

Current Approaches for Control of White Grubs in New England



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Control of white grub populations that cause damage to turf is a perennial 'hot issue' for turf managers in New England. Adding fuel to the fire is the fact that several products that have been used in turf settings for 20 years or more (such as Oftanol™ and Turcam™) will no longer be available after 2004. Functionally, most of them are already gone from the market. Some of the "changes" are a result of the Food Quality Protection Act, a federal law passed in 1996, while other cancellations are a result of state laws.

Until recently turf managers had three basic approaches they could consider for control of white grubs in New England.

1. Wait until problems developed and spot treat with a fast-acting material like trichlorfon (Dylox™).
2. Apply a slow-acting but long lasting material like imidacloprid (Merit™) in the summer to prevent subsequent infestations.
3. Use an intermediate material in late summer.

The intermediate materials (most of which have either been removed from the market or are being phased out) usually worked within four to seven days after application and remained active for four to six weeks. We have essentially lost the "intermediates" for many aspects of turf management, so white grub control approaches are therefore restricted to the fast and the slow options.

The 'Slow' Options

Imidacloprid, often sold as Merit™ or under other trade names, features the following characteristics:

- Takes two to three weeks to start working, but
- Remains active two to six months, depending on when it is applied and how often it has been used in a given location.

Imidacloprid is **not recommended for use in the spring** because field trials conducted in Ohio, Pennsylvania, Massachusetts, and other locations over the years have shown that it does not normally have any impact on the grubs that are present in the soil in the spring. (In other words, grub populations are not significantly lowered in treated plots vs. untreated plots.) This is a source of frustration for academia because many formulators of imidacloprid aggressively market the products for "season-long control", which of course implies that an application made in the spring should control grubs that are already present. University research continually refutes that claim.

Imidacloprid normally should be applied **between late June and early August in New England** to maximize its effectiveness against the various species of white grubs that are found throughout the region. An imidacloprid application can be made slightly earlier if absolutely necessary, but in most cases the six-week window given above is 'ideal'. Such an application is in the soil as the eggs begin to hatch and the tiny larvae emerge. Note that imidacloprid is slightly less effective against European chafer than it is against Japanese beetle, and the timing of application becomes that much more critical when the primary species present is European chafer.

Another product that has a similar window of opportunity is halofenozide, often sold as Mach 2™. This product is a "molt-accelerating compound". It is not a traditional nerve poison, like so many other turf insecticides, but instead interferes with a grub's ability to molt successfully, either from the first to the second instar or from the second instar to the third instar. Once a grub reaches the third instar, halofenozide will have no impact on the insect. So late summer or early autumn applications do not make sense, because most grubs have already molted to the third instar stage by then. Similarly, **spring applications are not effective** because the grubs that are present in the spring are the same mature grubs that were present the previous fall. Hence, appropriate timing for a halofenozide application is just as the earliest eggs begin to hatch. That may be as early as late June for European chafer in southern New England or mid August for Japanese beetle in northern New England. (This is a prime example of why it is important to know which species of grubs you have in a given location prior to treatment).

The "Fast" Option

The only product that provides "after the fact" coverage for white grubs and is still available in the turf market is trichlorfon, usually sold as Dylox™. This material:

- Normally will kill grubs within one to three days after application.
- Breaks down in seven to ten days.

Trichlorfon is highly soluble and therefore quite mobile, so must be used with care in areas with sandy soils or shallow water tables. The fact that it breaks down quickly, however, usually minimizes the likelihood that the product will move to groundwater. Dylox™ **can be used in the spring** to "clean up" grub infestations that become apparent. Applications are not recommended until soil temperatures (top two inches) are at least 50 °F, and it is possible that even warmer temperatures are needed for good control. No field trials testing the efficacy of Dylox™ in different soil temperatures are known to exist, so this threshold is presented as a guideline. Late season applications can be made as late as mid to late September, particularly if the autumn is an unusually mild one.

Key Points

First, **any application made to control white grubs MUST be watered in**. The minimum amount of irrigation (and/or rainfall) following application should equal at least 0.1 inch, but in general the more water follows an application, the more effective it will be (up to a point, of course). Up to a half inch of water would be fine for Merit™ or Mach 2™, while up to 0.25 inch would be good for Dylox™.

The second key point is that **Merit™ and Mach 2™ normally should NOT be applied in April and May to control white grubs unless there are extenuating circumstances**. (Examples of extenuating circumstances would be: a golf course dealing with black turfgrass ataenius and trying to get control of both the BTA and Japanese beetle grubs, or possibly an athletic field complex that cannot water in an application in July or August.) Spring applications of Merit™ or Mach 2™ normally **will not reduce spring grub populations significantly**. Because spring applications occur at least four to eight weeks earlier than the ideal application period, they may be markedly less effective than a July application, particularly if the primary species is European chafer or oriental beetle.

A final, critical point: Trichlorfon (Dylox™), is not available to many turf managers in New England, for a variety of reasons. For example, trichlorfon **cannot be used on school grounds in Massachusetts**, nor can it be used **anywhere in Maine**. For turf managers affected by these regulations, there are some biological control options (such as entomopathogenic nematodes) that might help in some circumstances. Note however that the effectiveness of many of these products has been inconsistent, and there is no guarantee as to whether any of these products will work against the grub population in any given location.

DISCLAIMER: It is always the responsibility of the applicator to confirm the availability of a product **before** making an application. Keep in mind that some limitations (such as the ban of trichlorfon on school grounds in Massachusetts) will not appear on the pesticide label, but it remains the responsibility of the applicator to be familiar with all local laws and regulations. The pesticide label is the law, remember to read and follow all label directions. The mention of a commercial product does not imply endorsement by the author, UMass Extension, or the University of Massachusetts.

