

Black Walnut Curculio

Black walnut curculio (*Conotrachelus retentus*) is commonly found in regions of North America where black walnut (*Juglans nigra*) trees are grown (Figure 1). Curculio feed primarily on succulent leaves, elongated clusters of male flowers called catkins, pistillate (female) flowers and young fruits of black walnut trees, but they also occasionally feed on butternut (*Juglans cinerea*) trees. Females chew into the developing walnut fruits in May, often forming a crescent-shaped area, and deposit their eggs into the tissue (Figures 2 and 3). Nut loss occurs after the eggs hatch and larvae eat the tissue inside the fruit that would otherwise develop into the kernel. As larvae grow, the infested fruit falls prematurely from the tree, an event known as “June drop.” Trees heavily infested with black walnut curculio can lose up to half of their nuts.

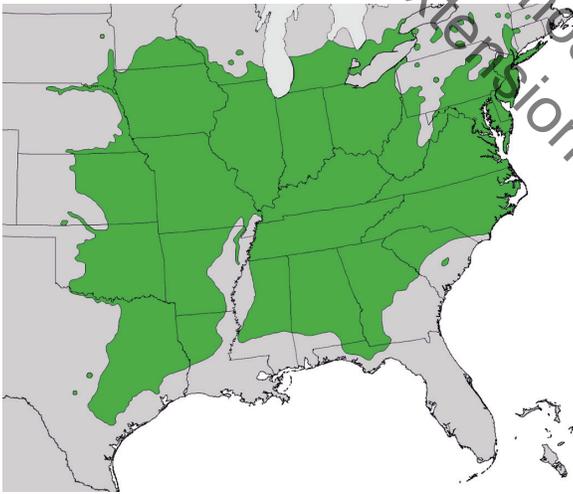


Figure 1. Native range of black walnut trees where curculio are found. (Source: Little, Elbert L. Jr. 1971. Atlas of United States trees. Vol. 1, Conifers and important hardwoods. U.S. Department of Agriculture.)

Identification

The black walnut curculio larva is large (up to about $\frac{7}{16}$ inch, or 11 mm, long) and has a white body with short stiff hairs and a dark brown head (Figure 4). Larvae are found inside a developing fruit.

The pupa, also white, is about $\frac{3}{8}$ inch, or 9 mm, long and covered with prominent reddish-brown hairs (Figure 5). Pupae tunnel into soil to a depth of 2 to 4 inches.

Adults have a long snout and a brown ridged body that is about $\frac{1}{4}$ inch, or 6 to 7 mm, long; mottled with lighter tan patches; and covered with fine, soft short beige hairs (Figure 6). Adults are elusive during the day and commonly feign death when disturbed. After remaining motionless for several seconds, they quickly move to protected, often shaded sites where they are hidden from view.



Figure 2. Curculio preparing to lay eggs on a black walnut fruit.

Biology

Two generations of black walnut curculio are found in Missouri. The overwintering adults emerge from the soil in the spring, generally between April 10 and 27 in Missouri. As fruits develop, females chew into the fruit and deposit multiple eggs into the tissue. Larvae begin feeding on the tissues inside the fruit and develop over a period of about eight weeks. When the larvae are about half grown, usually in June, the fruit drops to the ground, where larval feeding continues.

When fully grown, usually a single larva exits each infected fruit and burrows into the soil to pupate. The pupal stage lasts about three weeks, and the second generation adult curculios emerge from the soil in mid-July through August. The newly emerged adults feed on the walnut foliage along with adults from the previous generation until leaf drop. The older generation dies in late fall, and the newer generation goes back to ground to overwinter near the trunk of the tree.

Feeding damage on fruits and nut drop rarely occur in the fall because the fall generation of curculios will not reproduce until spring.



Figure 3. Crescent-shaped scar and curculio egg on a developing black walnut fruit.

Written by
Michele Warmund, Fruit State Specialist, Division of Plant Sciences



Figure 4. Black walnut curculio larva.



Figure 5. Black walnut curculio pupa.



Figure 6. Adult black walnut curculio on a catkin.

Management

Curculio populations can be reduced by removing adults from the tree canopy. As soon as tree growth begins in the spring and throughout May, curculio can be jarred from trees in the early morning when they are less active, by tapping branches and collecting the adults on a dropcloth placed under the tree canopy. Once collected, adults should be destroyed.

Sanitation can also limit dispersion of curculio in plantings. Removing immature fruit as soon as crescent-shaped ovipositional scars are visible or picking up larvae-infested fruit immediately after it has fallen to the ground will suppress future generations of curculio.

Currently, pheromone traps are not available for trapping curculio. Although curculio soil emergence traps or pyramidal weevil traps are effective, many are needed in plantings, thus making them impractical in orchards.

Insecticides may be applied after bud break when flowers are visible, generally from early to late May in central Missouri, to control curculio. Currently, products such as Asana, Warrior, Imidan and Sevin are labeled for walnut insect control. Consult product label for rates of application as these may change. Asana XL and Warrior are restricted-use pesticides and may be applied only by certified applicators or workers under their direct supervision. Adequate coverage of trees with spray material may be feasible when trees are young, but pesticide application for walnut trees often becomes impractical as trees reach maturity.

The University of Missouri intends no endorsement of products named here or criticism of similar products that are not mentioned.

ALSO FROM MU EXTENSION PUBLICATIONS

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- AF1011 *Growing Black Walnut for Nut Production*
- XM1001 *Flowering and Fruit Characteristics of Black Walnuts: A Tool for Identifying and Selecting Cultivars*

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