



Bird Cherry-Oat Aphid

The bird cherry-oat aphid, *Rhopalosiphum padi* (L.), is a common inhabitant of Kansas wheat. It is more often associated with yield losses from barley yellow dwarf virus than any other aphid species. One of the largest aphids found on wheat, it is common in the fall and is the first aphid to be active in the spring. The aphids cause little direct feeding damage on wheat, but populations of 20 or more per tiller at the boot stage to heading stage could reduce yields.



Description

The bird cherry-oat aphid is about 1/16-inch long, soft bodied, and somewhat pear shaped (Figure 1). It is dark olive green with a reddish-brown patch on its back surrounding the base of the cornicles or "tailpipes." This dark, reddish-brown patch is probably the aphid's most distinguishing characteristic. Under cool conditions, the patch may so dark that it is difficult to see. The tips of legs, antennae, and cornicles are black.

Figure 1

Adults may be winged or wingless. Winged forms are darker than the wingless forms. Winged aphids are produced under stressful conditions such as unfavorable weather, overcrowding, and reduction in food quality. Wings allow them to migrate over longer distances in search of more favorable host plants.

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Life cycle

Bird cherry-oat aphids primarily reproduce asexually through parthenogenesis. Parthenogenesis is an asexual form of reproduction in which females give birth to living young, or nymphs, without mating.

Within 10 to 14 days, depending on temperature, nymphs will have passed through the molting stage and become capable of reproducing. The rapid development and asexual reproduction allow the bird cherry-oat aphid to reach tremendous population densities in a short time. With the approach of cold weather, the female gives birth to winged males and females. Winged sexual forms (males and females) mate and produce eggs for overwintering, mostly on winter cereals and native grasses. In the spring, overwintering eggs hatch into females that move into nearby wheat fields and start colonies, producing nymphs parthenogenetically (Figure 2).

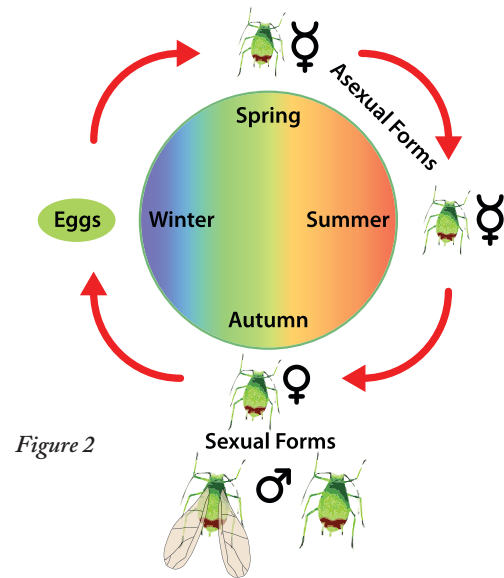


Figure 2

Damage

Bird cherry-oat aphids are common in the fall and are the first aphids to be active in the spring. In early September, the aphids begin to migrate from cereal stubble and native grasses to newly planted and volunteer wheat or other winter cereals. Fall feeding damage is negligible, but the aphids are efficient vectors of barley yellow dwarf virus when plants are in the seedling stage. Infection in younger plants is potentially more damaging than infection on mature plants in the spring.

Barley yellow dwarf virus causes barley to turn yellow, and infected plants become stunted and nonproductive. Diseased wheat and oat plants turn reddish and become stunted (Figure 3). In Kansas, infections seem to be mostly associated with bird cherry-oat aphid infestations. The aphids can

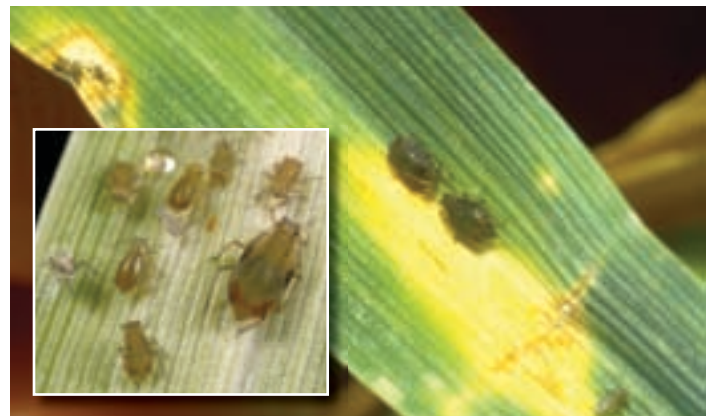


Figure 3

acquire the virus by feeding on infected plants for as little as 30 minutes, but 12 to 30 hours of feeding usually is required. After a four-day latent period, infective aphids can transmit the virus to healthy



Figure 4

plants for as long as they live — about 21 days under normal conditions. Winged bird cherry-oat aphids spread virus across the field in a scattered pattern because of their rapid movement. Once aphids settle down and produce wingless forms, the infection may spread in the field more uniformly due to limited movement from plant to plant.

Bird cherry-oat aphids feed on plant sap by piercing the leaf, leaf sheath, or stem tissues near or just below the soil line, where they are easily overlooked. Heavy populations (20 or more per tiller at the boot stage to heading stage) in the spring may cause the flag leaf to roll into a cork-screw shape, trapping the awns and resulting in fishhooked heads. Evidence of feeding injury may be seen on the leaves, along with carcasses of dead aphids and cast skins on the foliage, around plants, and on the ground. Like other aphids, bird cherry-oat aphids excrete sugary liquid waste called honeydew, and heavy infestations cause plants to glisten and become sticky. Studies have shown a 5 to 9 percent yield loss when populations exceed 20 to 40 aphids per tiller (400 to 800 per foot of row) for 10 days before the booting stage in wheat.

Management options

Avoid spraying for bird cherry-oat aphids in Kansas in the fall. Generally, they don't appear to cause serious damage. Infestations are often around and below the soil line where they can be hard to control with foliar sprays. They are not winter-hardy, and numbers usually start to decline with the onset of cold weather.

Occasionally, aphid populations rebuild during the spring, probably carried in by southerly winds. The economic threshold is not well defined, but if spring scouting reveals a field-wide average of 20 or more aphids per tiller and fewer than 10 percent of tillers with lady beetles or parasitized aphids (mummies), treatment might be justified, given average yield potential.

Planting date: Delaying planting to near the fly-free date generally reduces the chances of bird cherry-oat infestation in the fall. Early plantings generally have greater bird cherry-oat aphid numbers and higher incidence of barley yellow dwarf virus than late plantings.

Destruction of volunteer wheat: Bird cherry-oat aphids, like other wheat pests, use volunteer wheat and cereal stubble as a staging ground to attack new wheat stands. Timely destruction of volunteer wheat and infested stubble may help prevent infestation.

Seed treatment: Depending on the rate, seed treatment-containing neonicotinoid compounds imidacloprid and thiamethoxam provide significant activity against bird cherry-oat aphids in the fall and, in some cases, have shown good activity into the spring.

Foliar treatment: Insecticide applications usually are not effective in reducing the incidence of barley yellow dwarf virus and are not recommended. But treatment for the aphids may be advisable in the spring if the threshold is reached before beneficial insects become active. Look for ladybeetles and their alligator-like larvae on wheat, and brown, dried up husks of parasitized aphids (mummies) adhering to leaves. Beneficial insects such as parasitic wasps and ladybeetles become increasingly effective in reducing bird cherry-oat and other aphid populations in wheat as temperatures warm in the spring. They often eliminate aphid populations before treatments are required.

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All photos by Phil Sloderbeck, Kansas State University

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