

INSECT IDENTIFICATION GUIDE

A TURFGRASS ENTOMOLOGY RESEARCHER'S VIEW

Dr. David L. Shetlar, Ph.D.

MAACH 2 represents the first insect growth regulator-type insecticide to come to the turfgrass market. Insect growth regulators—or IGRs—have been known to entomologists for many years and several pesticides have been formulated and used successfully in other markets, especially in the greenhouse and forest arenas. The beauty of IGRs, in general, is that they have very low toxicity to non-insect groups. IGRs can take many forms, but most interfere with the hormonal systems that insects use to grow, especially the process of shedding their skin (molting). MACH 2 falls into a group of compounds that researchers have dubbed the “MACs” which stands for “molt accelerating compounds.” When ingested, these compounds “tell” an insect that it is time to molt, whether this would be the correct time or not. The insect undergoes the molt and often does not survive because it is too early for a normal molt. MACH 2 is one of the MACs that seems to remain stable in the turfgrass environment and has activity on white grubs and most of the turfgrass infesting caterpillars, cutworms and sod webworms.

Because of its unique mode of action, entomologists are excited about using MACH 2 in resistance management. Many insects have become resistant to traditional organophosphate or carbamate insecticides that adversely affect the nervous system. It is much more difficult for an insect to develop a new molting method that would counteract the action of MACH 2.

Another unique attribute of MACH 2 is its relatively long residual life in turf soil and thatch. Early tests have suggested that insect active residuals remain for 60 to 100 days, or more. This efficacy period opens up other opportunities for using MACH 2, that is, multiple targeting of pests. Our studies in Ohio have suggested that MACH 2 can be applied in late May or early June on golf courses to manage the first generation of black turfgrass atenienus grubs, keep down black cutworm damage for



about 60 days *and* knock down the normal annual grubs (Japanese beetles and masked chafers) that appear in late July and August. Lawn care companies could also take advantage of such multiple targeting. There is also good data to show that MACH 2 does very well at controlling sod webworm larvae.

For those serious about IPM principles, especially where sampling is a must before a control product is applied, MACH 2 appears to have considerable activity on second instar white grubs and early third instars. They are usually present in late August and early September. Therefore, MACH 2 can be used as an early curative control insecticide.

In summary, MACH 2 brings to the turf insect control arena a new chemistry, long residual activity, multiple targeting capability, as well as curative action.



Top: Dr. David Shetlar examines turf for grub counts.

Below: volunteers help with grub counts at Ohio State University research plots

INSECT IDENTIFICATION GUIDE

HOW TO USE MACH 2 -

MACH 2 is available in two convenient formulations - MACH 2 Granular and MACH 2 Liquid. MACH 2 Granular is approved for use on all turf sites including residential lawns, golf courses, athletic fields and sod farms.

MACH 2 Liquid is approved for use on commercial turf sites including golf courses, office buildings, sod farms and similar settings. The liquid formulation is not yet registered for use on residential lawns or athletic fields. Consult product label for additional information.

PESTS CONTROLLED AND USE RATES FOR MACH 2

PEST	Formulated Product Use Rate		Formulated Product Use Rate		REMARKS
	PER 1000 SQ FT	PER 1000 SQ FT	PER ACRE	PER ACRE	
	MACH 2 LIQUID	MACH 2 GRANULAR	MACH 2 LIQUID	MACH 2 GRANULAR	
Cutworms	↑	↑	↑	↑	Apply at first sign of pest damage. A single repeat application can be made if needed.
Sod Webworms	1.5 fl oz	1.55 lb	2 qt	67 lb	
Armyworms	↓	↓	↓	↓	
Fall Armyworms	↓	↓	↓	↓	
WHITE GRUB LARVAE SUCH AS:					
Japanese beetle	↑	↑	↑	↑	Make only one application per year
Northern masked chafer	↑	↑	↑	↑	
Southern masked chafer	↑	↑	↑	↑	
European chafer	↑	↑	↑	↑	
Oriental beetle	↑	↑	↑	↑	
Asiatic garden beetle	2.2 fl oz	2.3 lb	3 qt	100 lb	
May/June beetle	↓	↓	↓	↓	
Black turfgrass ataenius	↓	↓	↓	↓	
Green June beetle	↓	↓	↓	↓	
Annual bluegrass weevil	↓	↓	↓	↓	
Billbugs	↓	↓	↓	↓	

Note: A minimum of 1 gallon of finished spray per 1000 sq ft is required for adequate spray distribution.

INSECT IDENTIFICATION GUIDE

VITAL FACTS ABOUT THE POWER OF MACH 2™.

- ▶ MACH 2™ Turf Insecticide mimics an insect-specific hormone that causes premature molting, disrupting the natural metamorphosis process.
- ▶ The residual power of MACH 2 spares the area from feeding damage by a new generation of grubs—making it an ideal preventative treatment.
- ▶ As a curative treatment, MACH 2 has the knockdown power that stops grub damage to the turfgrass within hours after it's ingested.
- ▶ One application can take you through the peak months of the season.
- ▶ No immediate irrigation needed, under normal turf-growing conditions with normal rainfall.
- ▶ Universities and turfgrass professionals have tested MACH 2™ Turf Insecticide extensively on numerous types of turfgrasses and grub species.
- ▶ Two convenient formulations are available: MACH 2 Granular and MACH 2 Liquid.
- ▶ MACH 2 is odorless.