Evaluation of New Chemical Treatments for Control of Japanese Beetles on Turfgrass

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Objective

Several novel, broad spectrum, insecticides have become available to the turfgrass industry over the past few years. Merit and Mach 2 have been widely used and have performed extremely well in our experimental evaluations against grubs and have also performed very well throughout our industry. We have reported on the performance of these two products over the past few years. A new product from Novartis Crop Protection is slated to become available for sale during the summer of this year (2000) and will add to the list of options for Japanese beetle grub control. The chemical is thiamethoxam and will be sold under the trade name 'Meridian'. The objective of this study was to compare the rate, application timing and irrigation effects of this new pesticide on the control of Japanese beetle grubs on turfgrass.

Rational

The advent of several 'new' chemicals to the arsenal of effective treatments has raised some concerns about relative effectiveness, and proper timing and application of the products for maximum control.

How It Was Done

Liquid sprays were applied at 1.35 gals. per 1000 sq. ft. using a TeeJet 8002 evs nozzle tip attached to a CO_2 powered back pack sprayer. Granule applications were made using hand held shakers to uniformly distribute the material across the plots. Treatments were applied uniformly to plots measuring 7 ft. x 7ft. All irrigated plots received 0.5 inches of irrigation immediately post-treatment. Treatments were applied in a randomized complete block fashion and were replicated 5 times. An untreated control plots was included in each replicate.

Results

Japanese beetles came early in 1999. First emergence, peak flight and peak egg oviposition were ahead of most years by up to two weeks. Warm temperatures throughout the summer together with a lack of normal precipitation during July, most of August and September, stressed much of Indiana's turfgrasses and compounded the effects of grub feeding.

Highlights from the thiamethoxam study included the following

- Thiamethoxam controls Japanese beetle grubs at levels comparable to both Merit and Mach 2. These levels often exceed 95% control.
- Thiamethoxam can be applied preventatively and boasts a very long activity window. However, as with our studies on both Merit and Mach 2, this chemical is most effective when applied near egg hatch.
- Thiamethoxam can also be effective when applied as a curative control, late in the season. While efficacy falls off over time, there appears to be a significant window of opportunity for this product to work well after egg hatch.

- While the effectiveness of the product is enhanced if application is followed by irrigation, watering delays of 3 or more days did not significantly influence its performance.
- All formulations of the product tested performed equally well.
- Grubs contacted by the product appear to quit feeding within hours, but do not die for periods of up to 1 – 2 weeks. It is important to remember that it is the grub feeding that most insecticide applications are designed to mitigate. Once the feeding is terminated, the turfgrass can resume normal growth. Some level of client education is needed if expectations of rapid grub death persist.

Conclusions

Thiamethoxam (Meridian) is a very effective control product against Japanese beetle grubs. It joins Merit and Mach 2 in our industries 'tool box' of effective, preventative products and because of its low impact on beneficial insects and low use rates, it is a very valuable tool in integrated pest management programs against Japanese beetles.