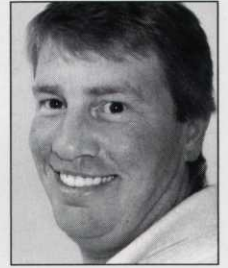




MDA Now Considers Japanese Beetle Established in Minnesota



By PAUL DIEGNAU, CGCS

Keller Golf Course

A funny thing happened at my golf course last year. The occasional adult Japanese beetle (*Popillia japonica*) we would see on a green or in a garden suddenly blossomed into numbers we were uncomfortable with. The no-mow buffer strips around our water features had become gathering points for the consumption of wild aster and reproductive orgies. We placed pheromone traps in areas of concentrated activity and were amazed at the numbers collected. For close to two weeks, the traps were full in one or two days and had to be emptied. I grabbed a pair of binoculars and started searching the tops of our lindens and maples. Sure



enough, the metallic, coppery green critters could be seen skeletonizing leaves in their feeding frenzy. I could only wonder what 2005 would bring.

Well, 2005 is here. The Minnesota Department of Agriculture has determined that JB is established in Minnesota and has dropped its trapping and monitoring program for this species. What kind of ride are we in for, both short and long term? Is it time to start scouting and monitoring for larvae? How will this beetle affect our maintenance budgets and our playing conditions? I put these questions to several local superintendents with JB experience and out into cyberspace on the "Turfnet" forum. I

received responses from Michigan, Iowa, Toronto, Massachusetts, Virginia, Minnesota, and Wisconsin. The information I received was very informative, insightful, and even somewhat alarming. This information is being offered in the hope that proactive golf course managers will be better prepared to deal with JB as the need arises.

The adult beetle has an iridescent green color to its body with copper-colored wing covers. They are easily identified by the six white tufts of hair located on each side of their body. The adult beetle has a voracious appetite, feeding on over 300 species of plant material. Their favorite meal is a sampling of Lindens, Norway maple, members of the rose family and grape vines. They feed between the veins in a leaf, leaving a skeleton behind.

When populations are sizable, they can defoliate an entire tree in a short period of time. One golf course superintendent from Michigan shared a story of being able to hear the buzz of the beetles feeding in the trees above...over the noise of a golf cart engine!

Most JB veterans will tell you to avoid using traps if adults are not visible. The pheromones and scents in these traps can lure beetles onto your property from a mile or more away.

Once you have identified adult populations on your property, a month of trapping in July will give you some perspective on the quantity of JB you are dealing with. Trapping for more than a year may



lead to problems, such as those experienced by David Longville, CGCS, who is currently the head superintendent at Mill Run/Wild Ridge Golf Courses in Eau Claire, Wisconsin. While previously serving as superintendent at Hillcrest Golf and Country Club in Eau Claire, Wisconsin,

David managed to collect eleven 55-gallon trash bags full of Japanese beetles! The sheer volume of such a catch led to disposal issues. He attempted to freeze them in a freezer but they generated too much heat and would not freeze. His only recourse was to burn them in a 55-gallon barrel. Needless to say, mass trapping is problematic and not an effective control method.

Opinions and situations vary as to whether adult beetles need to be



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controlled or not. Obviously, if you have softball-size balls of horny beetles rolling across your greens, tees and fairways, a treatment may be warranted or even demanded by your golfers. Products containing active ingredients such as acephate, trichlorfon, carbaryl and several pyrethroids will provide quick knock-down of adult JB in trees and on turf and ornamentals.

The female Japanese beetle prefers to lay her eggs in moist, loamy soil covered by turfgrass or mulch. She prefers grass that is 2" in height and lower. During her 30-45 day lifespan, she can lay as many as 60 eggs, beginning in late June. In two to three weeks the eggs hatch and the larvae immediately begin feeding on turfgrass roots. The white grubs attain a full-grown length of approximately one inch and are identified by the v-shaped rastral pattern located near their anal slit.

Locations of infestations tended to vary from course to course, but most agreed that unirrigated rough areas adjacent to



watered fairways are the first areas to show damage due to drought stress. The JB veterans who shared their experiences with me indicated that lush fairways are prime areas along with southern exposed green, tee and bunker surrounds. Healthy, irrigated turfgrass is, of course, more resilient and usually able to outgrow the root damage inflicted by the grubs so scouting and monitoring is a must. One thing is for certain. (Insert photo of turf

damage) When the raccoons, skunks and opossum find these buried delicacies, all hell can break loose! A family of raccoons can destroy acres of turfgrass in a short period of time. According to most of my contacts, the damage inflicted by these vertebrate pests is the most serious and

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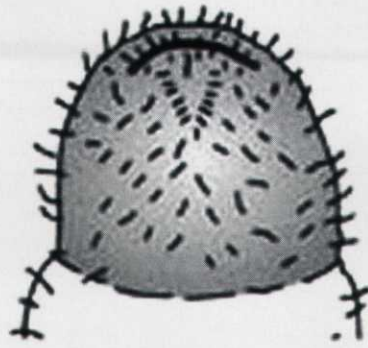
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difficult to control; more so than weakened turfgrass or tree and ornamental damage. Another interesting fact that will save you money – the female Japanese Beetle avoids laying eggs in tight mowed, dense surfaces such as putting greens. So don't bother spraying these surfaces.

How does one avoid such a scenario?

There are several preventative pesticide products on the market that are very effective on JB larvae. Imidaclopid (Merit) and Halofenozide (Mach 2) are the current products of choice. Halofenozide is an insect growth regulator that essentially "grows the grubs to death." It is a slow-acting product that should be sprayed when adults are active and beginning to lay eggs, usually in June through early August. Imidaclopid is also a slow-acting systemic product that is absorbed and translocated in plants. The adult and larval stages feed on root and leaf material and ingest the poison. This product should be applied anytime between May 15 and August 15. When applied as a drench below the drip line of host specific trees, Imidaclopid will provide excellent



Japanese beetle

control of adult beetles.

Both compounds exhibit low toxicity on birds and fish and are extremely effective on first instar larvae. Base your treatment decisions on previous history of grub infestations. Plan on spending approximately \$110 / acre for either of these products, and they must be watered in to be effective.

If you are caught by surprise and discover grub infestations in late summer or

stabilize population numbers.

On the horizon there are several very promising bio-control options being studied and tested. *Tiphia vernalis* (parasitic wasp) hunts down the larvae of the Japanese beetle and deposits eggs that hatch and kill the grub. The *Tiphia* wasp cannot eradicate Japanese beetle. It can keep beetle populations low enough to minimize plant damage and can be used as part of an overall Integrated Pest Management program to suppress populations. USDA researchers consider it to be the most effective parasitoid of JB in the U.S.

The Winsome fly, *Istocheta aldrichi*, parasitizes the adult female Japanese beetle by laying eggs on her thorax. The eggs hatch and the maggots bore into her body, killing her quickly. In ideal situations, this fly can suppress JB populations before the beetles can reproduce.

Several parasitic nematodes show promise as components in an IPM program. *Steinernema glaseri* and *Heterorhabditis bacteriophora* nematodes are particularly effective at finding and destroying JB grubs. *S. glaseri* tracks the

"If you are caught by surprise and discover grub infestations in late summer or the fall of the year, Trichlorfon (Dylox) will provide an effective rescue treatment."




the fall of the year, Trichlorfon (Dylox) will provide an effective rescue treatment. This contact insecticide is very fast-acting and effective on first and second instar larvae. Be aware that this product is subject to alkaline hydrolysis, so pH adjustment in the spray tank is critical to attain maximum effectiveness.

Many who shared information felt that JB populations were somewhat cyclical in the sense that adult populations tended to fluctuate from year to year. The amount of acreage treated on an annual basis varied from golf course to golf course. Some superintendents treat well to wall every year. Others minimize their treated acreage by scouting populations and treating hot spots as needed. There was also a consensus that the initial outbreak / onslaught will last nine to ten years before predator-prey relationships

grub in the soil by following the insects' carbon dioxide trail released through their breathing vents. Research continues on the efficacy of both parasitic nematodes and insects in field applications.

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(Editor's Note: Paul Diegnau, CGCS, is the MGCSA liaison to the Minnesota Invasive Species Advisory Committee. MISAC is co-chaired by the MN Dept. of Agriculture and the MN Dept. of Natural Resources. The council was formed in response to Presidential Executive Order 13112 on invasive species, the National Invasive Species Management Plan and Minnesota legislation that encouraged the state to plan and take action on invasive species.)




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