# 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**

During winter, most turfgrass diseases and insects are relatively inactive. However, there are still turfgrass management and pest concerns to be aware of, including the potential for winterkill and snow molds.

## Letter from the Editor

Dear Readers,

To say that the past couple of years have been challenging would be a gross understatement. In addition to working our way through a global pandemic, we have faced two of the driest and hottest years on record and that has brought some particular challenges for turfgrass managers.

For example, Utah's Department of Facilities Construction Management's (DFCM) grounds managers began addressing Executive Order 2010-10 which required all state agencies to follow the Utah Division of Water Resources weekly lawn watering guide. All DFCM facilities complied with the order, but there were still sprinklers running and green grass at state facilities, which presented a public relations challenge. In 2022, the state legislature passed H.B. 121, adding more robust guidance to the executive order and requiring state facilities to allow turfgrass to enter dormancy.

To meet the requirements of the new legislation, DFCM consulted with Utah State University's Center for Water Efficient Landscaping to develop irrigation guidelines for all state facilities. These guidelines were brought to governor's cabinet, received their approval, and the new requirements were issued to all delegated facilities falling under DFCM jurisdiction. In addition to the new irrigation requirements, all grounds supervisory staff of DFCM were required to complete training through the Qualified Water Efficient Landscaper program to learn how to evaluate their landscapes and irrigation systems for efficiency.

While these efforts are ongoing, Andrew Marr, Assistant Director of Facilities, DFCM, describes the Department's efforts as a progression of learning and implementation that is just beginning. "It's time to figure out our process and in the coming seasons our managers will know what to do," he says. "It's more about the buy-in, the common goal and common mission. It's hard to turn the ship around but (by) providing incentives and recognition…we're getting there."

This is just one example of how the state is working to address the drought and, hopefully, provides some inspiration to you as you manage your own turfgrass systems.

Wishing you all well,

Kelly Kopp, Editor, Turfgrass IPM Advisories
Extension Turfgrass Specialist
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# Turfgrass Winterkill

When turfgrasses die over the winter months, it may generally be described as "winterkill" (Fig. 1). The term covers a multitude of actual causes of turfgrass death in the winter, which may include snow mold, low temperatures, ice sheets, dessication and crown hydration.

### Crown Hydration

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

Of the commonly-used cool-season turfgrass species, annual bluegrass and creeping bentgrass are most susceptible to crown hydration, though annual bluegrass is the more susceptible of the two because it emerges from dormancy earlier.

### Dessication

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.

Figure 1. Winterkill symptoms in turfgrass.

Therefore, providing wind breaks and improving drainage may help reduce desiccation incidence.

### 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. Choosing more cold-tolerant turfgrass cultivars may help to avoid low-temperature kill.

### Ice Sheets

Ice sheets may also be identified as the cause of winterkill in turf. However, it is more often the cycle of crown hydration and refreezing that actually kills turf. This is an understandable mistake, since ice sheets may be created as snow melts and refreezes and they are very visible. Oftentimes, ice sheets will occur in low-lying or poorly drained areas where crown hydration may be facilitated because of the standing water. The damage closely aligns with the location of the ice sheet, causing confusion as to the actual cause of death (Fig. 2).

Figure 2. Areas that collect water may form ice sheets.

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

## Pink Snow Mold (*Microdochium nivale*)

*Favorable Conditions: cool (40-60°F) and moist conditions, neutral to alkaline soils, high nitrogen applications in the fall.*

Pink snow mold (PSM) can affect all cool-season turfgrasses, but damages bentgrass and annual bluegrass most severely. Snow cover is not necessary for PSM to occur, so it may be seen in the fall, but is more prevalent in the spring.

Where recurrence is severe, preventative fungicide applications may be made in the fall. Symptoms include well-defined, circular patch clusters and white-pink mycelium on infected leaf blades. Patches of dead, matted leaf blades may also be visible.

*Cultural Practices*

Recovery from PSM damage in the spring will be quicker if the area is raked and/or mowed to aerate the matted turf.

*Resistant Turfgrass Varieties*

Perennial ryegrass: Delray; Chewings fescue: Atlanta, Ruby; Red fescue: Dawson.

*Fungicide Options**

Tetrachloroisophthalonitrile (Daconil®), azoxystrobin (Heritage®), PCNB, or combination products (Instrata®).

## Gray Snow Mold (*Typhula incarnata*)

*Favorable conditions: cool (50-75°F) and moist conditions, shade, heavy thatch, high nitrogen applications in the fall.*

Gray snow mold (GSM) primarily affects tall fescue, bentgrass, and annual bluegrass. Circular patches of matted gray, tan, or white grass may range from a few inches to several feet in diameter. Pin head-sized black or rust-colored dots may also be seen on grass blades near patch edges.

*Cultural Practices*

Avoid heavy, late fall nitrogen applications. Improve air and soil movement and drainage. Remove excess thatch and prevent soil compaction with aeration. Rake and remove tree leaves from turf areas before snowfall.

*Resistant Turfgrass Varieties*

Kentucky bluegrass: Adelphi, Baron, Bonnieblue, Galaxie, Glade, and Monopoly. In general, the fine fescues are more resistant to GSM than Kentucky bluegrass and bentgrass.

*Fungicide Options**

Fungicides are rarely needed to control GSM. However, if the disease has occurred repeatedly in the same areas over a number of years, a fungicide may be warranted. Banner®, Bayleton®, Rubigan®, azoxystrobin (Heritage®), or PCNB.

# Measuring Predation in Turf with Artificial Prey

**Ever wonder exactly how much natural biological control happens in turf?** The truth is that it can be difficult to determine. Many insect predators are only active at night, and others hide during the day. They feed quickly on their prey and often leave no trace. Scientists are looking at ways to overcome the challenges of assessing predation in the field by using immobile, artificial insect prey.

The use of artificial prey—made from unscented and non-toxic modeling clay—goes back a few decades, but only recently has been used in turf. The technique is simple, inexpensive, does not require sophisticated equipment or procedures, and can be used in a wide range of situations.

The idea is that insect prey in the shape of caterpillars or other insects are replicated in clay. The prey is then glued to turf parts in a density similar to naturally-occurring prey, and left for a set period of time. Predators will mistake the clay for real prey, and the malleability of the clay shows the marks caused by predator's mouthparts. The artificial prey are collected from the field and predation can be determined using the counts of feeding sites on the clay.

**But which predators cause which feeding sites on the clay?** University of Georgia researchers are answering this question for the first time in turf settings. In a study led by entomology doctoral candidate Fawad Khan, they first documented how turf predators interact with the clay models. To do this, they placed individual predators collected from turf in a petri dish with an artificial larva and left them for 48 hours. They repeated this for 16 predator species. They then characterized the markings left behind by each type of predator, and found nine distinct impression types, such as scratches, pricks, detached segments, or dents.

Figure 1. In general, green caterpillars are perceived by predators as palatable and "safe". Shown here are impressions on clay caterpillar models after 48 hr in turfgrass, including: paired marks and scratches (top row); deep distortion and detached segments (middle row); and granulation, dents, elongated scratches (bottom row). Photo credit: Fawad Khan.

The researchers then tested various clay models in a turf field and found that the color of green or blue and the shape of a caterpillar were more attractive than other colors or shapes. They also found that larger clay models had more impressions than smaller models, regardless of shape. The next step is that the researchers will take their ideal models and put them to work in comparing predator activity between commercial turf (sod farms, golf courses) and residential lawns.

# Measuring Predation in Turf with Artificial Prey (cont'd)

**What does this mean for turf managers?** Right now, the use of clay models is more for research purposes and a practical application is well into the future. Clay models have helped scientists gain considerable knowledge on predator-prey interactions, abundance of predator species, effects of trait differences, and more. Eventually, the artificial prey may help to manipulate existing turf predator insects to serve as a control method for the pests, and reduce pesticide applications.

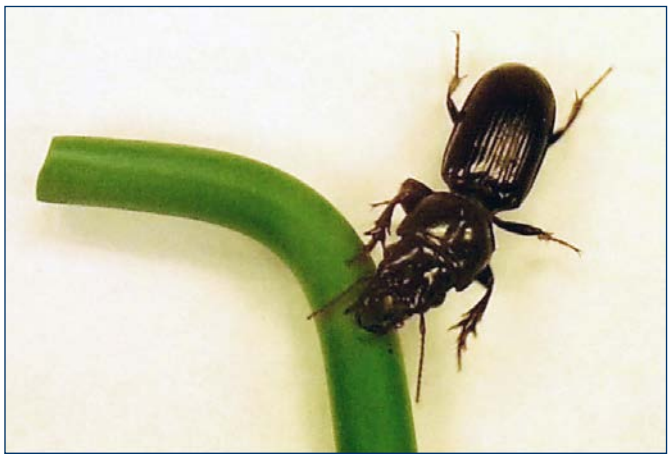

Figure 2. A predatory ground beetle interacting with the artificial prey. Photo credit: Fawad Khan.

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-Written and contributed by Marion Murray, USU IPM Project Leader & Utah Pests News Editor

# Water Well with CWEL Webinar Series

USU's Center for Water Efficient Landscaping hosts monthly webinars on topics related to landscape water use and conservation, including turfgrass topics!

On November 8th, join hosts Candace Schaible and Shital Poudyal for a conversation with Rick Maloy, Water Conservation Manager at Central Utah Water Conservancy District. Rick will present: Growing Responsibly: Accommodating Population Growth through Rebate Programs and Model Ordinances.




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