

Insects and Insecticides in Utah Turf

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Major Turf Pests

Surface /Thatch Feeders (Leaf, stem):

- Armyworms
- Cutworms
- Sod Webworms
- Mites

Surface/Crown Feeders (burrow into stem, crown):

- **Billbugs**
- **Subterranean webworm**

Subsurface (root):

- **May/June Beetle (white grubs)**
- Masked chafers
- Japanese Beetle



Billbugs in Utah

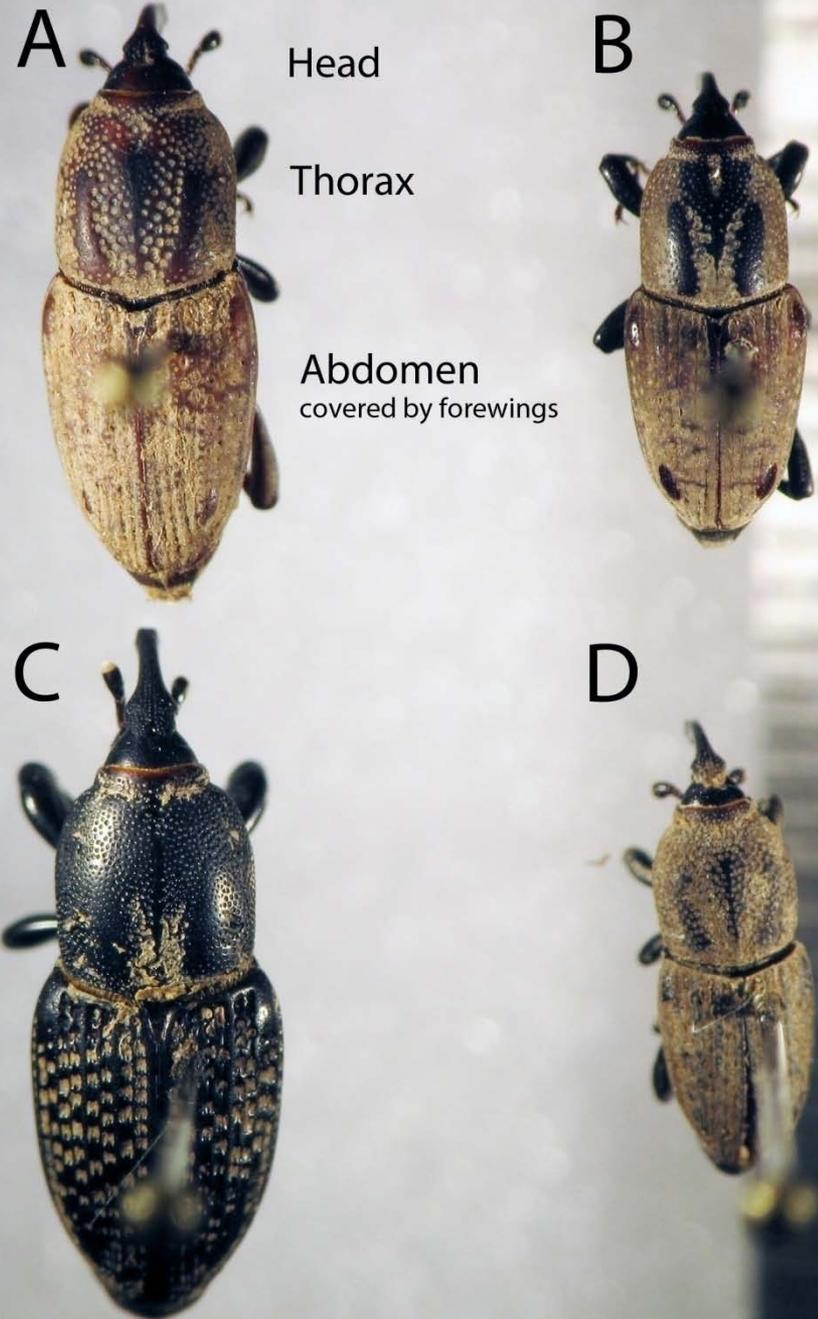
A) Hunting billbug*

B) Phoenix billbug

C) Denver (AKA Rocky Mountain) billbug*

D) Bluegrass billbug*

*common species



Billbugs



- Target young beetle stages (spring to early summer)

- Monitor adult activity
- Larva is the damaging stage
- Legless, small larva (key character)



Subterranean Sod Webworm

- Beige to brown moths fly in zig-zag pattern just above turf, especially around dusk
- Caterpillars are off-white to gray color
- Adults emerge mid-June, active 6-8wks



Subterranean Sod Webworm

- Target young larvae (summer to early fall)
- Consider treatment one week after peak of moth activity
- Apply insecticides late evening when adults are active

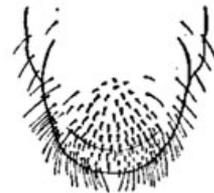


White grubs

- Scarab beetle family
- C-shaped white larvae
- Brown head, legs
- 1-3 year life cycle



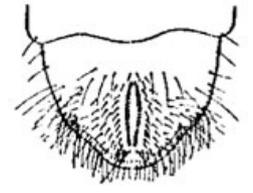
Identifying Rasters



Annual white grub
or
Masked chafer
(1-year grub)



Japanese beetle
(1-year grub)

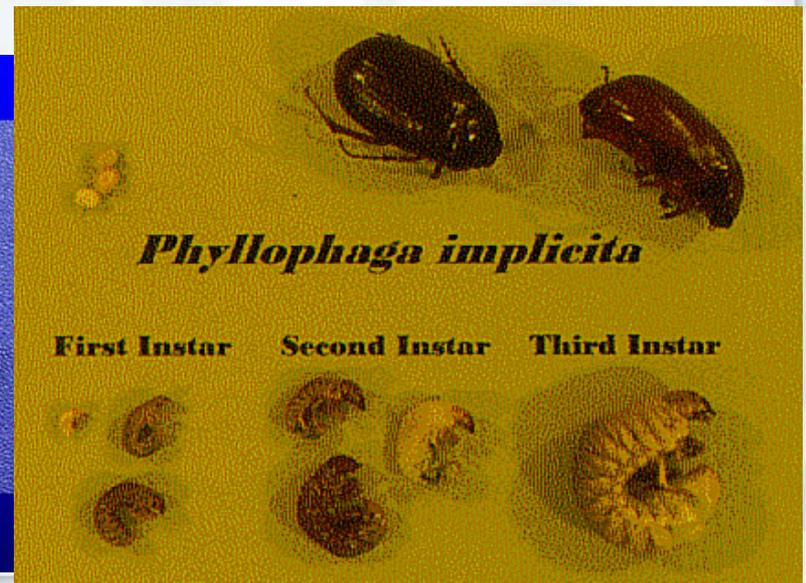


True white grub
or
May/June beetle
(3-year grub)

White grubs

- Target small larvae (late spring-early summer)
- Target larvae before they dig deep for winter (late summer-early fall)

Japanese Beetle Life Stages



Turf Insect Control

- Target young stages (i.e., small larvae)
 - Billbugs: spring to early summer
 - Webworms: summer-early fall
 - White grubs: summer-early fall before larvae move deep into soil
- Irrigate to move materials to larvae in thatch and upper root zone



Active ingredients with most products

For turfgrasses (lawns and golf course) and related insects (white grubs, billbugs, sod webworms)

1. Imidacloprid (100+)
2. Bifenthrin (100+)
3. Lambda-cyhalothrin (30+)
4. Permethrin (20+)
5. Carbaryl (20+)

Sod webworms fairly susceptible to these insecticides but not beetles



Notable Products

- Bifenthrin* (available to homeowner)
- Chlorantraniliprole (available to homeowner)
- Clothianidin* (available to homeowner)
- Imidacloprid* (available to homeowner)

*Some restricted use products:

Some bifenthrin ONLY products

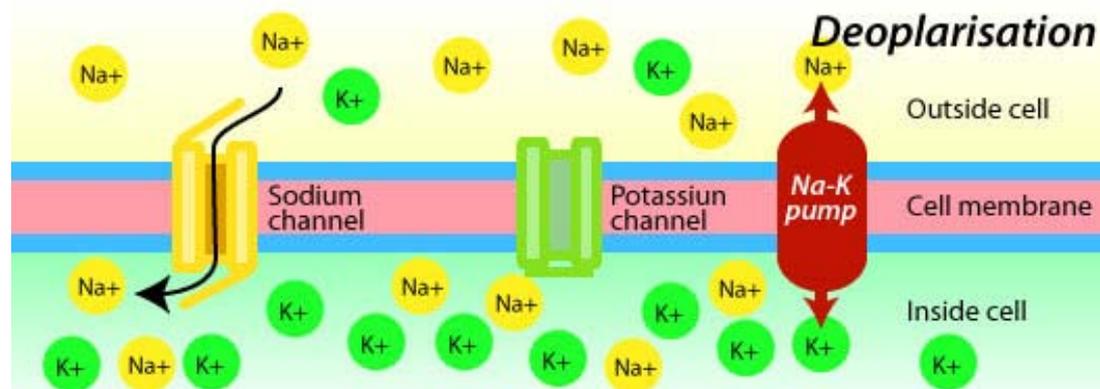
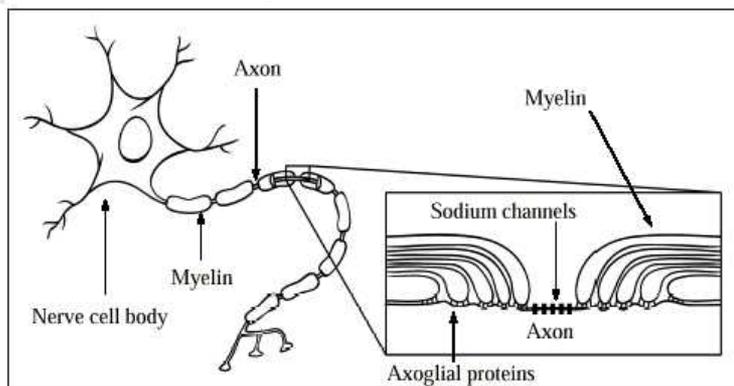
imidacloprid + bifenthrin

clothianidin + bifenthrin



Mode of Action Group 3A (pyrethroids/pyrethrins)

- Bifenthrin, cyfluthrin, lambda-cyhalothrin, deltamethrin, permethrin
 - Active through ingestion and contact
 - **No systemic activity**
 - Sodium channel modulators, keep sodium gates open in nerve cells



Be aware...

- Not good success when products contain ONLY lambda and gamma-cyhalothrin, bifenthrin, permethrin, deltamethrin, cyfluthrin for grub control.
- Thought to bind to organic matter at the soil surface and are difficult to move down where larvae feed.

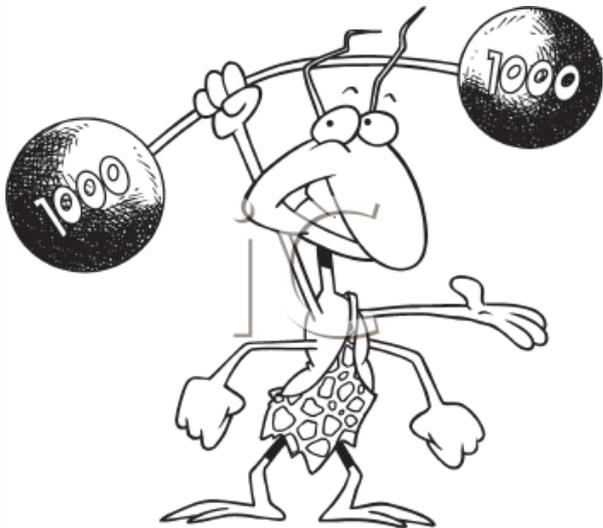
– **Least reliable in the soil**

Mode of Action Group 28 (Diamides)

- Chlorantraniliprole
 - Preventative Control
 - Newer active ingredient, not very water soluble so apply early to allow product to enter the soil
 - Ingestion required has little contact activity
 - Foliar and systemic activity
 - Very low toxicity to vertebrates

Mode of Action

- Chlorantraniliprole
 - Binds to and activates ryanodine receptors in muscle cells causing an uncontrolled release of stored calcium.
 - Depleted calcium stores leads to muscle paralysis and death

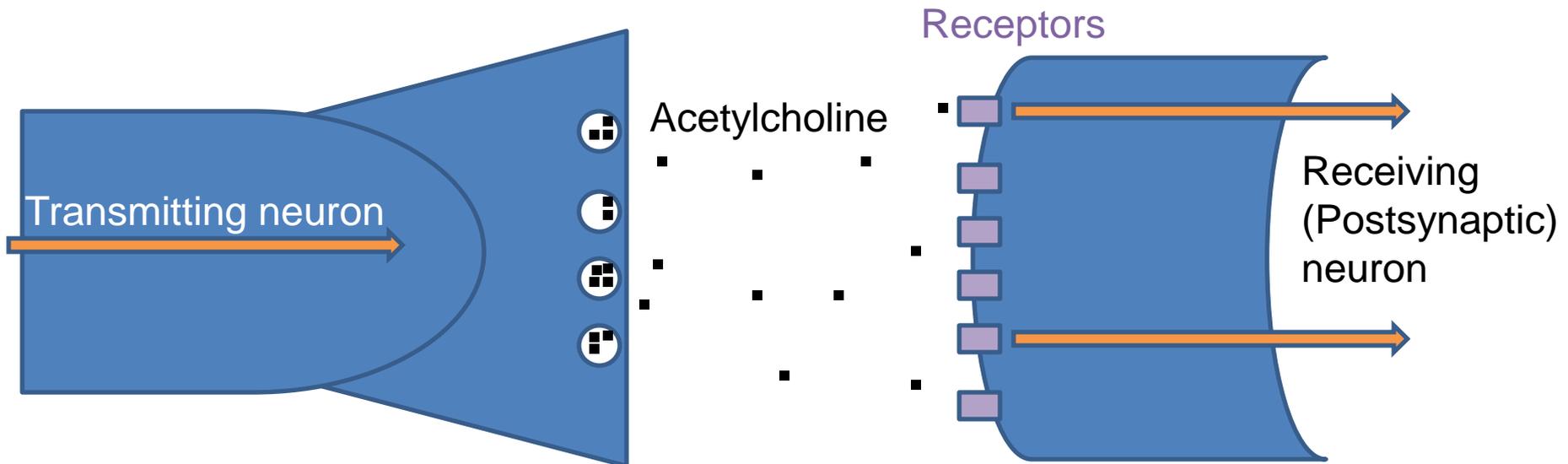


Mode of Action Group 4A (neonicotinoids)

- Clothianidin, Dinotefuran, Imidacloprid, Thiamethoxam
 - Active through ingestion and acute contact
 - Translaminar and root systemic
 - Low toxicity to vertebrates
 - Preventative Control and Curative (clothianidin)

Mode of Action

- Clothianidin, Dinotefuran, Imidacloprid, Thiamethoxam
 - Binds to specific nicotinic acetylcholine receptors on postsynaptic membrane connecting nerve cells causing excitation of nerves and eventually paralysis and death



Preventative Products

- Chlorantraniloprole, Imidacloprid, Clothianidin, Halofenozide*
 - Will not control established larvae in the spring or large larvae
 - Do work very well against newly hatched larvae

* Seven products registered in Utah; mimics hormone that regulates insect molting

Curative Products

- Carbaryl*, trichlorfon*, clothianidin
 - Multiple applications may be required
 - Mixed results

*Potential issue with Utah soils (pH 7.6-8.2)

Insecticide degrades quickly in pH 7.8 or higher

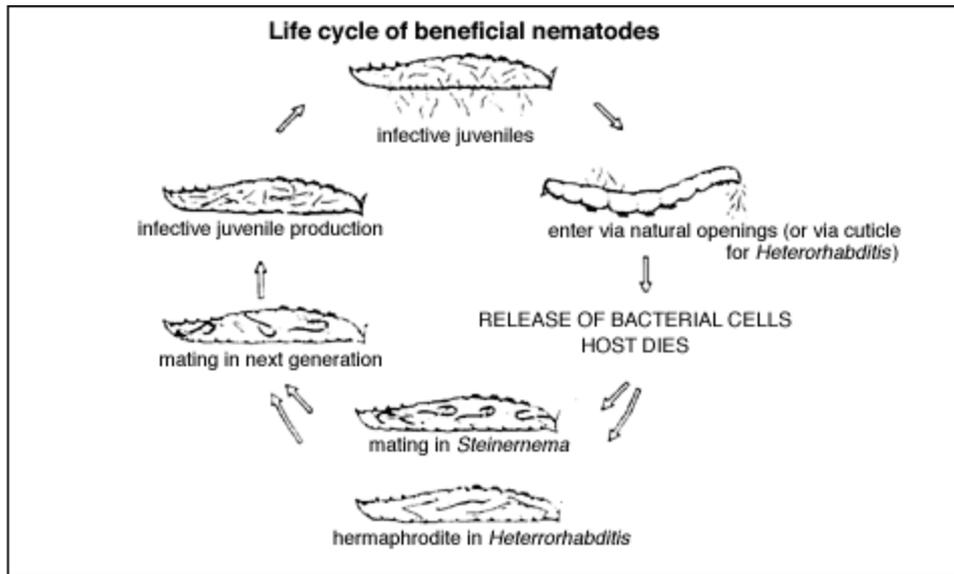
Be aware of...

Timing: Products are often sold from spring to fall however, the window of opportunity to effectively target the pest may be gone.

Product active ingredient changes: Same name different stuff

Beneficial Nematodes

- Life cycle and grub infection
- Associated with a bacterium that kills the insect



Beneficial nematode considerations

- Moisture important
 - Irrigation before and after application (soil)
 - Foliar application difficult
- Avoid UV exposure
- Compatible with standard spray equipment
 - Careful with high pressure
 - Remove fine screen



Be aware of...

- Milky spore disease
 - Also an insect pathogen
 - Only effective against Japanese beetle grubs
 - Other white grubs are not susceptible

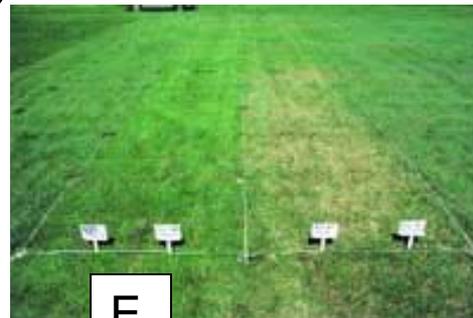


Endophyte Enhanced Turfgrasses

- Beneficial fungus that lives in turfgrass and contributes to the production of defensive chemicals that can be toxic to insects or deter insect feeding.
- Limited to fescues and perennial rye but Kentucky bluegrass can be protected when seeded/mixed together.



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UTAH PESTS fact sheet

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COOPERATIVE EXTENSION

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Turfgrass Cultural Practices and Insect Pest Management

Diane Ardon, Entomologist • Kelly Kopp, Turfgrass Specialist

Do You Know?

- Good cultural practices and prevention of stress are critical to keeping turfgrasses healthy and pest-free.
- Good turfgrass management is dependent on an optimal mix of culture and pest control treatments.
- There are four main insect pest groups that attack turfgrasses in Utah.

There are a number of insects that can cause serious and economic loss to turfgrass in Utah in home yards as well as in athletic fields and on recreational grounds. Good turfgrass cultural practices are the primary way to prevent insect infestation and turfgrass damage.

Mowing

As a rule, regular grass mowing height should be 2 to 3 1/2". To promote root growth and stress resistance of turfgrasses, mow regularly to keep mowing never more than one third of the desired leaf length or only one inch. Clippings should be removed and the leaves as a source of nutrients and organic matter. Consider mowing turfgrass areas to remove seed clippings and encourage upright growth of the leaves after a long winter under snow cover.

Fertilization

Nitrogen is of primary concern in turfgrass fertilization. In the early spring, apply a pound of slow-release nitrogen fertilizer per 1000 ft. of lawn area. This will help the grass recover from winter stress and drought. It will also be especially helpful for areas that have suffered damage.

Be to diseases such as pink and grey snow mold. In slow-release form, nitrogen fertilizer will provide a gradual source of nutrients as the growing season begins. Apply a second pound of slow-release nitrogen fertilizer per 1000 ft. of lawn area in one going to some extent. This will allow the grass to enter into the summer.

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White grubs

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What You Should Know

- White grubs are the larval stage of scarab beetles.
- Several different kinds of white grubs are found in Utah.
- White grubs prefer to feed on turfgrass roots.
- Many grubs can cause white grub feeding.

Damage Symptoms

White grubs chew off the turfgrass near the soil surface at just below the thatch layer. Bony signs of white grub damage include grass wilting or yellowing. However, the initial feeding injury often goes unnoticed until summer drought or turf repair is attempted. White grub feeding damage can be most apparent in the late summer when grubs are nearly fully developed. Small patches of dying turf can quickly join together if grub density is extensive.

Golf-damaged turfgrass becomes loosely attached to the soil as the roots are consumed. Newly damaged turfgrass can be lifted and easily cut away from the soil surface. Drought conditions can make turfgrass injury appear worse.

Description

Adult scarab beetles are identified by size and color pattern. Adults range in size from 0.5 to 1.7 inch and are tan, brown or black (Fig. 1). Scarab beetles are stout, oval-shaped, and have curved antennae. Adults have a pair of prominent forewings called elytra and a pair of membranous hindwings for flight. The first pair of legs are modified to help dig into the soil to lay eggs. Some adults are nocturnal and are only active at night.

Many of the white grub species established in Utah look similar to each other but vary in size. Mature grubs range in size from 1/2 to 2 inches; grubs are C-shaped and have three pairs of immature legs (Fig. 2). The head capsule is dark, but the body is usually creamy white in color. White grub species identification is often not necessary because the culture control practices are similar. The arrangement of hairs and spines on the posterior end of the grub, called the sterna, is a distinguishing feature between species (Fig. 3).

Fig. 1. White grub species are actually scarab beetles. Common scarab beetle adults are shown here (NOT TO SCALE).

Fig. 2. Common white grub body character? page 1

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