

Citrus Root Weevil Identification and Control in Southern Highbush Blueberry

Introduction. Citrus root weevil (*Diaprepes abbreviatus*) has been a destructive pest in citrus trees for many years. More recently, it has become a pest in blueberry in central Florida, at times causing significant damage.

The citrus root weevil has a life cycle consisting of egg, larva, pupa, and adult. Eggs are deposited by adults between two leaves, or within a folded leaf, held together by an excreted adhesive. The eggs are oblong-oval in shape, smooth, and yellowish-white in color. A single adult female can lay up to 5,000 eggs during her lifetime. After the eggs hatch the larvae drop to the ground, enter the soil and feed on plant roots. Larvae are white, legless, and have chewing mouthparts, reaching a length of around one inch (Figure 1). Adults emerge from the soil after pupating. They are black with white, red orange, and/or yellow scales on their wing covers. These scales can rub off of ridge tops, leaving the appearance of black stripes on a lighter background (Figure 2). Adult weevils vary in size from 3/8 to 3/4 inch and feed on the margins of young leaves, resulting in a notching pattern which can sometimes be confused with grasshopper or caterpillar damage.



Figure 1. *Diaprepes* root weevil larva



Figure 2. Adult *Diaprepes* root weevil

Monitoring. Adult weevils are most active from May through October or November in central Florida, typically peaking in late May to early July. A second peak in late August to mid-October has been observed at times in citrus. Adults feed on new foliage, creating a notching pattern along the leaf margin. Growers can scout for adult weevils by inspecting young foliage for this notching pattern. However, since this type of damage can also be caused by other insect pests, an additional monitoring method is placing plastic sheeting or a light-colored drop cloth under the blueberry plant and shaking the branches to dislodge the adults. This will be most effective in early morning or late afternoon.

There is no existing method for monitoring larvae in the soil. Growers can inspect the root system when a damaged plant is removed from the ground to detect whether root weevil damage is present. The soil may need to be washed from the roots to reveal any damage, which can include channeling on the roots and bark, holes in the roots, and girdling near the crown. These injuries can kill or cause serious decline in blueberry plants, and may also create an entry point for *Phytophthora*, causing a root rot infection.

Control. Existing *Diaprepes* controls have primarily been developed and used in citrus. Although there are no published field studies of these controls on southern highbush blueberry in Florida, certain citrus controls may prove effective against this pest.

Management and control of *Diaprepes* root weevil should target both the adult and larval stages. Foliar insecticide sprays to control adults include Provado, Brigade, Danitol, and Actara. Foliar sprays should be applied every 10-14 days and application should begin when 3 or more adults are found within 1-acre blocks. Larvae can also be managed with insecticides either by directly drenching the soil area beneath the plant canopy or through the irrigation system. Insecticides that target larval populations are Admire Pro, Brigade, Danitol, and Platinum. Brigade (bifenthrin) has been used in citrus to create a barrier to larvae dropping from plant foliage and entering the soil. Provado, Admire Pro, Actara and Platinum are all neonicotinoids and should not follow each other in a rotation program. Pre-harvest intervals and other labeling instructions should be closely followed. Bifenthrin is not recommended to be used as a soil drench during harvest. Also, horticultural oil has been used in citrus to separate leaves protecting *Diaprepes* eggs, making them subject to desiccation and predation.

In addition, entomopathogenic nematodes may have potential for controlling *Diaprepes* in blueberry. The *Steinernema riobrave* species (sold under the product name Nemasys R) were shown to be an effective control in citrus, targeting root weevil larvae in the soil. Since southern highbush blueberries are primarily grown in pine bark substrate (as opposed to the non-amended sandy soil in which citrus typically grows), studies are underway to screen additional nematode species for use in pine bark, and to improve nematode application to substrates using drip systems similar to those used in blueberry production.

Summary. *Diaprepes* root weevil can damage the root systems of blueberry plants, and some central Florida blueberry growers have reported the presence of adults and larvae, as well as significant root damage and plant death. Monitoring and control should be practiced by central

and south-central Florida blueberry growers, and any identification of root weevils and/or root damage consistent with root weevil larvae activity should be reported to Dr. Oscar Liburd, UF blueberry entomologist (oeliburd@ufl.edu), and Doug Phillips, UF blueberry extension coordinator (dal64372@ufl.edu).