Turfgrass IPM Advisory

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Turfgrass Integrated Pest Management
An integrative approach to the management of turfgrass insect pests, diseases and weeds is most effective. Prevention is the best strategy!

What to Watch For

Another terrific winter! The focus should now be on getting off on the right foot with turfgrass management and recovery from winter kill and diseases like snow mold. Seeding and overseeding, irrigation system maintenance, and aerating are other management practices to accomplish at this time of year.

Letter from the Editor

Dear Turfgrass Enthusiasts,

I hope that your spring is off to a terrific start! Hopefully, you're starting to think about the management practices that will help your turfgrass begin the growing season in good condition.

Perhaps you've seen some winter kill of your turfgrass, in which case read on!

Perhaps you've come out of winter with turfgrass damage from snow mold, in which case read on!

Perhaps you are thinking about how hungry your grass is after its long winter nap, in which case read on!

And hopefully you're also thinking about watering your turfgrass efficiently when the time comes. We've addressed that topic as well….if you read on! LOL.

Please also keep an eye out for a special edition of this advisory addressing pre-emergent weed control and other turfgrass weed topics soon.

Wishing you all a happy spring and healthy turf!

Kelly Kopp, Editor, Turfgrass IPM Advisories

"Spring is when you feel like whistling. Even with a shoe full of slush!" -Doug Larson

Installing the next research project!

Turfgrass Fertilization

Turfgrass quality is directly affected by the ability of the grass to look and function as needed. That quality may be described in terms of visual appearance and/or functionality. Visual quality is determined by the combination of turfgrass color, density, uniformity, growth habit, and smoothness. Functional quality is determined by resilience, recuperative capacity, rooting, rigidity, and elasticity. *In either case, fertilization is the management practice with the most potential for improving turfgrass quality.*

Similarly to humans, nutrients perform specific roles in turfgrass growth, development, and stress tolerance. For example, turfgrass fertilizers often include nitrogen (N) which can improve color (darker green, more chlorophyll), density, root growth, stress tolerance, and recuperative potential. Turfgrass response to phosphorus (P) fertilizer includes improved root growth and branching, drought tolerance, water use efficiency, and seedling establishment. Adequate potassium (K) fertility increases disease resistance, cold and heat tolerance, and improves overall ability to endure and recover from stressful conditions. Turfgrass responses to these nutrients demonstrate that proper nutrition can have a strong impact on turf quality and performance.

In Utah, we most often focus on N fertilization of turfgrasses because our soils tend to be adequate in P and K. However, it is always good practice to test your soil to determine actual nutrient status as well as other important soil characteristics like soil texture, pH, and organic matter content. If you indicate on a soil sample submission form that the soil is being tested for an existing turfgrass area or that it will be planted with turfgrass, your soil test report will include guidance on recommended turfgrass N fertilization rates and timing.

Grass Species

The nutrient requirements of different turf species are widely variable and are also affected by environmental conditions. Generally, the more you'd like the grass to grow, the more fertilization, particularly with N, will be required. To a point. Over-fertilization is also to be avoided due to the potential for environmental contamination. Table 1 provides N fertilization recommendations for the cool- and warm-season grasses most commonly grown in Utah.

Environmental Conditions

Soil. Soil characteristics have a big impact on best fertilization practices of turf. Sandy soils are usually more infertile and require more intensive nutrient management than loamy or clayey soils. Soil testing should be used to guide turf management and fertilization decisions. For example, many Utah soils have adequate P and K and will therefore require less P or K from fertilizer.

Water and Irrigation. Turfgrass growth requires proper irrigation and/or adequate rainfall which also increases turfgrass nutrient requirements. On the other hand, excessive rainfall can cause N leaching, may contribute to undesirable N loss in runoff, and may also result in turf N deficiency.

Shade. Shaded areas should generally not be fertilized as much as non-shaded areas. Grass in shaded areas usually has a lower rate of growth and therefore lower nutrient requirements. Also, turf in shaded areas tends to have a weaker root system and to be more succulent.

Clipping Management

Whether or not clippings are left behind is an important consideration. Where lawn clippings are removed, fertilizer requirements will be higher since nutrients are being removed with each mowing. Consider that the concentration range in healthy turfgrass shoot tissue is 2.8 to 3.5% N, 0.20 to 0.55% P, and 1.5 to 3.0% K. In some cases, half or more of seasonal N needs can be met by returning clippings.

Lawn Age

A new lawn will usually require more fertilizer, and a different analysis of fertilizer than an established lawn. Soil testing is especially important to guide the type of fertilizer needed for new lawns.

Table 1. Nitrogen requirements for cool-season and warm-season turfgrasses per growing month			
	N Requirement (Pounds N per 1000 ft^2 per Growing Month*)		
Cool-Season Grasses			
Common Name	General Turfgrass**	Recreational Turfgrass**	N Requirement
Kentucky bluegrass			
*Common	0.1 - 0.3	0.2 - 0.6	Low - Medium
*Improved	0.3 - 0.4	0.4 - 0.8	Medium
Tall fescue	0.2 - 0.4	0.3 - 0.7	Low - Medium
Perennial ryegrass	0.2 - 0.4	0.4 - 0.7	Low - Medium
Fine fescues	0.2 - 0.4	0.3 - 0.5	Low
Creeping bentgrass	0.3 - 0.6	0.3 - 1.0	Low - High
Wheatgrasses	0.1 - 0.2	0.2 - 0.5	Low
Warm-Season Grasses			
Buffalograss	0 - 0.2	0.2 - 0.4	Very Low
Blue grama	0 - 0.2	0.2 - 0.4	Very Low
Zoysiagrass	0.2 - 0.3	0.3 - 0.6	Low - Medium
Bermudagrass			
*Hybrid types	0.4 - 0.6	0.6 - 1.5	Medium - high
Buffalograss	0 - 0.2	0.2 - 0.4	Very Low
Blue grama	0 - 0.2	0.2 - 0.4	Very Low
Zoysiagrass	0.2 - 0.3	0.3 - 0.6	Low - Medium

*Growing months are months in which the grass is actively growing and not dormant or semi-dormant.
**Nitrogen requirement rates per month are for determining total N needs based on the number of growing months per year. General turf refers to lawns, amenity turfgrass areas, and general grounds. Recreational turfgrasses are grasses used for golf courses and other sports.

Soil Testing Information

Utah State University's Analytical Laboratory offers testing and analysis of soils that can help guide turfgrass fertilization programs. Soil testing quantifies the nutrients that are available in the soil and also reveals what nutrients are present in excess amounts that should NOT be added. Applying nutrients needlessly results in soil chemical imbalance and plant problems. Excessively applied nutrients may also contaminate water, adversely affecting public health and the environment. A routine soil test is typically all that's required to help guide turfgrass fertilization, but there many other soil test options available through the laboratory that may be of interest depending on your particular situation.

-Adapted from Best Management Practices for Turf and Lawn Fertilization by Dr. Mike Stewart, International Plant Nutrition Institute

Snow Mold

A good snowpack this year means a high risk for snow mold damage in turfgrass. Snow molds are cold-loving fungi that attack turfgrass under snow cover, or during persistent cold and wet conditions. Snow mold development most commonly occurs in late winter/early spring, but can also occur in fall under favorable conditions for the pathogen. Extensive damage caused by snow mold is common in areas with deep snowpack and shaded areas where snow remains for longer periods. Snow mold disease can largely be managed with cultural practices and, in most cases, the turf will recover as conditions warm and dry.

Description

There are several snow mold fungi. Two of the most common in Utah are pink snow mold (also known as Microdochium patch) and gray snow mold (also known as Typhula blight). Both diseases cause patches of matted grass blades and may occur together on the same plant. Light fuzzy mycelium growth is often observed near receding snow cover in the spring.

Pink snow mold (*Michrodochium nivale*) symptoms include pink, grey, or tan colored patches of dead and matted leaf blades, often including a visible outer ring of copper-colored grass. Patches can range from 2 to 10 inches in diameter and be larger if they merge together. Clusters of pink spores develop on the surface of leaf blades under prolonged periods of leaf wetness.

Gray snow mold (*Typhula ishikariensis*) symptoms are similar to pink snow mold. Patches of grey snow mold can range from a few inches to several feet in diameter. When conditions remain favorable for pathogen growth, patches can expand and coalesce, creating larger areas of damaged turf. As the fungus spreads, initially infected grass in the center of the patch begins to recover and re-grow while the newly infected grass blades turn grey or tan, causing a ring-like or "frog eye" appearance.

Figure 1. Mycelium growth caused by snow mold near receding snow (PCs: Helen Muntz).

Management

Snow mold usually can be managed without the use of fungicides, particularly in residential settings. Rather than focusing on fungicides in these areas, employ cultural (management) practices to reduce severity of snow mold damage and facilitate recovery.

Snow Mold (cont'd)

Cultural Control Options

- Avoid and/or remove high, long-lasting snowbanks.
- Apply only moderate or low amounts of nitrogen fertilizers during fall fertilizer applications.
- In fall at last cutting, gradually reduce turf height to avoid matting under snow.
- Avoid extreme thatch build-up through annual core aeration.
- Rake and remove dead turf blades to encourage dryer conditions and reduce spread of snow mold.
- Apply a light application of nitrogen fertilizer in early spring to help promote new growth.
- Fungicide treatment is not recommended for snow mold treatment on home lawns.

Commercial Treatment Options

- Prioritize cultural control options listed.
- Preventative fungicide* use may be warranted on golf courses, sod-farms, and some sports fields.
- Fungicide application should be made roughly 2 weeks prior to snowfall. Late winter or early spring fungicide applications may be also be necessary depending on severity of disease.

Figure 2. Dead, matted grass blades effected by snow mold with signs of fungal bodies (PC: Helen Muntz.

Figure 3. Reddish-brown sclerotia of grey mold (PC: Helen Muntz).

Active Ingredient*	Fungicide class, FRAC code, and plant mobility classification
metconazole	DMI, 3, acropetal penetrant
iprodione	Dicarboximide, 2, local penetrant
fludioxonil	Signal transduction, 12, local penetrant
chlorothalonil	Chloronitrile, M5, contact
PCMB (quitozene)	Aromatic hydrocarbon, 14, contact

-Written and contributed by Helen Muntz, M.S., USU Extension Assistant Professor, Horticulture, Weber and Morgan Counties

Winterkill of Turfgrasses

When turfgrasses die over the winter months, it may generally be described as "winterkill" (Figs. 4 and 5). The term covers a multitude of causes of turfgrass death in the winter, which may include snow mold, low temperatures, dessication and crown hydration.

Figure 4. Winterkill symptoms in turfgrass.

Crown Hydration and Dessication

Crown hydration is of most concern during the warmer days of late winter/early spring when there is the potential for warm daytime temperatures followed by a hard freeze. Turfgrass may start to take up water as temperatures warm and then re-freeze rapidly. As a result, ice crystals may form in the crown of the plant, rupturing cells and causing death.

During the winter when turfgrass plants are dormant or semi-dormant, drying of the leaves or plants (dessication) may cause death. Dessication is typically only a factor on elevated or extremely exposed or windy sites, and areas where surface runoff is rapid.

Low-Temperature Kill

Different turfgrass species are naturally more or less hardy in cold temperatures. In addition, the rates of freezing and thawing, the number of times frozen, and post-thawing treatment of the turf also affect low-temperature injury to grasses. Of greater concern than air temperature for low-temperature kill of turf is soil temperature, since the crowns of the plants reside within the soil.

Recovery from Winterkill

Confirmation of winterkill is necessary before going to the trouble and expense of reestablishment. If you suspect winterkill, take samples of the damaged area and place them in a warm area to see if the turf greens up. Allow two weeks of recovery time before deciding on reestablishment practices.

If reestablishment is indeed warranted, seeding or sodding may be necessary to facilitate recovery. Well-defined areas of damage may be stripped of dead turf and re-sodded. Areas of more scattered damage may be more easily reestablished by seeding. It will also be critical to divert traffic from newly seeded or sodded areas, and to provide light fertilizer applications to stimulate growth. Appropriate irrigation during the reestablishment period will also ensure that the seedbed or sod stays moist.

Figure 5. Winterkill on a golf course putting green exacerbated by cross-country skiing.

-Adapted from Michigan State University's Fact Sheet Winterkill of Turfgrass (E0019TURF) by Dr. Kevin Frank

Recommended Management Practices for Spring

Seeding/Over-seeding

Spring provides the opportunity to seed new turfgrass areas or to over-seed areas that may have been damaged over the winter. The cool temperatures will promote germination and growth of cool season turf species such as Kentucky bluegrass, tall and fine fescues, and perennial ryegrass. Be aware, that there will be also be annual weed pressure at this time of year and consider your weed control options. Choose pest resistant or recommended turfgrass cultivars when possible.

Irrigation Maintenance

Spring is an ideal time to turn on your irrigation system and identify any obvious problems and repairs. Over the winter, sprinkler heads may have become tilted, sunken or clogged and these should all be repaired to optimize irrigation efficiency. Do a short test run through each zone on your system and locate those sprinkler heads that could use some adjustment. Also consider performing a distribution uniformity check to help refine your irrigation schedule.

Aeration/Cultivation

Spring 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 compaction and will encourage turfgrass growth and recovery.

Relevant USU Extension Fact Sheets

Northern Utah Turfgrass Management Calendar
- Recommended scheduling of turfgrass management practices

Southeast Utah Turfgrass Management Calendar

Southwest Utah Turfgrass Management Calendar

St. George, Area Utah Turfgrass Management Calendar

Snow Mold in Turfgrass

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