

Insect control, cool-season turf

By monitoring your pest problems, you can combine IPM and conventional control measures.

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Effective insect control programs rely on an integrated approach which includes integrated pest management (IPM) practices.

The components of an IPM program are: accurate field diagnosis or monitoring, an understanding of economic or action thresholds, and selecting an appropriate control action.

Monitoring and proper identification of the pest and/or its damage symptoms are essential. Sampling methods may consist of both active and passive techniques which provide accurate and timely information on pest activity. Examples of active monitoring practices are visual observations by a trained individual or the use of flotation or irritant sampling techniques

to determine thatch-inhabiting insects. Passive techniques may include pitfall traps for the adult billbug or black light traps for cutworm and sod webworm moths. (Table 1)

Control actions may include only one or a combination of the following:

- chemical insecticides;
- biorational insecticides;
- establishing endophyte-enhanced grasses;
- conserving beneficials;
- adjusting primary cultural practices to minimize insect damage.

Insecticides labeled for control are listed in Table 1.

Two new chemical insecticides recently released or soon to be released are Lesco's Mainstay 2G and Merit, from Miles, Inc.

Mainstay contains the same active ingredient as Crusade (fonofos) but is formulated as a 2% granular. Fonofos has been shown to provide excellent (more



Endophyte-enhanced grasses provide excellent control of surface-feeding insects.

than 90 percent) control of white grubs, with a broad spectrum of activity.

The current labeling for this new formulation of fonofos will expand its use to lawn and commercial turfgrass sites.

Merit (imidacloprid) is expected to be released on a limited basis this spring. It is a chloronicotynyl insecticide having a broad spectrum of control. It has provided excellent control of white grubs in U.S. field trials and will be labeled for white grub control and for several sucking insects.

Biorational controls—Five biorational insecticides can be used for turfgrass insect control.

Biorational insecticides consist of materials derived from living organisms such as bacteria (Steward, Doom and Dipel), nematodes (Exhibit) and plant extracts (Turplex Bioinsecticide). These materials are specific to the insect pest, thus having minimal adverse effects on humans, the environment and beneficial insect predators and parasites.

The major disadvantage to the biorationals are high cost and high application rates.

Fungal endophytes (*Acremonium* sp.), which convey insect resistance, provide another important control option for the turfgrass professional. Endophyte-enhanced resistance has been reported in tall fescue, perennial ryegrass and the fine fescues for several surface-feeding insects such as chinch bug, sod webworm, billbug

Economic/aesthetic thresholds

The **economic threshold** level is the minimum number of insects which will cause turf or economic loss. Variation in the economic threshold level can occur. It may be due to changes in environmental conditions and/or cultural practices.

Aesthetic threshold is often used in ornamentals where the damage level, as perceived by the customer or the professional, is unacceptable. The aesthetic threshold is often set at 15 percent loss of plant foliage.

Billbugs—6-8 larvae/sq. ft., or 2-5 adults/day in pitfall traps

Black turfgrass *Ataenius*—30-40

grubs/sq. ft. for annual bluegrass and creeping bentgrass turf; higher threshold for other deep-rooter turf.

Chinch bugs—15-20/sq. ft.

Cutworms/armyworms—1-3 larvae/sq. ft.

Sod webworms—4-6 larvae/sq. ft.

Grubs

Japanese beetle—6-10/sq. ft. in Kentucky bluegrass; 8-15/sq. ft. for tall fescue

Masked chafer—8-15/sq. ft.

European chafer—10-15/sq. ft.

Asiatic Ganelis beetle—18/sq. ft.

Greenbug aphid—no thresholds yet established

and cutworm.

Predation—insects eating other insects—has ranged from 60 to 75 percent mortality in field studies. Indiscriminately using broad spectrum chemical insecticides will adversely affect beneficial predators such as ants, spiders and ground bee-

gles within a turfgrass stand. As new biorational insecticides are developed and released, they will give turfgrass professionals additional means of natural control.

For successful insect control, the turfgrass professional must rely on an inte-

grated program. This type of control strategy will result in better control at less cost and greater environmental safety.

—Dr. Mathias is turfgrass lecturer at the University of Maryland, Institute of Applied Sciences.

Cool-season insect control strategies

Pest	Monitoring program	Control action
Billbugs	Adults move into turf in April-May. Use pitfall traps to gauge Spring activity. Grub damage visible by June on Kentucky bluegrass, fine fescues and zoysiagrass.	Preventive applications if pitfall traps show high adult counts. Use Dursban, Tempo and Scimitar for adult control in April to mid-May. For grub control use one of the following: Sevin, Oftanol, Diazinon, Crusade, Mainstay, Triumph. Cool, wet summers favor a fungal disease outbreak of <i>Beauveria sp.</i> which reduces populations. Plant endophyte-enhanced grasses.
Black turfgrass Ataenius	Adults move into turf in late March-April. First generation damage by late June; 2nd generation damage by late July-early Aug. Serious golf course problem in annual bluegrass and creeping bentgrass.	Preventive applications if past history dictates, with Dursban in April. Soil insecticides such as Proxol/Dylox/Turcam, Crusade, Triumph, Mocap, Oftanol and Mainstay are recommended in June-Sept. time frame.
Chinch bugs	Prefer warm, sunny spots. Emerge as temperatures reach 70°F. Flotation sampling is effective.	Preventive applications in April-mid-May for habitual problem sites. Dursban, Diazinon, Sevin, Triumph, Tempo, Oftanol, Mainstay, and Turcam labeled for control. Cool wet summer favors fungal pathogens which control chinch bugs. Plant endophyte-enhanced grasses. Big-eyed bug a beneficial predator.
Cutworms Armyworms	Five species may be seen (caterpillars, adults) from May-September. Turf thins due to defoliation. Irritant sampling techniques flushes pests to surface. Common on bent green. Adults like light.	Labeled for control are: Sevin, Dursban, diazinon, Proxol/Dylox, Scimitar, Tempo, Crusade, Triumph, and Mainstay. Biorational products include Steward, Dipel, Exhibit and Turplex. Light irrigation may be required to work material into thatch. Plant endophyte-enhanced grasses.
Sod webworms	More than 20 species exist in U.S. Defoliation damage visible from May-Sept. High damage in July-late Sept. Irritant sampling techniques will flush larvae to surface.	Refer to insecticide list (biorational and chemical) for cutworms and armyworms. Also may use Oftanol, Turcam and Orthene. Plant endophyte-enhanced grasses.
Grubs	White grub species feed on roots. Damage appears as brown turf, easy to up-root.	Soil insecticides will give good to excellent control if watered in with half-inch of water. Labeled products include Dylox/Proxol, Turcam, Mocap, Mainstay, Crusade, Oftanol, Sevin, Diazinon and Triumph. Apply in mid-August-Sept. or in April-May. Milky spore disease(Doom) for Japanese beetle larvae only is recommended for community-wide treatments.
Greenbug aphid	Kentucky blugrass major host; worst outbreaks occur after mild winters followed by cool, wet springs.	Orthene, Dursban and Diazinon for control in June-Sept. period. Treat if turf turns yellow.

Triumph only for use by commercial lawn pest control personnel, and only on golf course greens, tees and aprons, and on sod farms. Crusade only for use in professional turf areas such as golf course and commercial sod. Diazinon may not be used on golf courses or sod farms.

Source: Dr. Mathias