



# Y2K Grub Control: Are You Compliant?

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## ***They're here and their populations are growing***

Japanese beetle infestations are on the rise in Wisconsin, especially in Rock, Walworth, Racine, and Eau Claire Counties. Adult trap counts in July and August and grub infestations in late August and September indicate their increasing population. Consequently, it's merely a matter of time before their anticipated distribution throughout Wisconsin.

Japanese beetles are one of the most important and destructive pests of turfgrass and ornamental plants. Unlike most other insects, both the larvae (i.e., grubs) and

adults can cause damage.

Adult Japanese beetles feed on the foliage of over 300 identified species of ornamental plants. Feeding damage caused by adult beetles results in the skeletonization (i.e. feeding between the veins of leaves) leaving only a lace-like appearance of the leaves. This damage often results in leaves turning brown, dying, and eventually falling-off.

As for the damage caused by Japanese beetle grubs, they are below-ground feeders that feed on the roots, rhizomes, and stolens of turfgrass. Grubs can destroy the entire root system of a plant,

resulting in the loss of turf. Where grub populations are high enough (i.e., 15-30 grubs/ft<sup>2</sup>), the first evidence of injury is localized patches of pale, discolored and dying turf that displays symptoms of drought stress. These areas rapidly enlarge and coalesce as the grubs continue to feed, grow, and expand their feeding range. Such areas can be easily lifted or rolled much like carpet.

To make matters even worse, raccoons, skunks, and other animals are attracted to grub infested areas, and their foraging behavior often results in more damage than the grubs. As if this were not

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enough, several species of birds also exploit grub infestations, causing even more turf damage.

**Prevention of Adult Japanese Beetle Feeding Damage**

One of the simplest ways to prevent feeding damage by Japanese beetle adults is to eliminate all preferred hosts; however this is obviously not practical since it is not justifiable to remove a healthy, desirable tree. Thus, the next best line of defense is to treat susceptible trees.

There are two primary options for controlling Japanese beetle adults on preferred trees; preventative or curative treatments. Currently, there is only one treatment option for preventative control of Japanese beetle adults. Merit® (imidacloprid) is the only product labeled for preventative control. However, Novartis has an experimental product that may be labeled in the near future. Susceptible plant material **must** be treated 7-9 months prior (i.e., September/October) to Japanese beetle presence (i.e., late-June/July). The recommended rate of application is 1.9 grams (0.067 ounces) of Merit® 75 WP per one inch diameter at breast height (DBH). This is obviously a very small amount of product, thus a scale or balance that measures in grams would be needed. For example, a six inch DBH linden tree would require 11.4 grams (0.4 ounces) of Merit® 75 WP.

There are two methods to apply Merit® preventatively to trees; soil drench or soil injection. Soil drench is nothing more than the uniform application of a control product and an appropriate amount of water. The manufacturer (i.e., Bayer) recommends that a minimum of 10 gallons of water per 1000 ft<sup>2</sup> be applied as a drench around the base of the tree, directed to the root zone. As for the soil injection method, a mix of the control agent and sufficient amount of

water is injected using an injection probe in a grid pattern on 2.5 foot centers, extending from the drip line of the tree.

As for curative control of Japanese beetle adults, there are several products labeled for their control. Below is a table containing trade names, common names, manufacturer, and rates for some of the control products.

Curative control requires a foliar application to the leaf surface, especially the upper leaf surface. The optimal time to treat Japanese beetle adults is at the onset or first observance of beetle flight (i.e., late-June/July). Depending on the control product selected, repeat applications may be necessary.

Trade Name	Common Name	Manufacturer	Rate
Orthene	Acephate	Valent USA	21.3 oz./100 gallons H2O
Talstar	Bifenthrin	FMC	2.0-4.0 oz./10 gallons H2O
Turcam	Bendiocarb	AgrEvo	6 oz./100 gallons H2O
Sevin	Carbaryl	Rhone-Poulenc	1 qt./100 gallons H2O
Dursban Pro	Chlorpyrifos	Dow AgroSciences	4 gallons/100 gallons H2O
Tempo	Cyfluthrin	Bayer	1.9 oz./100 gallons H2O
DeltaGurad	Deltamethrin	AgrEvo	4-8 fl.oz./100 gallons H2O
Scimitar	Lambda-cyhalothrin	Zeneca	1.5-5.0 fl.oz./100 gallons H2O

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**White Grub Control Strategies**

Golf course superintendents and turfgrass managers have two options for control of Japanese beetle grubs; they include preventative and curative control. Highly maintained turf is especially susceptible to Japanese beetle grub infestations for several reasons. Intensively managed turf is typically mowed at relatively low cutting heights and fertilized and irrigated regularly. All these cultural practices present a conducive environment for Japanese beetle development and survival. As a result, Japanese beetle adults "seek-out" or exploit such areas to increase their probability of survival. In addition, during periods when rainfall is often limited (i.e., late-July and August), quality turf is typically irrigated which helps ensure survival of grubs. Unfortunately, necessary management practices implemented to maintain quality turf are ideal for Japanese beetles. Thus, control measures must be undertaken in order to minimize potential damage as a result of grubs feeding on the roots of turf.

Preventative Control

Preventative control of grubs is simply the application of a control product before any eggs have been laid. Some preventative products must be applied at or before egg hatch to attain maximum control. Currently there are two preventative grub control products that are labeled for Japanese beetles as well as other white grub species; they include Mach 2 (halofenozide) and Merit (imidacloprid). Both of these products are available in liquid, granular, and fertilizer combination formulations.

Due the impact of the FQPA (Food Quality Protection Act of 1196), Oftanol (isophenfos) is no longer registered for grub control; Bayer has elected to no longer manufacture this product.

Trade Name	Common Name	Manufacturer	Rate
Merit 75 WP	Imidacloprid	Bayer	0.4 lbs./Acre
Mach 2 2SC	Halofenozide	RhoMid	3 qts./Acre

**Table A**

Trade Name	Common Name	Manufacturer	Rate
Turcam	Bendiocarb	AgrEvo	45-65 oz./Acre
Sevin	Carbaryl	Rhone-Poulenc	10 lbs./Acre
Dursban	Chlorpyrifos	Dow AgroSciences	4-8 qts./Acre
Mach 2	Halofenozide	RhoMid	3 qts./Acre
Dylox	Trichlorfon	Bayer	10 lbs/Acre

**Table B**


Regardless of the product, formulation, or the label "language," **all grub control products must be watered-in** with a minimum of 1/2 inch of water to maximize efficacy by distributing the compound where the target pest is located. See **Table A** which contains trade names, common names, manufacturer, and rates for preventative grub control products.

Curative Control

Curative or corrective control of grubs is nothing more than treating grubs once they have been detected. This approach to grub control may appear to be more economical initially, however, control options for curative control of grubs are quite limited. This is a result of the large variability of control exhibited by the available control products. Although there are several products labeled for curative control, based on findings from research studies, there are only two or three products that provide acceptable (i.e., >80%) control. These products include Turcam (bendiocarb), Sevin (carbaryl), and Dylox (trichlorfon). All other product only provide marginal control (i.e., 25-50%). See **Table B** which contains trade

names, common names, manufacturer, and rates for curative grub control products.

Like the preventative control products, regardless of the product, formulation, or the label "language," **all grub control products must be watered-in** with a minimum of 1/2 inch of water to maximize efficacy by distributing the compound where the target pest is located. ♣



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