Management Forum: Turf Experts Respond to Your Questions

This month's topics cover spring fertilization and summer bentgrass decline, unseasonably dry weather in the Southeast and its effect on insects and two kinds of snow mold. If you have difficult problems in the turf you manage, send your questions to the Forum

Editor's note: *Management Forum is a new feature of TurfGrass Trends. We've assembled a team of five well known and respected turf experts to answer your questions on turfgrass-related problems. Our team includes:*

- *Dr. Richard Hull*
  Plant Physiology, University of Rhode Island
- *Dr. Karl Danneberger,*
  Agronomy, The Ohio State University
- *Dr. Noel Jackson*
  Plant Pathology, University of Rhode Island
- *Dr. Joe Neal*
  Weed Science, North Carolina State University
- *Dr. Rick Brandenburg*
  Insects, North Carolina State University

The format for each Management Forum will include one or two questions and the appropriate expert's response. Each of our Forum members has a special area of expertise: insects, disease, weeds, general agronomy or plant physiology. We forward questions to them for a speedy response.

If you have specific concerns or problems relating to the turf you manage, don't hesitate to send your question along to Curt Harler, managing editor at curt@curt-harler.com, call 440/238-4556 or fax 440/238-4116. We'll publish our experts' suggestions as promptly as possible

Spring fertilization and bentgrass summer decline

Q: Can spring fertilization practices exacerbate summer bentgrass decline problems and if so, what are the ways to avoid increasing decline problems?

A: Dr. Dick Hull, University of Rhode Island, responds: Yes, fertilization,

especially in the spring, can contribute to summer decline of bentgrass turf. Exactly why and how to avoid this problem is not so easy to answer. The problem is knowing exactly what causes summer decline in cool-season grasses and if it is always the same thing (see TGT vol. 8, no. 10, pgs. 1 to 7). Current research at several universities is addressing this problem and more useful information will be available soon.

Turf needs adequate nitrogen supplies in order to respond positively to summer stress and repair injury resulting from play. Balancing these requirements is the challenge of sound management.

Cool-season grasses are placed under considerable stress by the high temperatures of mid-summer. This is further aggravated by management stresses such as close mowing, foot traffic and possibly aerification.

Much of this cannot be avoided so spring management should be directed toward preparing the turf to enter the summer season in the best physiological condition possible. That includes a deep root system, generous carbohydrate (energy) reserves and freedom from disease.

Unseasonably dry weather like that experienced in the Southeast can encourage certain insects like chinch bugs. Treated and untreated plots show how much damage they can cause.

Nitrogen can influence all three of these physiological conditions. High levels of available nitrogen will stimulate shoot growth but decrease root growth. Also, high nitrogen levels will decrease carbohydrate reserves and, if the climate is suitable, will tend to encourage 'high fertility' diseases.

However, turf needs adequate nitrogen supplies in order to respond positively to summer stress and repair injury resulting from play. Balancing these two sets of requirements is the challenge of sound management.

No two situations are exactly the same so it is dangerous to make blanket recommendations. What follows are my best suggestions:

1. Apply nitrogen early in the spring before it will stimulate rapid shoot growth. The nitrogen will be absorbed by the grass but more will be diverted to stimulating root growth and some will be stored as protein. This nitrogen will have little negative impact on carbohydrate reserves and may even increase their storage capacity. If an early nitrogen application was missed or the grass shows signs of limited nitrogen, an application of a slow-release material later in the spring should be helpful and cause little harm.

2. A modest application of potassium and calcium will also be beneficial. These nutrients will make the grass more responsive to stress conditions including the assault by pathogenic fungi. Because summer decline is partially due to the damaging action of toxic oxygen radicals, those nutrients required to detoxify these radicals must be available.

3. Iron is the most important such nutrient but copper, manganese and zinc are also involved. A light foliar application of these micronutrients just prior to the onset of hot weather and periodically throughout the summer will insure their availability.

These nutrients are likely to be limiting if bentgrass is growing on a sand-based green to which no micronutrients have been added. Even a soil-based green from which clippings have been removed for

many years will likely be limiting in some micronutrients. Topdressing materials can be supplemented with these nutrients and that is an effective means of application.

Other management variables can be adjusted to minimize summer decline. These include raising the mowing height, maintaining a well watered soil/sand profile to promote deep root growth, maintaining good air movement over the green and minimizing the time when there is free water on the grass. Summer stress cannot be prevented but careful fertility management can help minimize turfgrass decline.

Unseasonably dry Southeast and its effect on insect damage

Q: How much of a role do unseasonably dry soil conditions in spring — like those that are occurring this year in the Southeast — play later in turf-damaging insect activity?

A: Dr. Rick Brandenburg, North Carolina State University, replies: Dry weather in the spring can affect turfgrass insect damage in several ways. There can be a short-term effect in which the dry conditions enhance the effects of the insect feeding, simply due to the fact that the drought is providing an additional stress to the plant.

Turfgrass damaged by white grubs will show much more serious symptoms of injury if the grass is under drought conditions. Dry weather will usually slow turfgrass recovery once the pests have been controlled.

This can be true for surface feeding pests such as armyworms as well. Dry weather may increase the chance of seeing armyworms on highly managed turfgrass since the armyworms will "move" from areas where the grass is dry from the drought into lush, green irrigated areas.

Some pests, such as bermudagrass mites and southern chinch bugs, usually are more severe during hot dry conditions. The rapid increase of their populations is enhanced under such conditions and the interaction of the pest and the weather often has devastating effects on the turfgrass.

In a few instances, dry weather may reduce the likelihood of a pest problem. This would be true in the case of black cutworms.

Long-term effects of dry weather may result in a reduction in certain pests such as mole crickets or white grubs. This is because the adults prefer to lay eggs in areas with adequate soil moisture to ensure egg viability and hatch. Dry soils often result in eggs that desiccate and, as a result, potential insect problems never materialize.

These are general observations and such trends, while valuable in planning, are not a substitute for a good monitoring program of the turfgrass.

Both gray snow mold and pink snow mold can severely disfigure turf stands of cool-season grasses.

Gray snow mold vs. pink snow mold

Q: How can I differentiate between gray snow mold (GSM) and pink snow mold (PSM) damage and what should I do to help the turf recover if I have either disease?

A: Dr. Noel Jackson, University of Rhode Island, recommends: Both GSM and PSM can severely disfigure turf stands of cool-season grasses. Symptoms of the diseases are apparent at snow melt especially after long periods of persistent, deep snow cover. Snow accumulating over unfrozen ground offers ideal conditions for these psychrophilic (cold tolerant) fungi to take advantage of the dormant turf and generate the typical symptoms. Yellow to bleached, collapsed grass plants in patches from 1 to 2 inches up to 1 to 2 feet mark the infection sites. Patches may coalesce to involve large areas of turf.

Close mown stands of bentgrasses, bluegrasses, fescues and perennial ryegrasses on greens tees and fairways are particularly vulnerable, but all kinds of sports turf and lawns can support infections by these fungi.

The names imply that color differences (in mycelium and/or colonized plant tissues) may be used to differentiate between these snow molds but often such visual dis-

tinctions are hard to assess. Positive identification of the causal agents, Typhula spp. (GSM) and Microdochium nivale (PSM), is reliably determined by examination for the resting structures of GSM (visible with a hand lens or naked eye) and for the asexual fruiting structures and spores of PSM (visible with a hand lens and microscope respectively).

GSM resting structures (sclerotia) are rounded, reddish brown to black masses of densely compacted mycelium ranging in size commonly between 0.5-2 mm diameter. They form on or in the collapsed plant tissues and serve to carry these fungi through the season into the late fall when active growth resumes.

Pink snow mold has the capacity to continue activity without snow cover — provided weather conditions remain cool and wet. Existing patches may continue to increase in size and spore inoculum from these sites may spread.

Collapsed plant tissues of PSM often have a pinkish coloration. Examination of such material with a hand lens may reveal the cream to orange-colored slimy pustules (sporodochia) of M. nivale. Transfer of a small sample from the sporodochium to a water drop on a glass slide and viewed through a compound microscope will readily demonstrate a profusion of the characteristically small, banana-shaped spores.

By snow melt, GSM activity ceases. No fun-gicide treatment is necessary at this time but the dormant sclerotia remain in the thatch layer. Generally, GSM damage is confined to the leaf blades and sheaths, the crowns remaining viable so natural but delayed recovery of the turf will occur. Light scarifying to remove crusted leaf debris followed by judicious topdressing and/or fertilizer application will enhance the recovery process.

In contrast, PSM has the capacity to continue activity without snow cover — provided weather conditions remain cool and wet. Existing patches may continue to increase in size and spore inoculum from these sites will be tracked to initiate new infections.

The spring phase of the disease, commonly referred to as Microdochium (Fusarium) Patch (M/FP), can reach epidemic proportions and, depending on location and weather conditions, continue activity as late as June.

Cool, wet weather in late summer and fall is also very conducive to M/FP outbreaks, particularly on Poa annua and bentgrass turf that is lush and succulent from excessive nitrogen fertilization. If not treated at that time, existing MF/P patch symptoms may then be subject to early snow cover, setting the stage for severe PSM damage over the winter.

Microdochium nivale is usually a much more damaging pathogen resulting in death of most crowns and allowing little recovery growth. Thus, treatment with a fungicide at snow melt for PSM infected turf is strongly recommended to prevent any extended spring activity in the MFP phase. Depending on weather conditions, repeat fungicide applications may be necessary.

Dicarboximide, benzimidazole, DMI or strobilurin fungicides all offer good control. Quintozene, a common fall-applied preventive material, should not be used in spring if temperatures of 65-70 degrees Fahrenheit are anticipated since phytotoxicity to bentgrass turf is possible with this material.