

Turfgrass Pest Management

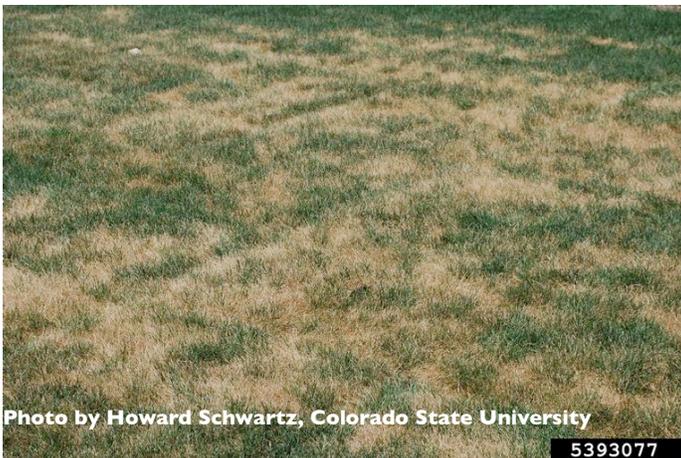
The management of turfgrass insect pests and diseases is most effective when an integrative approach is taken. Oftentimes, cultural practices will help grasses to resist and recover from pest damage. Resistant turfgrass varieties may also be available.

News/What to Watch For

There have been few arthropod pests of turfgrass diagnosed this fall. However, May/June beetles were diagnosed over the summer. Diagnosed diseases have included necrotic ring spot, anthracnose, and ascochyta leaf blight. Also, meet our new Extension Plant Pathologist and Entomologist!

Disease and Insect Activity and Information

Necrotic Ring Spot (*Ophiosphaerella korrae*)



Favorable Conditions: cool (40-60°F) and moist conditions, may be compounded by drought and compaction.

NOTE: Necrotic ring spot has been identified in Salt Lake County this fall.

Necrotic ring spot (NRS) primarily infects Kentucky bluegrass, though it may also be seen in annual bluegrass and tall fescue. The disease damages the

roots and crowns of the grass plants and the first symptoms are small, light green patches of turf that get larger over time. Frequently the turf will survive the infection and re-grow in the center of the patches, giving them a ring-like (“frog eye”) appearance.

Cultural Practices

Maintain the highest mowing height possible and follow recommended irrigation practices to prevent drought stress. Core aerate once annually to reduce thatch and avoid over application of N fertilizers.

Resistant Turfgrass Varieties

Kentucky bluegrass: Adelphi, Alpine, Award, Kelly, Eclipse, Midnight, Mystic, Nugget, NewStar, Odyssey, Unique, Wabash and Washington.

*Fungicide Options**

Azoxystrobin (Heritage®), myclobutanil (Eagle®), propiconazole (Banner MAXX®, Propiconazole Pro®), Fertilome Liquid Systemic Fungicide®, and azoxystrobin + propiconazole (Headway®).

Anthracnose (*Colletotrichum graminicola*)



Favorable Conditions: warm (80-95°F) and extended wet leaf conditions, excessive N applications, high compaction and high salinity.

NOTE: Anthracnose has been identified in Cache County this fall.

Anthracnose appears as irregular patches of brown grass (2-12 inches in diameter) due to brown or tan blotches on the leaves. Black fruiting structures occur on dead grass blades and can help to identify the disease. Older leaves are affected before newly developed leaves. New growth may remain green even while older leaves do not.

Cultural Practices

Limiting the length of time that leaves remain wet following irrigation will help prevent Anthracnose. Practices that improve air movement around turf sites are also helpful.

Resistant Turfgrass Varieties

All grasses are susceptible to anthracnose, but only bentgrass and annual bluegrass exhibit severe symptoms. Bentgrass: Penn A and Penn G.

*Fungicide Options**

Propiconazole (Banner MAXX®), azoxystrobin (Heritage®), fenarimol (Rubigan®), triadimefon (Bayleton®).

Ascochyta Leaf Blight (*Ascochyta* sp.)



Favorable conditions: hot (85-95°F) and dry conditions, preceded by cool and rainy conditions. May occur at any time of the year.

NOTE: Ascochyta leaf blight has been identified in Cache County this fall.

Ascochyta leaf blight (ALB) primarily affects Kentucky bluegrass, however, tall fescue and perennial ryegrass are also susceptible. Large, uniform areas of turf will turn straw colored as leaves start dying back from the tips. Leaves may exhibit die-back from 1/3 to 1/2 way down the blade.

Cultural Practices

Reduce thatch and aerify to promote water penetration in the area. Minimize wounding of leaf blades by sharpening mowing blades. Avoid excessive N fertilization which promotes rapid growth. Maintain even soil moisture conditions.

Resistant Turfgrass Varieties

At this time, there are no ascochyta resistant turf varieties available.

*Fungicide Options**

Because ALB does not damage turf roots or crowns, recovery is quick and fungicides are not generally needed. Tetrachloroisophthalonitrile (Lesco Manicure® and (Daconil Ultrex®).



Meet Claudia Nischwitz

Claudia Nischwitz (Claudia.Nischwitz@usu.edu) joined the Department of Biology at USU as Extension Plant Pathologist this year. A native of Germany, she moved to the United States for her graduate education, receiving her Ph.D. from the University of Idaho in 2005. Most recently, Claudia held a post-doctoral position at the University of Arizona where she worked on curtoviruses of beets and spinach and did diagnostics. She also started a collaborative project with Dr. Mike McClure, the nematologist at the University of Arizona, on identification and management of root-knot nematodes in golf course greens across the western U.S. She is looking forward to working with growers, county Extension agents, and golf course superintendents across the state. During her spare time, Claudia enjoys hiking,

Meet Ricardo Ramirez

Ricardo Ramirez (Ricardo.Ramirez@usu.edu) joined the Department of Biology at USU as Extension Entomologist this year. A native of El Paso, TX, Ricardo grew up as a “military brat” in Germany and Alaska. In 2008, Ricardo received his PhD in entomology from Washington State University, where he examined how biodiversity among soil organisms impacted microbial control of the Colorado potato beetle. Ricardo came to USU from Texas A&M University, where he was a post-doctoral researcher examining plant defenses for improving the suppression of insect pests in cotton. At USU, Ricardo will work with beneficial soil organisms and predators and plant defenses that suppress pest insects. Ricardo will be working primarily with turf, alfalfa and organic grower groups, however, his interests are broad and he looks forward to meeting and working with those working in turf and producers throughout the state. In his free time, Ricardo enjoys hiking and playing the guitar.

White Grubs (*multiple species*)

Life Cycle: Japanese beetles (Utah County) and masked chafers have one generation per year, May/June beetles have one generation every three years.

White grubs (WG) are the larvae of one of several different beetles in Utah. Damage occurs when the roots of the grass plant are chewed off just below the soil surface or thatch layer. Early damage is consistent with drought symptoms. As damage increases, the grass can feel spongy and will easily pull away from the soil surface. Secondary pests such as birds and raccoons may prey on WG in a lawn.

Cultural Practices

Properly irrigating and fertilizing turfgrass will help the grass to resist and recover from WG damage. Overly irrigating and/or fertilizing will make the lawn more attractive to white grub adults.

Resistant Turfgrass Varieties

The fine and tall fescues are less susceptible to WG damage than Kentucky bluegrass.

*Insecticidal Products**

Imidacloprid (Merit®), *Bacillus thuringiensis* (Bt®), Deliver®), *Steinernema carpocapsae* (Biosafe®, Biovector®, Exhibit®), azadirachtin (Ornazin®).

Recommended Cultural Practices for Spring

Irrigation

The irrigation season is already over in many parts of the state and this is particularly true in northern Utah. At this time of year, the decreasing temperatures and day length encourage grasses to go into dormancy. And dormant grasses are no longer taking up water or nutrients, so it's a good time to turn off irrigation clocks and blow the water out of irrigation systems. Of course, if you live in Washington County or other southern parts of the state, expect to keep irrigating turf areas for another 2 months.

Fertilization

Nitrogen is of primary concern in turfgrass fertilization. In the fall, apply 1 pound of quick-release nitrogen (N) fertilizer per one thousand square feet of lawn area. Time this application to coincide with natural precipitation, or water it in. This will help the grass enter into winter with energy reserves. It will also be especially helpful for areas that have suffered damage due to diseases such as necrotic ring spot. In a quick-release form, N fertilizer will provide an immediately available source of nutrients to the grass.

Aeration/Cultivation

Fall is also an ideal time to aerate your lawn if the soil is compacted or there is a significant layer of thatch beneath the grass. If the thatch underneath your lawn is more than 1/2 inch thick, consider core aeration to stimulate the natural decomposition process. Likewise, if you have a very fine-textured soil, compaction may occur, particularly in high traffic areas. Core aeration will help to alleviate this compaction.

Seeding & Over-seeding

Fall also provides the ideal opportunity to seed new turfgrass areas or to over-seed areas that may have been damaged over the summer. The cool temperatures will promote germination and growth of cool season turf species such as Kentucky bluegrass, tall and fine fescues, and perennial ryegrass. Choose pest resistant or recommended turfgrass cultivars when possible.

Focus On: Using Nematodes to Control Turfgrass Pests

Nematode Basics

Nematodes are multicellular roundworms, and range in size from microscopic to over 8 m in length! They are commonly known for the diseases they cause in plants and animals, but some are beneficial because they kill various turfgrass and insect pests. Of the 9 families of entomopathogenic nematodes (nematodes that kill insects), species from 2 of the families dominate the pest management market, Heterorhabditidae (HH) and Steinernematidae (SN). Species of nematodes in these families are highly toxic to insects, but safe for humans, animals, and plants. Interestingly, these nematodes don't directly kill their insect host, but kill via septicemia by releasing the symbiotic bacteria they carry.

Nematodes for Turfgrass Pest Control

Once your turfgrass pest has been identified, you can select a commercial product to suit your needs. The turf pest you have will dictate the species of nematode you need to purchase, so know your pest first (see table below). Cruiser nematodes (*Heterorhabditis*) are better applied to more sedentary pests like white grubs and billbugs. Ambush nematodes (*Steinernema*) are better suited for cutworms and sod webworms. Nematodes are readily available at some garden centers and online stores. Call your local garden center for availability or check the following website for a list of biological control supply companies from Bugwood.org (http://wiki.bugwood.org/Steinernema_spp.).

Nematode	Type	Pests Controlled
<i>H. bacteriophora</i>	Cruiser	Scarab beetles (white grubs)
<i>H. bacteriophora</i> , <i>S. carpocapsae</i>	Cruiser, Ambush	Billbugs (larvae)
<i>S. riobravis</i> , <i>S. scapterisci</i>	Ambush	Mole crickets
<i>S. carpocapsae</i>	Ambush	Armyworms, cutworms, webworms (larvae)

For turf pests, it is recommended that you apply around 250 million to 2 billion nematodes per acre, which is about 6,000 to 46,000 per ft² depending on the pest. Generally, 1 billion nematodes per acre is the standard application rate for good control. Most of the products for sale contain 10, 50, 100, and 500 million active nematodes per package, however, underapplication of nematodes at some manufacturers' suggested application rates of 100 million per acre, etc., will likely yield poor control. Use the above recommendations instead.

Once dissolved in water, nematodes can be easily applied with a hose-end nozzle sprayer, conventional spray equipment, or through irrigation systems. Because many formulations contain clay, etc., it is recommended that screens be removed from nozzles to avoid clogging. Nematodes tend to drop out of solution during application so constantly stir, shake, or agitate the nematode solution throughout the spraying process. Avoid very high pressure applicators as they may be detrimental to nematodes.

Because Utah is so arid and hot, successfully using nematodes will depend on your pre- and post-treatment processes. Before application, water the turf thoroughly as nematodes have a higher survival rate when applied to wet soil. Apply nematodes early in the morning (before sunrise), or late in the evening after sunset. After application, thoroughly water the turf to help flush nematodes down into the soil. Exposed nematodes will be killed by the sun (drying and heat) the following day if they are left above ground. Water regularly to supply nematodes with moisture to prevent desiccation, and so they can move throughout the soil. Nematodes can become stuck in the thatch layer so consider dethatching before applying nematodes if you have a thick thatch layer. Fortunately, nematodes are fairly resistant to most insecticides and fertilizers. *Steinernema riobravis* is a more heat and desiccation-resistant nematode that is currently under development. It may become a viable option for turfgrass application in the future.

If properly handled, applied, and cared for, nematodes can be an effective, non-chemical approach to turfgrass pest control in Utah. Greater success will be likely for turf pests that live below the surface (white grub and billbug larvae), because the nematodes will be sheltered from our brutal summer sun. Nematodes can be used on a variety of non-turf pests as well, such as strawberry root weevils, fungus gnats, or woodboring beetle larvae inside trees (spray nematodes into galleries). New species from arid regions are being developed which have higher heat and lower moisture requirements. As the trend for least toxic and chemical free pest control continues, expect to see an expanding selection of nematodes and other biological controls on the market.

-Ryan Davis, Arthropod Diagnostician, Utah Plant Pest Diagnostic Laboratory

And Speaking of Nematodes.....We Need Your Help!

My name is Claudia Nischwitz and I am the new Extension Plant Pathologist at Utah State University. I am involved in a survey of golf course greens in the western United States for root-knot nematodes. Root-knot nematodes are microscopic roundworms that feed on the roots of turfgrass and can cause yellowing and dieback. They have gained attention as a serious threat to both cool and warm-season turf grasses in the western U.S. In 2008 Nemacur® (fenamiphos), the only chemical pesticide with long-term effectiveness against root-knot nematodes, was removed from the market. This leaves superintendents without effective and economical management options. Dr. Mike McClure of the University of Arizona and I are working on the development of new management strategies to manage root-knot nematodes.

To develop a new management strategy that is effective across the wide range of soils, climate and turf varieties found in Utah and other western states, we first have to identify the species of root-knot nematodes found in golf course greens and the type of turfgrass they feed on. We collect 8-10, 1-inch diameter soil cores from one to two greens per golf course. The cores are 2-3 inches deep. So far I have collected samples from 14 golf courses in Utah and I want to *thank those superintendents for giving me permission to collect samples!* I would like to collect more samples this fall before it gets too cold and also next summer. If you are willing to let me collect samples from a green from your golf course, I would very much appreciate it. My email is: claudia.nischwitz@usu.edu and my office phone number is 435-797-7569. I will notify you with the results for the samples from your golf course as soon as I have them. Thank you for helping us develop new management strategies against root-knot nematodes.

-Claudia Nischwitz

Relevant USU Extension Fact Sheets

Turfgrass Management

http://extension.usu.edu/files/publications/publication/HG_517.pdf

http://extension.usu.edu/files/publications/publication/HG_Grass_2004_01.pdf

<http://extension.usu.edu/files/publications/factsheet/turf10.pdf>

Diseases

<http://utahpests.usu.edu/plantdiseases/files/uploads/PDFs/necrotic-ring-spot08.pdf>

Insects

<http://extension.usu.edu/files/publications/factsheet/white-grub07.pdf>

***Precautionary Statement:** All pesticides have benefits and risks, however, following the label instructions will minimize the risk and maximize the benefit. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.

Turfgrass IPM Advisory
is published seasonally by Utah State University Extension.

Editor: Kelly Kopp, kelly.kopp@usu.edu
For archived advisories, visit <http://utahpests.usu.edu/ipm/htm/advisories/turf>.

Utah State University is an affirmative action/equal opportunity institution.
