

INNOVATIONS IN Turf Insect Pest Management

Combination products hold promise.

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In the '70s and '80s, turf managers had a number of products that essentially made turf insect control a non-issue. These products were based on organophosphates and chlorinated hydrocarbons, and active ingredients such as chlordane, diazinon and isazophos provided excellent long lasting residual control of turf insect pests. The problem, however, was that these products had a lot of environmental baggage and eventually were removed from the market due to pressure from the EPA.

Targeted pest control can be effective, but turf managers often need to use several different applications.

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This left a serious void that was partially filled in the '90s with the active ingredients imidacloprid and halofenozide. The application timing of these products was (and is) critical to their success. The timing requires turf managers to make multiple applications and pay particular attention to recommended timing, based on the behavior and life cycle of the insect pests when they are most susceptible to the insecticides. Modern day IPM is based on identification of the turf insect pest, monitoring pest population threshold levels and targeting an insecticide application specifically to that target pest. Targeted applications are effective; however, they are often inefficient and/or result in several pesticide applications being used throughout the growing season to control multiple targeted pests.

But a new possibility for effective insect control does exist.

Drs. Harry Niemczyk and David Shetlar discussed the concept of multiple turf insect pest control in their book, "Destructive Turf Insects." Up until now, the problem with this concept has been the availability of products that meet stringent EPA requirements for human and environmental safety, broad-spectrum control and long residual activity. New products recently introduced into the turf insect control market have the potential to fulfill the concepts of Niemczyk and Shetlar and provide turf managers with a tool to obtain multiple turf insect control and potential full-season control with one well-timed application.

NEW TECHNOLOGY BRINGS NEW OPTIONS

Newer turf insect pest management tools allow turf insect pest managers to rethink their way of controlling turf insects. In 2005, clothianidin was introduced into the marketplace. This neonicotinoid compound is very active against a wide range of insects and provides long-term control of several major insect pests. Its weakness is sporadic control and slow action. In 2008, a new premix product was introduced to the marketplace that contains clothianidin and bifenthrin with the intent that it would provide very broad-spectrum, consistent control of most (if not all) major turf insect pests,

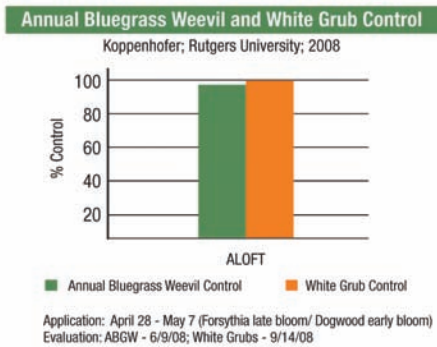


Figure 1: Example of multiple pest control with one early preventive application.

very quick knockdown and long residual control. The product, Aloft Insecticide, has been extensively researched by many turf entomologists over the last two years. In 2008 another product that contains chlorantraniliprole, Acelepryn, was introduced by DuPont. It also may have potential for control of multiple pests with one application.

THE CASE FOR A NEW PARADIGM

If the assumption is that one product can be applied for early-season insects and provide full-season control of all major turf insect pests, what's the problem? Several philosophical concerns have been raised regarding this concept:

USING TWO ACTIVES WHEN ONE WILL DO THE JOB

This concern is rooted in the IPM concept that only one active ingredient should be used to control a current insect problem. This concern assumes that the second active contributes nothing to the target insect pest control and just adds expense and additional insecticide load to the environment. This concept also discounts the fact that two products allow flexibility in timing for quick control of existing insects and season-long residual control of target insect pests that might escape the initial knockdown toxicity. Also not

considered is the potential synergy in using two actives against the target pest to obtain better control than when one is used alone.

APPLYING INSECTICIDE WHEN NONE MAY BE NEEDED

Responsible turf managers will not apply an insecticide before they have reasonable assurance that they will have an insect problem. Historically, the same insect pest problems occur every year and corrective measures must be implemented every year. If a turf manager monitors for the first insect pest that normally needs corrective action, then it makes sense economically and environmentally to apply a product that provides long-term control of that and multiple other insect pests. If monitoring is conducted and the first application is made when the first insect pest needs attention, insecticide is not wasted.

DIMINISHING THE IMPORTANCE OF IPM

On the contrary, the success of product mixtures with multiple modes of action depends on monitoring pest populations, accurately timing the application to the appearance of the first early season pest and then monitoring the turf for hot spots that may occur for various reasons throughout the season. Environmentally and economically, this method makes much more sense than making an application every time a different insect shows up.

INCREASING POTENTIAL RESISTANCE TO TWO ACTIVES

Research and historical use of single pesticides in multiple applications targeted toward at-risk insects has clearly demonstrated that the fastest route to resistance is the use of a single product. Typical examples are the bifenthrin



Turf managers are being forced to rethink the way they control insects.

resistance issues in Annual Bluegrass weevil in New England and the chinch bug resistance issues in Florida. Other disciplines, including weed control and disease control, have relied heavily on the use of mixtures to minimize the development of resistance. The Insecticide Resistance Action Committee (IRAC), an organization composed of experts in the pesticide industry, acknowledge that the use of mixtures is a valid resistance management strategy.

OVEREMPHASIZING CHEMICAL TREATMENTS

In most cases, a well-timed application of a combination product will be all that is needed for full-season turf insect pest control. Even if there are isolated hot spots, they can be cleaned up with a targeted spot treatment to the affected areas. Research and commercial use has shown that 0.375 pounds of the active ingredient in Aloft will provide control of early season insects and full season control of white grubs. Using conventional control practices, one to three applications of an insecticide for early-season insects followed by applications targeted toward white grubs is the norm. This results in a higher economical and environmental impact than a single, low-rate application early in the season.

WIPING OUT BENEFICIAL INSECTS

First, it is acknowledged that bifenthrin will depress populations of beneficial insects that come in contact with it. Clothianidin is relatively benign with respect to beneficial insects. Assuming those beneficial insects are important to turf insect pest control, then the question is, “Are beneficial insects present in April and early May when early season applications are made? If so, does the bifenthrin component stay around long enough to affect beneficial insect populations later in the season?” Since bifenthrin is a contact toxicant and relatively short lived, it’s assumed that it would have minimal impact on beneficial populations. The early season application of bifenthrin/clothianidin certainly will have less impact than conventional practices.

With products like these, turf managers can potentially make one application per

season and obtain full-season control of grubs and other insects. The bifenthrin component of Aloft is synthetic pyrethroid chemistry that is extremely active on a number of insects and provides very quick knockdown of insects that come in contact with it. The clothianidin component of the products is a new chemical of neonicotinoid chemistry that is much more active on insect pests than other neonicotinoid-based products on the market and is also much more persistent than other chemicals. What this combination brings to the table is the ability to apply the insecticide early in the growing season for insect pests and to get full season control of all white grubs without having to apply a product again when adult beetles lay eggs later in the season. In effect, it allows turf managers to obtain multiple insect control with one application based on their schedule, not the life cycle of the insect. A good example of this is control of Annual Bluegrass Weevil and White Grubs. The product can be applied once early in the season when the Annual Bluegrass Weevil adults are active (April or May) and that application can also control White Grubs that appear much later.

SUMMARY

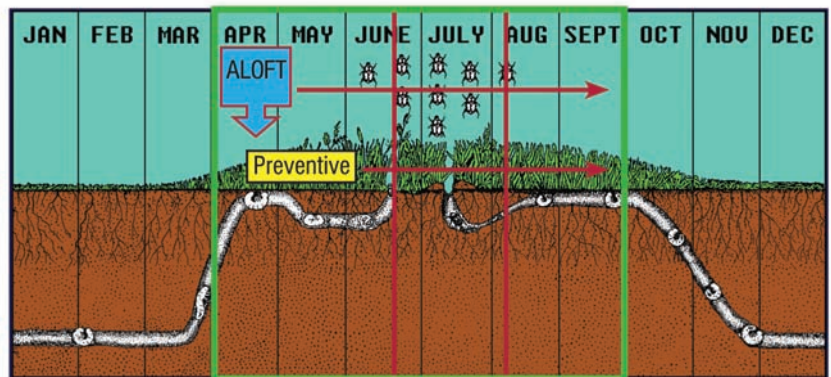
Interestingly, back in the early ‘90s, there



Turf managers can potentially make one application and obtain full season insect and grub control.

was outcry from the turf entomological community that IPM was dead. The organophosphate or chlorinated hydrocarbon chemicals were being eliminated. Bayer’s imidacloprid (Merit) was perceived as the antithesis of IPM because it had to be applied before insects reached levels to damage turf, and now imidacloprid is considered a component of IPM programs. To deviate from that paradigm with a new way of managing turf insects is considered by many a violation of IPM concepts. The future for turf managers is very bright, new products have come to market in the last few years and more will follow. This will give turf managers more flexibility and will allow them to select the turf insect management strategy that best fits their particular situation. ①

EARLY IS BETTER



- Annual Bluegrass Weevils
- Ants
- Billbugs
- Cutworms
- White Grubs
- Cinch Bugs
- Sod Webworms

Figure 2: Early preventive application timing of ALOFT to control early-season adults, surface feeders and white grubs.