



## Beetlemania

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### Introduction

You'll have to set your 'wayback machine' to the 1960s to remember the original "Beatlemania" when John, Paul, Ringo, and George swarmed all across the United States during the British invasion. However, in our lawns and landscapes in the mid-Atlantic "beetlemania" occurs pretty much every summer on cool-season turfgrasses, and in some cases, your garden and landscape plants. Let's discuss how to properly manage this serious pest of both the lawn and the landscape.

### Grubs and adults have different feeding habits

There are a large number of beetles of varying sizes that we find in our lawns, gardens, and landscapes each summer in the mid-Atlantic. While fortunately, most of these beetles are not interested in feeding on your plants, their larval stages (the grub, Figure 1) feed on turfgrass root systems, and they can cause significant damage on cool-season grasses by their feeding on the roots during the hottest times of summer (most warm season grasses can produce enough root system to overcome the feeding activity of the grub). And one of the most prominent beetles we have each summer, the Japanese beetle (Figure 2), is a voracious feeder on the foliage of many ornamental and garden plants. This pest can warrant insecticide treatment as it can skeletonize leaves of trees, ornamentals, vegetables etc.

If you are targeting beetles because of damage to ornamental and garden plants, please refer to specific recommendations in the VCE's Pest Management Guide where you can always find the most current publication online. For this report, we are going to focus on management of the grubs that reside in the soil and feed on the root systems of the turfgrasses.



Figure 1. The white grub (larval stage) of beetles comes in a variety of sizes and they can become serious pests of turfgrasses by feeding on their root systems.



Figure 2. The Japanese Beetle feeds on the leaves of many ornamental and garden plants.

### Is treatment necessary?

That is something only YOU or your lawn care professional can decide. It is normal to get several

calls about grubs early in the year when folks first start digging and stirring the soil in their gardens and ornamental beds and they expose quite large grubs during the soil disruption. This is to be expected and in many ways is probably a sign of a somewhat healthy soil that they are present. Most of our problematic white grubs have annual life cycles where they overwinter as grubs below the freeze line in the soil, and as soil temperatures warm they begin to migrate towards the soil surface and they feed on turfgrass roots as they develop and prepare for final transformation to adults. White grubs rarely cause noticeable damage to even cool season grasses during the spring because of the mild temperatures and the rapid growth rate of the turfgrasses that allows for sufficient root recovery of the plant from insect feeding. The grubs emerge as adults, mate, and lay eggs in mid-late summer and it is during this phase that damage to the lawn is most likely. As seen in Figure 3 from a Kentucky bluegrass lawn in Blacksburg in late August, the turf begins to thin, and there are all kinds of possibilities about what this could be: disease, insect, environmental stress? If it is a disease you almost always will see some kind of a symptom (spots or lesions on the leaves) or signs (the physical presence of the disease such as the web-like mycelia that you see in the dew). And in this case while you still don't know that this is insect related, it turns out it is environmental stress that is causing the problem – the turf is dying due to a lack of moisture because its roots have been eaten by the grubs and it is not receiving adequate rainfall or irrigation to overcome this limitation.



Figure 3. Patchy, drought stressed turf that easily detaches from the soil due to a lack of roots is a strong indicator of significant grub feeding damage.

## How can you confirm grub damage?

Mother Nature provides numerous clues that suggests the presence of grubs. If your turf has had (or currently has) patchy, dying spots that can easily be pulled from the soil just like lifting the edge of a throw rug off your floor, this strongly suggests grub damage because of the lack of a root system (Figure 3). The only way to confirm grubs is to sample the soil in the area with a shovel or spade and see if you can find grubs just below the turf/soil interface, where they will be feeding after they hatch and begin to develop. Realize that in early summer (June) they might be still fairly small in size and difficult to see, but if you do find them when doing your scouting, a standard threshold suggesting treatment is warranted for 6 or more white grubs per square foot. Another sign of heavy grub pressure is turf damage due to birds, raccoons, or skunks digging into the turf in search of a tasty meal (Figure 4). It is quite possible that the damage done to the turf by the hunting animals is far worse than that directly caused by the grub feeding on the roots, so you have to be prepared to address this problem quickly with an appropriate insecticide to minimize further turf disruption. Insectivore feeding activity is more common in late spring or mid-fall when the grubs are fairly large in size, rather than mid-summer when the grubs are very early in development.



Figure 4. Animals digging for grubs near the surface of this lawn have caused this damage.



## When is the best time to treat?

When you first see grubs in the soil in spring, it is tempting to treat then, but generally speaking the levels of control are very poor at that time of year due to the physical size of the grub itself. Plus, the cool-season grasses are actively growing so the damage is minimal. It's when the adult beetles mate and lay eggs on the soil surface of the lawn in early summer that we enter the primary period of concern from grub damage because of the large numbers of grubs that begin to feed on the roots, and even though very small, they rapidly grow in size and have huge appetites. Fortunately, it is also the easiest time to control them with an insecticide because they are small. As insecticide research and development continues to refine product performance and safety, there are new generations of low use, very pest-specific insecticides (i.e. low impact on non-target insects) that offer extended control and greatly reduced possibilities of undesirable environmental on the market, and some of these products offer the potential for season-long grub control from spring applications.

## What can be applied for grub or beetle control?

Refer to the current VCE Pest Management Guide for a complete discussion of control options ranging from synthetic to biological control options. Of particular note is concern with some of our most common synthetic insecticides regarding potential non-target effects on pollinators. One of the most common grubicides, the active ingredient imidacloprid, has come under intense scrutiny because of a very visible misapplication several years ago that resulted in a massive bee kill from application of the insecticide to a blooming tree being foraged by thousands of bees. This costly mistake (costly on a number of accounts – the environment, the cost of the product, the perception of the use of the product etc.) was simply due to not following the instructions on the label regarding its application. To reemphasize the possible problems that can be caused by misapplications of these products, look for the “bee advisory label” (Figure 5) and then read the label very carefully regarding how to properly use the product. Most of the time, safe use of the product simply involves mowing the area to remove any flowers from clover, dandelions etc. (anything the pollinators might be visiting),

applying the insecticide according to the label rates, and then watering the insecticide into the soil. It can be that simple, but it IS that important to do in order to protect the pollinators.



Figure 5. Any pesticides that have potential to harm pollinators will contain a bee advisory label regarding how to safely apply these products for pest control and protection of the desirable pollinating insects.

There are several biological control agents (nematodes, bacteria, fungi) that provide grub control (though some are species specific) IF appropriate commitment is made to staying with the program and following the specific handling and application instructions. The biological approaches are not going to be as complete in their control activity as the synthetics, but they warrant consideration and university and industry evaluations on these alternative control methods continue. For any and all of these synthetic or biological options ALWAYS FOLLOW THE LABEL INSTRUCTIONS TO MAXIMIZE CONTROL AND MINIMIZE NON-TARGET EFFECTS. THE LABEL IS THE LAW.

## What about beetle traps?

No discussion on beetle control would be complete without something on beetle traps (Figure 6). ‘Beetle bags’ are highly effective in attracting and capturing beetles. The lures in the traps contain a sex pheromone that attracts the male beetles and a “flora lure” (i.e. something mimicking a “flower”) comprised of a chemical called eugenol that is attractive to both female and male beetles. The beetles enter the bag, and due to some great

engineering bag design, they can't escape. One can capture literally bags of beetles on a daily basis during swarm periods. And this brings up a critical point in maximizing their effectiveness -- empty the bags regularly, even daily, during the heaviest insect pressure periods. No, it's not a pleasant job, but this is the only way to use traps effectively.



Figure 6. Beetle traps can attract a lot of beetles but must be properly maintained in order to function as desired.

There have been testimonials that pulverizing the dead beetles (some have used a blender to make a beetle slurry... possibly referred to as 'Beetlejuice'?) in a blender and pouring this concoction around plants has 'beetle deterrent' properties, but we can't find peer-reviewed research to support this concept. Another suggestion is to drown beetles with soapy water, and then add those dead beetles into the compost pile. Extra chitin for the good guys to digest may result in higher compost quality. But if you want to wow (or gross out) your friends and neighbors, give it a try and let us know what you observe! And in general, be suspicious if a neighbor gives YOU a beetle trap as a 'gift'. Research many years ago indicated that although traps are highly effective in attracting and to some degree controlling the beetles (at least those that enter the trap), the net

effect is that the attractiveness of the traps led to more damage to surrounding plants as the beetles fed on nearby ornamentals while waiting for their opportunity to enter the bag. Clean traps regularly and place multiple traps within 30-40 feet of the plant material you desire to protect.

## In search of further information?

The podcast of this same title can be found in Turf and Garden Tips under the Lawn and Garden tab on the Virginia Cooperative Extension website. There are a variety of other beneficial podcasts and extension publications available on the VCE website that provide you with science-based tips that will help you have healthy, environmentally responsible lawns, landscapes, and gardens.

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