

Red alert

Supplement - Insect Control: red-headed flea beetle

Native flea beetles are tough pests to manage.

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Sometimes new pests come out of the blue. They could be imported from a foreign land but many times the culprit is from right here at home. Such is the case with red-headed flea beetles, *Systema frontalis*.

Red-headed flea beetles are native to the U.S. They have been lurking in and around our nurseries since the first nursery started in a young new republic. So why have they become such a serious pest of nursery stock over the past several years? The short answer is: "No one knows." Perhaps it is because we are growing larger quantities of favored host plants such as roses, hydrangeas, and *Itea*. Or maybe environmental conditions have changed enough that more of them survive the winter. Maybe all the crops they used to eat, like soybeans and corn, are defended with Bt proteins. Regardless, red-headed flea beetles became a pest so quickly, it has been hard for management recommendations to keep up. In this article, we will cover what is known about red-headed flea beetle biology and management. And just in time, too. If they are not active yet where you are, spring is coming fast.

Red-headed flea beetles are one of those pests that feed on your plants' roots *and* leaves. Thus, they can hang out in nurseries year-round. Red-headed flea beetles overwinter as eggs in potting media. I have a feeling that in warmer regions, larvae may also overwinter in pots. Larvae hatch in spring and begin feeding on roots. The larvae are elongate and creamy-white. Even though they feed on roots the larvae probably do not do much harm to plants. The larvae are small, less than 1/8 inch, and just don't eat enough to cause the type of damage that black vine weevil or scarab beetle larvae will.

Adult red-headed flea beetles are small, shiny black, beetles with reddish to dark colored heads and long antennae. If you try to get a closer look at a small black insect, and before you can see the red head it is gone, it's probably a flea beetle. As the name suggests they jump great distances when approached. There are at least two generations in the Mid-Atlantic region and probably more in the South.

Scouting

You can scout for larvae in late spring by removing plants from pots and inspecting the outside of the root ball for white larvae. Be quick. They will move into the root ball when exposed to light. Larvae hatch around 250 degree-days (base 50°F). This is around the time black locust (*Robinia pseudoacacia*) and Virginia sweetspire (*Itea virginica*) start blooming. Adults tend to become active around 600 degree-days



Red-headed flea beetle damage to hydrangea.

(base 50°F) which corresponds to when *Magnolia grandiflora* are starting to bloom. Of course, plant phenology can vary by year and region. Where I live in Raleigh, N.C., we just passed 250 degree days, but have full-grown larvae and not a locust flower (or leaf for that matter) in site. Your state climate office will have a free and easy online tool for calculating growing degree days in your town.

Photo by Matt Bertone,
North Carolina State
University



Red-headed flea beetle on a rose leaf.

An easy way to scout for adults is to beat some foliage into a white tray or clipboard to dislodge the beetles. You can also use a sweep net. Again, keep an eye out as you approach because some will jump away. Some favorite host plants of red-headed flea beetles include roses, forsythia, salvia, Joe Pye weed, azaleas and hydrangeas. These would be good species to start scouting for adults and larvae before damage occurs. Red-headed flea beetles skeletonize leaves as they feed. This means that after feeding, a network of the thicker leaf veins will remain and all the leaf tissue in between the veins will be eaten away. If you have had trouble with flea beetles last year, you are sure to have them this year. Plants that were damaged last year would be a good place to start looking for larvae because the adults likely laid eggs there.

Control measures

Pests with damaging life stages in the soil and foliage, such as black vine weevil and red-headed flea beetle, are managed most successfully when both life stages are targeted. Managing larvae is difficult because they are hard to see and not many products are labeled or effective at killing soil-dwelling larvae. However, there are some, so check with extension specialists in your region to find out what is labeled. However, it is not clear how much controlling larvae will help control adults and damage. Remember these are native beetles that feed on dozens of wild plant species, weeds, and other crops like soy beans. Even with no larvae in your pots (good luck), beetles lurking around the area could find your plants. This is an area where further research would be valuable.

Adult management has been frustrating for growers who find that even frequent insecticide applications do not reduce adult abundance and damage to acceptable levels. Part of this probably has to do with larvae since, even if you kill all the adults present (which you won't), more adults are emerging from the pots every day. However, it also related to beetles probably recolonizing plants from other parts of the nursery or adjacent crops or natural areas. In addition, it seems red-headed flea beetles are remarkably tolerant of insecticide residue. In our research, even relatively effective insecticides we have tested, such as dinotefuran, acephate, and some pyrethroids, which killed almost 100 percent of beetles the first day after application, killed very few beetles just one week later.

Research funded by the USDA IR-4 program and many state nursery associations is being conducted by university faculty and extension personnel around the country. The pay-off from this federal, state, and private investment should be new knowledge about beetle movement into nurseries, the most susceptible and resistant plant species and cultivars, and biological control agents, such as entomopathogenic nematodes, that show promise for managing larvae. Of course, insecticide efficacy research is happening too, but red-headed flea beetles have made it clear that it will take a more integrated approach to keep their damage in check.

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Red-headed flea beetle larvae.
Photo by SD Frank, North Carolina State University

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