



Managing Red-Headed Flea Beetles

Few insect pests have caused as much damage in nurseries over the past 10 years as the red-headed flea beetle (*Systema frontalis*). RHFB adults feed on a wide variety of broadleaf ornamental plants, skeletonizing leaves and ultimately leaving plants aesthetically unsaleable. Growers report the heaviest damage on key nursery crops such as *Itea virginica*, *Hydrangea paniculata*, *Weigela florida*, *Ilex spp.*, and *Rhododendron spp.* (azaleas). Initial attempts to control adults have resulted in limited success and failed to keep damage below economic thresholds. To successfully control RHFB, it is necessary to target vulnerable life stages and dial in application timing based on growing degree days.



Figure 1. Red-headed flea beetle adult. Photo credit: Brian Kunkle, University of Delaware, bugwood.org

RHFB Life Cycle

RHFB overwinters as eggs in nursery containers, emerging the following spring to infest the next year’s crops. Depending on a grower’s location, they may experience anywhere from 1-4 generations per year. The easiest time to control RHFB is prior to the emergence of the first generation. As the second generation of adults emerge, generations overlap, complicating control efforts.

Growing degree days (GDD) are helpful for tracking environmental conditions conducive to insect development. To calculate GDD, take the average daily temperature and subtract the base temperature (typically 50°F). The remaining number is the number of GDDs accumulated that day. If you get a negative number, count it as zero; you can only accumulate positive GDDs.

How to Calculate Growing Degree Days
GDD = (Min Temp + Max Temp)/2 – Base Temp

Example:
(48°F + 72°F)/2 - 50°F = 10 GDD

Building a Chemical Control Program for RHFB

Cultural best practices, such as separating new crops from old, infested crops, will help to reduce pest pressure. Frequent scouting, including plant root balls to detect larvae, provides important information about the pest life stage and current population level. This information will allow a grower to choose control methods tailored to their operation and environmental conditions. There is on-going research into biological control options, especially for control of the larval life stage, which are showing promise. However, to keep adult feeding damage below an economic threshold, insecticides are an essential management tool.

Product selection, timing, and application method are key considerations for growers. Growers may use a combination of methods depending on the crop and other limiting factors, such as labor availability and cost. For example, a grower may choose to drench the remaining overwintered plants on property and incorporate a granular insecticide for new potting. Or a grower may rank their crops by economic importance or susceptibility to damage and prioritize more labor-intensive treatments accordingly. The table below offers a summary of treatment options.

Example Red-Headed Flea Beetle Program

Life Stage	Approximate Growing Degree Days (base 50)	Application Method	IRAC #	Active Ingredient	Atticus Brand	Comments
Prior to 1st Generation Egg Hatch	250	Drench	4A	imidacloprid <i>or</i>	Mineiro™ 2 F Flex	Focus on overwintered plants that were damaged the prior year. Granular neonics may be topdressed or incorporated.
		Drench	28	chlorantraniliprole	-----	
1st Generation Larvae Emergence	250-500	Drench	UN	azadirachtin <i>or</i>	Atrevia™ 3.0% SL	If unable to treat prior to egg hatch, consider a drench with a contact insecticide.
		Drench	1B	acephate	-----	
1st Generation Adult Emergence	500-1000	Foliar	4A	acetamiprid	Quasar™ 8.5 SL	Rotate contact foliar applications as needed to control adult populations. If you were not able to drench earlier, expect to make 1-2 applications weekly.
		Foliar	1A	carbaryl	-----	
		Foliar	4C + 5	sulfoxaflor + spinetoram	-----	
		Foliar	3A	bifenthrin	Batallion™ 2 EC (RUP)*	
		Foliar	UN	azadirachtin	Atrevia 3.0% SL	
2nd Generation Larvae Emergence	1500-1800	Drench	4A	imidacloprid <i>or</i>	Mineiro 2 F Flex	This application is critical for controlling adults that will emerge and feed on plants intended for fall sales (e.g., <i>Hydrangea paniculata</i>)
		Drench	1B	acephate	-----	
2nd Generation Adult Emergence	1800+	Foliar	4A	acetamiprid	Quasar 8.5 SL	Continue to rotate foliar applications until adult activity stops in fall.
		Foliar	1A	carbaryl	-----	
		Foliar	4C + 5	sulfoxaflor + spinetoram	-----	
		Foliar	3A	bifenthrin	Batallion 2 EC	
		Foliar	UN	azadirachtin	Atrevia 3.0% SL	

*Batallion 2 EC is a restricted use pesticide