Japanese Beetle Control

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Vera Krischik has studied the Japanese beetle, Popillia japonica, her entire professional life and found that an “ecosystem management” approach not only works better in the diminishment of the pest, but is also easier on the environment.

The pest first showed up in the U.S. in New Jersey in 1916, says Krischik, an extension specialist and associate professor in the entomology department at the University of Minnesota. By the ’50s and ’60s, it had infestation levels in the Northeast and was headed west. It currently is not found in the western states of Arizona, California, Colorado, Idaho, Montana, Nevada, Oregon and Washington, where quarantines prevent its arrival in nursery stock, but it is threatening.

“They lay a lot of eggs and they live for a long time,” Krischik says of the adult female beetles, which have metallic green heads and metallic brown wings. They emerge in the spring, as late as July depending on the climate, and eat a lot of shrubbery and tree leaves before laying their eggs primarily in irrigated turfgrass. Ideal conditions are grassy areas on moist soils rich in organic matter. As soon as they emerge, the adult females begin digging in the soil and laying eggs.

Females can lay eggs many times over a period of six weeks or longer,
returning to nearby woody plants to feed. The larvae or grubs, the most damaging stage to grasses, feed all summer, overwinter and emerge even larger the next spring to feed and produce male and female adults. These white, C-shaped grubs may be one of several larvae of similar appearance doing damage to turf.

Early detection is crucial. Female Japanese beetle feeding on nearby foliage, sometimes in large numbers, are an indicator that grass roots are also being consumed by grubs. Another clue is birds on the ground feeding on grubs, Krischik says. Pheromone traps serve as indicators, and she recommends they be placed away from prime turfgrass and horticultural areas to avoid attracting more damage to the plants. Another method of scouting is to dig up sections of turf near dying grass, peel it back and see if the white or creamy grubs are present. Japanese beetle grubs are the ones with white bristles on the last abdominal segment, and there will be noticeable turfgrass root damage.

“If you have a problem, you probably should use insecticides right away,” she says, though the seriousness of the infestation could be lessened by other measures. The first thing to do is make sure the brown, dying grass is not the result of one of many pathogens.

The insecticide that Krischik suggests is a new one, chlorantraniliprole (Acelepryn), a contact treatment that comes in a suspension concentrate and is applied when female Japanese beetles first show up in the spring. It can be used on ornamentals and turfgrass, and can be reapplied from April to September, with care to stay under the total labeled rate. Krischik likes that it is a “reduced risk” insecticide that is easy on beneficial insect species and humans.

Other tried-and-true insecticides include imidacloprid (Merit), as a granule or flowable, applied from emergence of adult females up to a couple of weeks later. This is a systemic that is applied to grass and other plants, one treatment sufficing for the season. Turf managers usually apply it only to the areas where Japanese beetles are found feeding.

Another standby is halofenozide (Mach 2), an insect growth regulator for treatment of larva. She says the granular or soluble concentrate is fairly environmentally safe, and can be used in two or more applications if
necessary. It should be applied at first gathering of adult females, or shortly thereafter. It also is deleterelatively safe for humans and pets.

One older chemical, trichlorfon (Dylox), is often used as a “rescue” treatment late in the summer if many grubs are detected and are doing a lot of damage to turfgrass. Best used right after irrigation, it is a wider-spectrum insecticide. Other standbys, such as the pyrethroids and bifenthrin (Talstar), have some effectiveness, but are not as efficacious as the above-mentioned treatments. “It’s more difficult for them to penetrate through the blades of grass down to the roots.”

Among the best controls to keep Japanese beetles in check is the use of good cultural practices in and around turf facilities. Krischik emphasizes that long-term landscape management is important, including the use of shrubs and trees that are less attractive to the pest. Japanese beetle adults love species such as grapevines and linden trees, but dislike others, such as boxwood and flowering dogwood. Following these planting guidelines and encouraging neighboring landscapers to do the same can gradually reduce the need for other treatments. Keeping grass healthy, but not lush, is also helpful.

A biological treatment that has proven effective is the use of native nematodes, which attack the larvae underground. Krischik notes that the Japanese beetle larvae are the most susceptible of grubs to nematode controls, and there are a couple of nematode species commercially available, with more in development. Heterorhabditis and Steinernema nematodes have proven effective, particularly in wet turf.

Albert Pye, owner of BioLogic, a producer of Steinernema and Heterorhabditis nematodes in Pennsylvania, says the former comes in three formulations and can be used at soil temperatures from 50 to 85 degrees and can be active for up to two summers and a winter. Called SCANMASK, the product is most effective when the lawn is watered before and after application, he says. “You can use it with injector sprayers or pressure sprayers,” Pye says. Cost may be a little higher, but Steinernema will also kill other damaging grub species at the same time.

Krischik advises applying nematode formulations with nightly irrigation. They don’t tolerate high temperatures. They can be purchased from biological supply firms or insectaries such as BioLogic, Rincon-Vitova or Green Methods. There is also a Sticoraspora protozoan, which has been effective in grub control in university trials, but it is currently only available on a research basis.

The introduced parasitic spring Tiphia wasp should be considered as part of an overall management program, Krischik says, along with the imported Istocheta fly. The former lays its eggs on the grubs, and the latter lays its eggs on the adult Japanese beetles. Both provide a slow kill, but are susceptible to insecticides and should be considered part of a long-term solution as populations of beneficial insects build. Turf managers interested in using one of these parasites need to contact their state department of
agriculture to find a source.

One method that has been tried over the years and gained some traction in the literature is the milky spore bacterial disease, but Krischik downplays this method. “Everybody wants it to work,” she says, but the spore cultures, though readily available commercially, are now considered weakened and she doesn’t recommend them.

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