

How to choose and when to apply turf grub control products

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It is late for preventative treatments for grub control in the Central Great Plains but damage being seen now will respond to curative treatments. Amended below is an excellent summary from David Smitley, Terry Davis and Erica Hotchkiss, Michigan State University, Department of Entomology and select material from Sarah Browning, Extension Educator, Lancaster County, NE.

White Grub damage to a turf

The term "white grub" encompasses the larval stage of several scarab beetles, the most common, and most damaging, being the June beetle or masked chafer, and the Japanese beetle. Both have an annual life cycle. Less well-known are the May/June beetle, and green June beetle with a 3 year life cycle. All have a white grub larval stage that can cause damage to turfgrass. The grubs are off white, with six legs located just behind their reddish-brown head, and are usually found curled into a "C" shape in the soil.

Skunks and raccoons will dig and turn over patches of turfgrass heavily infested with grubs to find a favorite meal. This is often the first symptom of grubs that people see. The grubs consumed most of the root system, making the turf susceptible to drought damage and easy to dislodge.

Be sure the problem is grubs. If you see a dead patch, use a shovel to dig up a few Frisbee-size samples of turf around the bare spot to a depth of 2 inches and look for 0.75-inch long, C-shaped white grubs. These are most likely the larvae of European chafers if they are found in turfs without an irrigation system. European chafers can devastate a turf with little warning because the adult beetles fly at dusk when they emerge in June and early July and can easily be overlooked because their evening flight to mate and lay eggs occurs after sunset. European chafers are generally found in drier turf and their population levels will fluctuate depending upon how wet or dry the weather was the previous summer.

European chafers are a much bigger problem than they used to be. In 2002, European chafers were found in New York, Pennsylvania, Massachusetts, Delaware, New Jersey, Connecticut, New Hampshire, Vermont, Maryland, Southern Michigan, and eastern Ohio.



The species L to R are: Japanese beetle, European chafer and June bug. David Cappaert, Michigan State University, Bugwood.org

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Now it has spread throughout Ohio, northern Indiana and into eastern Illinois. It was also reported in Wisconsin in 2013. In Canada, it is a problem in Ontario and Vancouver, so Washington State is on the lookout for it also.

Japanese beetle grubs also feed on turf roots, but they are not usually as much of a problem on home turfs as European chafers can be. Japanese beetles and European chafers lay most of their eggs in July, but Japanese beetles continue laying eggs into August. Japanese beetles like to lay their eggs on irrigated turf like golf courses, athletic fields, and highly maintained turfs. They can be abundant in non-irrigated home turfs receiving frequent rain in July but are scarce in turfs that are very dry in July and early August. Japanese beetles continue to spread northward. Wisconsin, Minnesota, Nebraska and Iowa have now joined the club of Midwest states with lots of Japanese beetles, and they have been found in isolated locations as far west as Colorado.

The eggs of both species hatch about 10 days. The grubs feed from the late June/early August until late October. By the end of October, they are fully grown. The larvae of both species look almost identical. They spend the winter as large grubs (0.75 inches long) some 2-6 inches below the soil surface. When the ground warms up in spring, they resume feeding and can cause damage from the time the grass turns green until they pupate in mid-May. Grub damage may appear in turf from August/September to November or from March to early May. However, for low-maintenance turfs, even if the turf is not killed from grub feeding, the thinned and weakened turf may be prone to weeds and drought stress.

Healthy turf with a few grubs may not need an insecticide. It is important to realize that healthy turf, supported by frequent rain or irrigation, can support a grub population of five or more grubs per square foot with no visible turf damage. Tall fescue rarely shows grub damage while Kentucky bluegrass, with a reduced root system is less tolerant. However, if the grub population is high or if there is a history of damage in an area, it may be necessary to consider using an insecticide for grub control. Finding one or two grubs does not indicate you need to apply a grub control product.

Check for the active ingredient in a grub product. There are many products available, some with the same active ingredients. The active ingredients are usually shown on the bottom right or left of the front of the bag and listed as a percent of product.

Water the turf immediately after applying the insecticide with at least a half-inch of irrigation or rain immediately after the chemical is applied. Research tests over the last 25 years have clearly shown that watering immediately after application helps to obtain good results. This also moves the chemical off the grass and will make the yard safe for humans, pets and wildlife after the turf is dry.

Use the right rate/amount of product. Refer to the label.

1) PREVENTIVE insecticides that will prevent grub damage next fall and following spring

These products are used to prevent future grub problems, not to control the grubs present in the turf in the spring. They will not work on grubs found in the turf from the middle of October through the middle

of May. However, when applied in June or July they provide excellent protection against the next generation of grubs. You need to apply the preventive insecticide BEFORE the grubs are there, how do you know if you need to use an insecticide or not? If you confirmed grub damage the previous fall or spring, then you may want to use a preventive insecticide for one or two years to build a denser turf that will be more tolerant of grubs.

Preventive products are the most effective. Products containing imidacloprid, thiamethoxam, clothianidin or chlorantraniliprole are preventive products that work very well on newly hatched grubs present in July, but do not work well for large grubs found from September to May. There are different recommended timings for application depending on the active ingredient. Although the bag often says apply anytime from May to Aug. 15, it is recommended that products containing imidacloprid, thiamethoxam, clothianidin be applied and irrigated into the soil in June or July. If applied in early spring, the pesticide may move through the soil or partially degrade by the time the grubs hatch in late July. If applied too late, preventative products may not be effective.

Preventive products containing imidacloprid, thiamethoxam or clothianidin will consistently reduce 75-100% of the grubs if they are applied in June or July and if they are watered-in with 0.5 inches of irrigation immediately after application.

There is another active ingredient in some insecticides called chlorantraniliprole that will also work in preventing grub problems, but it is less water soluble than the other preventive compounds mentioned above, so it can be applied any time after the grass turns green in the spring. Chlorantraniliprole can be applied as early as April and up to mid-July. This chemical consistently reduced grub numbers by about 65-80% and research has shown that applications made before June are more efficacious than June or July application.

Protecting bees and other pollinators. If you are applying a product containing clothianidin, thiamethoxam or imidacloprid, the turf should be mowed prior to the application so that no weeds are flowering in the turf when the insecticide is applied. These active ingredients can be toxic to bees if the bees visit flowers that were recently sprayed. Mowing prior to making the application will avoid this problem by removing the flowers. Weeds that flower again after mowing are much safer than weed flowers that were sprayed directly with insecticide, but some of the insecticide is absorbed by the roots and will move into the pollen and nectar. More research is needed on this, but it could cause problems for native bees or have long-term health effects on honeybees or bumble bees. If flowering in the turf is reduced by mowing, there is less opportunity for off target injury to pollinators.

In addition, grub control products that contain the active ingredient chlorantraniliprole are safe for bees, even when weed flowers are sprayed. Finally, avoid spray drift or granular spreader drift to flower beds when applying thiamethoxam, imidacloprid, clothianidin or any insecticide for grubs other than chlorantraniliprole

2) CURATIVE insecticides

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There are two chemicals, carbaryl and trichlorfon, that are considered curative treatments. They are short-lived compounds that kill all life stages of grubs. These two insecticides are the only options if high numbers of grubs are found in the fall and in spring before early May. They are not as effective as the preventive compounds in reducing grub numbers.

Consider carefully whether it would be best to wait and apply a preventive later. If the need should arise to use a curative compound, make sure to keep the infested turf watered and fertilized and treat the area again with a preventive application the next summer or the problem will reoccur in the fall or the following spring. Current research also shows that watering with 0.5 inches of irrigation immediately after the application is essential to get effective results from these insecticides.

Our research has indicated that carbaryl has been a little more effective on European chafer grubs than trichlorfon. Both compounds work equally well on Japanese beetle grubs. It will take 10-14 days for the grubs to begin dying after the insecticide is applied. Do not apply any curative compounds in the spring after May 15 as grubs stop feeding in late May as they prepare to pupate. As with the preventive products, turfs should be mowed immediately before applying carbaryl or trichlorfon to protect pollinators.

3) Insecticides that DO NOT work on grubs

Do not use products containing ONLY lambda-cyhalothrin, gamma-cyhalothrin, bifenthrin, deltamethrin, cyfluthrin or permethrin for grub control. Products containing only these ingredients will not work for because the active ingredient binds with organic material and will not move down to where the grubs are feeding.

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