

INSECT IDENTIFICATION GUIDE

INTRODUCTION:

Active insect pest infestations on managed turfgrass sites—from championship golf courses to low maintenance park lands—pose a persistent and difficult challenge to professional turf and grounds managers. Successful managers must combine a thorough working knowledge of the environment of their managed sites and the biology of the grass species with a



To accurately diagnose turfgrass damage, it is important to have a thorough understanding of multiple ways symptoms can be produced.

good understanding of insect pest distribution, insect life cycles, identification characteristics, site and plant symptomology, correct scouting techniques, and appropriate cultural and chemical control strategies. Given this daunting task, LANDSCAPE MANAGEMENT magazine and Mach 2 Turf Insecticide have produced this guide to managing a select number of turfgrass insect pests for use by professional turf and grounds managers. We believe that good turfgrass management, now and in the future, requires a combined and ongoing effort by all involved - managers, suppliers, and information providers. This LANDSCAPE MANAGEMENT guide provides photographs and descriptions of the most common Coleoptera and Lepidoptera pests including Japanese beetle grubs, sod webworms, cutworms, chafers, armyworms and many more.

Recognizing Insect Damage in Turf

Perhaps the most difficult task in correctly diagnosing damage caused by insect pest activity at

turfgrass sites is the process of differentiating site and plant symptoms produced by insects from those produced by either turfgrass diseases or abiotic causes (temperature and moisture extremes, site usage, or site management activities). Because many of the site and plant symptoms generated by non-insect activities closely resemble those caused by insects, the best way to make an accurate diagnosis of insect damage is to have a thorough understanding of the multiple ways these similar symptoms can be produced and how to use the keys for differentiating between them.

For managers with many long years of experience at one facility, the art of correctly diagnosing insect damage often comes as second nature, but to other managers who are often faced with multiple grass species at different sites under varying conditions, achieving a correct diagnosis is a matter of consistently applying a protocol designed to narrow down the possibilities.

This protocol will vary somewhat by site environment or region, species managed, management style, or site usage. The following five questions can help managers differentiate the causes of damage at turfgrass sites.

- 1) Do the symptoms have a regular or definable pattern, i.e., stripes, circles, tracks, etc.? If so, then look at mechanical activity, such as mowing, traffic, drainage, etc., as a possible cause.
- 2) Does the site show signs of animal activity or damage, such as birds feeding or turf torn up by skunks or raccoons? If so, then look for insect activity in the damaged areas.
- 3) Did the symptoms appear after a prolonged period of warm temperatures *and* high humidity? If so, then consider disease activity.
- 4) Does an examination of plants in affected areas not show any identifiable insect specimens or leaf, crown, or root lesions or disruptions? If this is the case, consider the sites' other management practices, such as misapplication of fertilizers or pesticides, as the possible cause.
- 5) Does examination of the affected plants show signs of feeding activity, such as damaged leaves, crowns, or roots or evidence of chewed plant material (frass) at the base of plants? If so, then, insects are the likely cause.

INSECT IDENTIFICATION GUIDE

Scouting for pests

Managers who are skillful at differentiating causes of turf damage should use those skills in a structured format known as pest scouting to provide early, site and pest specific data for making management decisions that are appropriate, accurate, and require the minimum input of material and labor needed to accomplish the goal.

Pest scouting should be done using a defined system on a regular basis by designated personnel.

For some managers, pest scouting can be a formalized structure that acts as the foundation for the use of data intensive Integrated Pest Management (IPM) strategies, while for others, scouting can be used as a viable alternative to traditional preventive pesticide applications based on regional or historic factors.

Either way, pest scouting should be done using a defined system on a regular basis by designated personnel. How the process is established is up to the individual preferences of the manager involved, but any successful scouting must include the following to be effective:

- ▶ accurate identification of pests involved;
- ▶ some means of quantifying numbers of pests found;
- ▶ some way of locating areas of pest involvement.

How these principles are applied for each pest species involved will vary. Some will require the use of light traps, sweep nets, hand lens, hand trowels, sod lifter, cup cutter, good observational powers, scouting during defined periods or on a weekly or biweekly basis, soap or insecticidal flushes, or written or graphed results. All three principles are required to provide managers with a consistent foundation to make the best control decision for their site, their site usage, their management style and, not the least, their operating budget.

Tips for accurate insect identification

Historically, when broad-spectrum, season-long



Knowing which species of insect is present and how that insect's biology relates to the grass species is critical for safe use of control materials.

control materials where available, knowing the species of insect involved in turf damage and how the insect's life cycle facilitated their control was not particularly important, since the nature and toxicity of the materials used blurred those distinctions. Today, knowing which species of insect is present and how that insect's biology relates to the grass species managed and the sites' usage is critical for the safe use of control materials in the current climate of increased environmental awareness and responsibility.

Accurate field identification of an insect species requires the acquisition of specimens; either the immature (larval) or the adult stage, or both. In many cases, several specimens are needed for an accurate identification. Regional or local land-grant universities have cooperative extension services or entomology departments that can help with identification. If you plan to use outside experts, proper preservation of samples is very important. Store collected samples using either shellac thinner or rubbing alcohol as a preservative solution.

Do not use just the visual examples provided in this guide as the sole means of insect identification. The more closely the other factors described in this guide relate to your site, its environment, and the known species distribution, the more accurate will be your insect pest identification.

CONTENTS

Surface feeders

Fall Armyworm	R5
Black Cutworm	R6
Bluegrass Sod Webworm, Large Sod Webworm	R7
Tropical Sod Webworm	R8

Surface/Soil feeders

Annual Bluegrass Weevil	R9
Billbug	R10

Soil feeders

Asiatic Garden Beetle	R11
Black Turfgrass Ataenius	R14
European Chafer	R15
Northern & Southern Masked Chafer	R16
Green June Beetle	R17
Japanese Beetle	R18
May/June Beetle	R19
Oriental Beetle	R20
Turfgrass entomology	R21
MACH 2	R22
Summary	R24

INSECT IDENTIFICATION GUIDE

MACH 2 Turf Insecticide is a new, unique tool in the professional turf and grounds managers' ongoing challenge to successfully manage insect pests.

Unlike most of the currently available turf insect management products, which are characterized by high toxicity, MACH 2 belongs to a new class of chemistry called the diacylhydrazines that offer low toxicity and high efficacy. This new class displays excellent control of grubs, sod webworms, cutworms, and armyworms.

How MACH 2 works

MACH 2 belongs to a new class of chemi-

cal compounds called molt accelerating compounds which interfere with the normal molting process of targeted pests. It targets the insect's own body chemistry in a unique and highly effective way. MACH 2 mimics hormones that cause the insect to molt prematurely, disrupting the natural metamorphosis

process. This causes the target insect to stop feeding shortly after it has been ingested. Later, the insect dies beneath the turfgrass surface. Although death may take up to three weeks, the treated insect will do no further damage.

MACH 2 offers applicators increased flexibility

MACH 2 Turf Insecticides' long residual combined with its systemic action offer applicators a highly effective control material with an expanded window of application.

MACH 2 can be applied any time from before eggs are deposited through the 1 - 2 instar growth stage of grubs and still provide 90% + control. University tests have shown that both the sprayable formulation (2SC) and the granular formulation (1.5G) are equally effective whether they are watered in immediately or not. This tremendous flexibility allows applicators to schedule treatments at times when conditions are favorable or when workloads permit and be assured of the same high levels of targeted insect control, whether or not rainfall is in the forecast.

MACH 2 Effect of Application Timing on Performance

% CONTROL

Treatment	Pre-Egg	Egg Lay to 1 Instar	1-2 Instar
MACH 2 (2SC)	100	99	93

3 Trials: OH, MA, GA (1995) Japanese Beetle

cal compounds called molt accelerating compounds which interfere with the normal molting process of targeted pests. It targets the insect's own body chemistry in a unique and highly effective way. MACH 2 mimics hormones that cause the insect to molt prematurely, disrupting the natural metamorphosis