both of which inhibit the growth of fungal pathogens.



Figure 3. A mixed colony of corn leaf aphids (*Rhopalosiphum maidis*) and bird cherry-oat aphids (*Rhopalosiphum padi*). The white objects are shed skins (not dead aphids) that are produced during a molt to a larger size.

MANAGEMENT CONSIDERATIONS

- Aphids are common in corn fields but rarely cause economic levels of damage, and there are no research-based treatment thresholds for aphids in corn.
- Aphids have the greatest potential for causing plant injury while they are feeding within the whorl prior to tassel emergence and on the tassel during pollination.
- Insecticide treatment may be needed if more than half of the corn tassels in a field are covered with aphids prior to the completion of pollination.
- Aphids are less likely to cause damage after pollination has been completed.
- Insecticide treatment may be considered in fields that meet some or all of the following criteria:
 - The field is experiencing drought stress.
 - The field was planted late.
 - High aphid population is present (over 80% of plants infested) and the population appears to be increasing.
 - Infestation extends beyond the perimeter of the field.
 - The field is not yet near-ing dent stage.
 - Sooty mold is developing on the leaves, stalk, or ear.
 - There are no signs of natural predators or *Entomophthora* fungus reducing the population (Figure 4).



Figure 4. Aftermath of an aphid infestation. There are almost no live aphids present; rather there are numerous dead mummies (the round tan objects) of aphids killed by parasitoid wasps, shed skins, and sooty mold growing on honeydew.

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