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PIGWEED FLEA BEETLE (*Disonycha glabrata*) (Coleoptera: Chrysomelidae)

Pigweeds are serious agricultural weeds in the Amaranth family. This would lead one to believe a pigweed flea beetle would be a great biological control organism. However, there are species of amaranth used for food, both as a grain and a leafy vegetable, and as ornamentals (e.g., Love-Lies-Bleeding). In Jamaica, callaloo refers to *Amaranthus viridis*, a pigweed that is harvested prior to flowering and mainly used as a steamed green vegetable. If left to flower, the grain produced is high in lysine and when combined with other grains, provides good human nutrition. The pigweed flea beetle is becoming a problem for callaloo producers in Connecticut.

Figure 1. Pigweed flea beetle adult. Photo by Kristy Baker. Used by permission.

This native beetle is found from California to Florida in the Southern United States. In the Northern United States it is found from New York to the foothills of the Rockies.

In the Caribbean it is found on the islands of Jamaica and Trinidad. It is also found in Central and South America.

Figure 2. Damage to callaloo caused by the pigweed flea beetle. Photo by Richard Cowles.

DAMAGE

Adults feed on foliage, chewing small, round holes (Fig. 2). Larvae are also foliage feeders. Heavy feeding results in early leaf drop and therefore no crop.

HOSTS

In Connecticut this beetle was seen eating *Amaranthus viridis*, as well as the weedy pigweeds found in the hedgerows around the field. Red root, smooth, and prostrate pigweed are commonly found throughout Connecticut in agricultural settings and disturbed areas. In Virginia, this beetle was also a minor pest of beets, spinach and swiss chard.

DESCRIPTION

There is a lot of confusion between this flea beetle, the pale-striped flea beetle, the three-lined potato beetle and the striped cucumber beetle.

Adults

Shiny yellow to white and black striped adults are ¼" long and half that in width (Fig. 1). The black bands in the middle of the wing covers are wider than the yellow stripes on either side of them. The underside of the body is usually yellow. The head is yellow to red between the eyes and black where it joins the thorax. The golden yellow thorax can have one to three dark dots distally toward the wing covers. Legs are golden yellow where they join the body but darken to black out by the feet. The enlarged femur on the hind leg allows adults to "hop" like a flea, hence the common name. The elytra or wings have three black stripes and four pale yellow stripes. An important difference between the pigweed flea beetle and the pale-striped flea beetle is that all edges of the two wing covers are black in the pigweed flea beetle and yellow in the pale-striped flea beetle. The pale-striped flea beetle is quite polyphagous, feeding on plants from 25 different families. However, it will feed on pigweed which adds to the confusion.

Figure 3. Striped cucumber beetle adult. Photo © by Nathaniel Gross.

Behavior and host plants will distinguish the striped cucumber beetle and three-lined potato beetle from the pigweed flea beetle. The striped cucumber beetle has a totally black head and golden yellow pronotum (Fig. 3). There is no black margin edging the wing covers. It will not feed on pigweed and cannot jump. The three-lined potato beetle has black eyes and antennae but the head is orange to yellow (Fig. 4). The pronotum is a golden yellow with two black dots. As a larva, this insect puts its feces up onto its back. Also the adults cannot jump and will only be found eating solanaceous plants such as pepper, eggplant, tomato and potato.

Figure 4. Three-lined potato beetle adult. Photo © by Tom Murray.

Eggs
Pale yellow to orange, one mm long by .5 mm wide, cylindrical eggs are most often laid in clusters. Each end of the egg is clear.

Larvae
Grayish white larvae have rough skin with fleshy tubercles topped by a single black hair. There are three instars.

Pupae
A prepupae develops from the third instar in the soil cell made by the third instar larva. Pupae are also grayish white and just under ¼ inch long.

LIFE CYCLE
The pigweed flea beetle overwinters as adults in leaf litter on the ground. In Indiana, adults emerged from their overwintering sites in early April and were seen through early July. In Connecticut, adults have been seen in August.

At 80ºF, the yellow orange eggs hatch in about six days. They are laid at the base of the plant and in the duff. They can also be laid on the upper and lower leaf surfaces. In outbreak situations, egg clusters will be laid first on lower leaves and then progressively higher into canopy of the plant. There is evidence that egg laying stops when pigweeds begin to set flowers.

Larvae go through the three instars in around nine days at 80ºF. They feed along with adults on foliage of the pigweeds. The third instar burrows into the soil and forms a pupal chamber.

Pupae take around 13 days to mature into the adults. They are found 1 – 3 inches below the soil surface.

With a life cycle of about 28 days, it remains to be seen how many generations of this beetle we have in Connecticut. In Arkansas there are three generations per year.

MANAGEMENT

When needed, either adults or larvae can be targeted for management. Foliar sprays of spinosad, permethrin, or pyrethrin can be applied per label directions, as needed. Also labelled for this use in Connecticut are acetamiprid, azadirachtin, carbaryl, imidacloprid and kaolin.

Successful management of the first generation will lessen any possible future generations of this flea beetle.

Since many weedy pigweeds can be found around fields and along the borders, controlling them may help lower the flea beetle population that gets into the crop and damages the vegetables.

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