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## importance of infrastructure

(continued from page 10)

While mowing reduction is beneficial on golf course turf, PGRs also offer other benefits, including a reduction in water use rates, increased wear tolerance, increased rooting, reduction in disease pressure, increased visual turf quality, and an increased rate of recovery from injury.

While this list is impressive, each of the above responses will depend upon a number of other factors and may not always be observed. For instance, a study was conducted by the author at Michigan State University that examined the effects of PGRs on turfgrass wear tolerance. Using Primo at a rate of .25 oz/M, significant effects on turf wear tolerance were observed. At an annual nitrogen fertilization rate of 2.5 lbs N/M/Yr, treatment with Primo significantly improved creeping bentgrass wear tolerance.

At a higher rate of N fertilization, 5 lbs N/M/Yr, the improvement in wear tolerance was noticeable but not nearly as pronounced as at the lower level of N fertilization. Thus, other cultural practices will impact the performance and results obtained with PGRs.

The same study at Michigan State University also examined the effect of PGRs on divot recovery. Simulated divots were made in PGR-treated turf and the rate of divot closure monitored until the divots had completely recovered. We had assumed that PGRs would slow the rate of divot recovery because of the reduction in growth observed with PGRs. However, this did not happen to any extent with the PGRs tested. The most important factor, as one might have guessed, was the rate of N fertilization. Divots healed about ten to eleven days faster when fertilized at the high N rate (5 lbs N/M/Yr) than when fertil-

ized at the low N rate (2.5 lbs N/M/Yr). PGRs had a much less dramatic impact than N fertilization on the rate of divot closure.

In 1994 none of the PGRs tested (Primo, Cutless, Scott's Turf Enhancer) had a significant impact on divot closure rates, i.e., they were no different than untreated turf. In 1995, Primo treated turf recovered at the same rate as untreated turf. However, higher rates of Cutless and Scott's Turf Enhancer resulted in slower divot closure rates than turf receiving no PGR.

Much remains to be learned about the responses of high-maintenance turf to PGRs. However, it seems clear that these products will continue to be used by golf turf managers to manage growth and improve turf quality and performance. ■



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# Weather Effects Upon Trees

*Rex Bastian, Ph.D.  
Hendricksen, the Care of Trees*

**T**his year, we observed a great deal of injury to trees and shrubs that occurred over the winter. This injury was apparent in many forms. Twig dieback, leaf tattering, and thin foliage are some of the more mild effects. At the other extreme, many trees did not leaf out at all, or leafed out very slowly.

Just exactly what transpired to cause all of the different symptoms is not clear. It is likely that several different factors interacted to produce the variable symptoms we observed.

In areas where excessively cold temperatures occurred during the winter, marginally hardy species were affected. In the Chicago area, redbuds and saucer magnolias were injured by the cold temperatures.

More puzzling was the number of ash, honeylocust and Norway maples which didn't leaf out this spring. While the temperatures were cold, they shouldn't have been cold enough to freeze the plant. In fact, the twigs and buds of many of the trees were still green. Still, they did not leaf out. What happened?

It appears that the root systems of many of these trees were damaged during the winter. Inspection of many trees showed that while the twigs, buds, and stems were green, the roots were brown or drying out.

Root tissues are actually more susceptible to cold injury than are the above-ground tissues. Usually, however, the roots are protected and insulated by the soil. This past winter, where tem-

peratures were cold and snow cover limited, environmental conditions must have been correct for root death to occur.

Many damaged trees were located on berms, parking islands, or other areas with raised or limited root areas. Exposing roots to temperature extremes increases the likelihood of injury. In addition, many landscape trees are grafted. Tissues of a named cultivar are inserted onto a seedling understock in the nursery. The cold tolerances of the understocks can vary widely. Also, plants that were grafted in warmer regions of the country and then installed in colder regions often encounter root damage because their root systems may not be hardy.

Only time will tell if root damaged trees will recover or not. Trees that were slow to leaf out will be very susceptible to hot, dry winds should they occur during the summer. Mulching will help these trees maintain soil moisture while the root systems recover. Trees where the root systems were totally lost typically show the following symptoms: 1) the twigs will begin to shrivel, wrinkle, and crack as they dry out (they may remain a light shade of green for awhile); 2) the roots will be brown beneath the bark and will appear very dry; 3) the stems will lose their green color, fading through a light green and take on a brown or dark appearance; 4) fungal pathogens will take advantage of the dying tissues, forming cankers on the twigs.

Then, along with the cold injury, we were hit with about six weeks of dry weather in June and early July. Trees that were already struggling with root related problems took it on the chin again. Where root systems were still functioning, but failing, we saw droop-

ing foliage, partial wilting, or scorching of the crown. In some cases, the root systems suddenly died, causing rapid browning of the entire tree or shrub. We observed many sugar maples suddenly failing in this manner. An eight-inch diameter sycamore on my own property failed during late June. It weakly leafed out this spring, and suddenly, what foliage was present wilted and turned brown within a few days. The root system just gave up. Inspection of the root system revealed brown roots with the outer covering falling off. I cannot explain why this tree failed. The other trees on my property came through the winter in fine shape. Why this particular tree? Often, we never find a suitable answer.

How do we try to prevent this type of injury to our trees? How do we treat the trees already struggling? There are no silver bullets. Preventive cultural practices are our best bet. Mulching and watering is the best recommendation for such trees. Watering will help keep the soil moist. Mulching will help conserve the soil moisture present by reducing soil temperatures and water loss from the turf. It will also provide the best environment possible for new roots to form to replace those lost. A light fertilization will be of benefit in the fall.

Even if we do all these things, we should be aware that water can be lost faster than it can be replaced by the damaged root system. In such cases, foliage injury can continue even though water is being provided. Environmental conditions through next spring will have a major impact on how our trees can recover. ■

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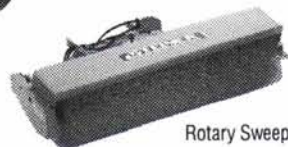
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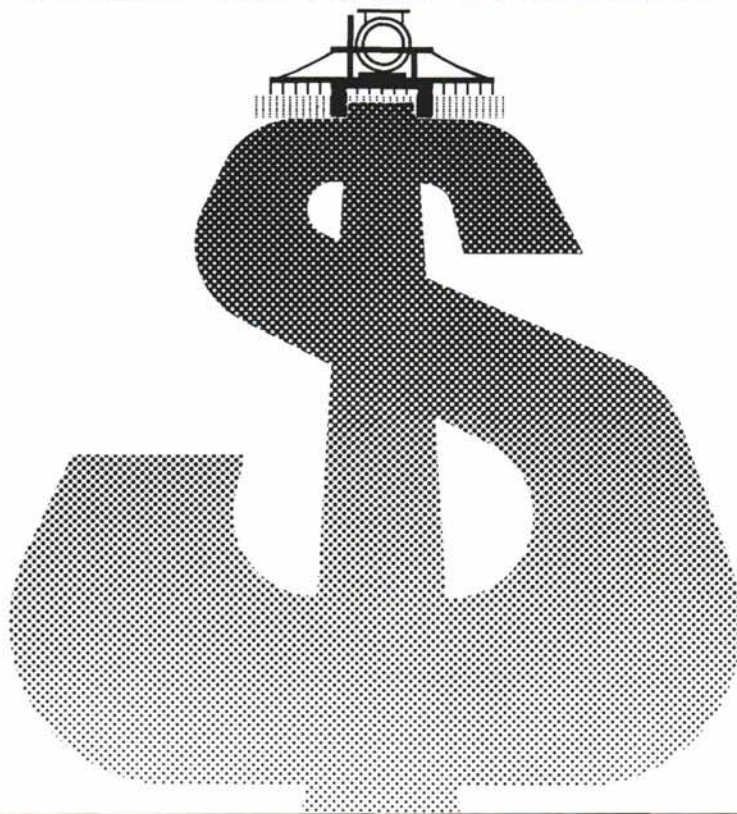
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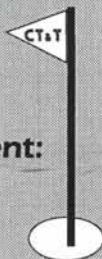
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# Did NTEP Survive and Why Should I Care?

Tom Fermanian and Tom Voigt  
University of Illinois

The summer weather that we all dread, didn't come this year: nighttime temperatures above 75° and humidity that remains high both day and night. The general stress level on turf, including pest problems, wear, and drought, often accelerates over the end of summer and early fall.

We're certain with all of these pressures, you and just about all of your other fellow superintendents have wondered when there will be a grass that resists all of the above-mentioned problems while growing perfectly in spring, summer, and fall. Unfortunately, we not only have not found this species and/or variety, but probably never will. However, many of the advances made each year to provide better turf are due to long-term work conducted by turfgrass breeders at universities and in the seed industry and from the careful attention turf managers pay to the superior performance of selected patches of turf on their courses. Many of the advanced cultivars that we use in championship-caliber turf were selected initially by a superintendent from a challenging spot on a golf course. This material was then transformed into a named variety through continued breeding and selection. One of the steps in this process is the evaluation of potential varieties in unbiased nationally-based tests.

The National Turfgrass Evaluation Program (NTEP) — what is it? The NTEP was established in 1980 to organize and promote the uniform evaluation

of new and currently available turfgrass varieties in a systematic way. Initially, only cool season species were evaluated. Each selected species was evaluated at multiple university sites over a four- or five-year cycle. For the

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*Many of the advanced cultivars that we use in championship-caliber turf were selected initially by a superintendent from a challenging spot on a golf course.*

---

first ten years of the program, the work went on without notice and little fanfare. Recently, with a greater emphasis on using genetic resistance as a primary mechanism for increasing turf quality, cultivar evaluation has gained stature. Likewise, the NTEP program has evolved greatly.

How have NTEP activities changed? This evolution has resulted in a program that systematically evaluates both new and old cultivars of at least nine turfgrass species. For each evaluation, the initial step is to solicit the seed industry for cultivar entries. Each entered material requires a sufficient quantity of seed for all of the selected evaluation sites with a small surplus. This alone often limits the number of entries. Each entry costs the seed producer \$6,000. These funds are used to support the evaluation experiments established at universities across the country. Each university evaluator is paid \$6,000 over the course of the four-year evaluation period for each trial, generally, one per state. This support is only continued if appropriate data is collected and submitted to the NTEP. Since many of the cool season species evaluation trials have a large number of entries, sometimes over 100, there is sufficient funding for many species evaluations to be self-supporting.

(continued on page 24)



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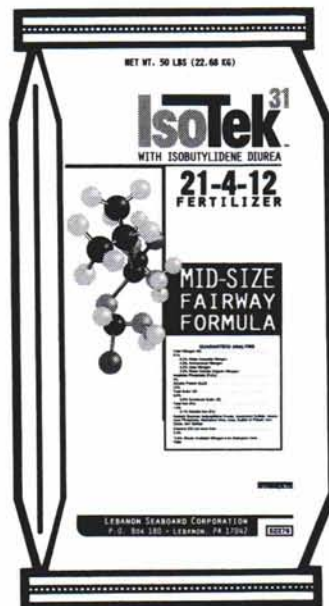
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# the Bull Sheet

## DATES TO REMEMBER

September 16 — MAGCS monthly meeting at Skokie C.C.

October 1 — ITF Golf Day at Schaumburg G.C. and Poplar Creek G.C.

October 8 — MAGCS monthly meeting at Bryn Mawr C.C.

November 7 — MAGCS Clinic and Annual Meeting at Butterfield C.C.

November 12-14 — Penn State Turf Conference at State College, PA.

November 19-21 — Three-day Turfgrass and Ornamental Seminar at Purdue.

December 2-4 — NCTE at Pheasant Run Resort & Golf.

Good old Chicago weather. This year, we had our spring in July! July posted only one day in the 90s, and all of the nights have been in the 60s or even the 50s. July was one of the coolest since 1873, when records were first tracked. July also proved to be wet. Just ask southern DuPage County late in the month when it received 8 to 16 inches of rain in 24 hours.

Lori Matthews is currently seeking a horticultural position with a semi-private or private golf course. Home phone after 6 p.m., 847-465-8123.

The heavy rains were especially hard on Prestbury G. C. where Dave Meyer states that the course may not be opened for the rest of the year. There were 8 to 12 feet of water covering most of the course. All of his equipment was under water, and all irrigation controls and pumps and motors were ruined. There was a foot and a half of water in the clubhouse first floor; and the basement was totally flooded which, of course, ruined everything there. Seven greens are totally dead, not to mention all of the roughs, tees and fairways.

With the extent of damage that many other clubs also experienced, I think the MAGCS could be of assistance by forming a support committee to help in times of need—times brought on by severe weather such as flooding, tornadoes, fire, etc. A call to someone on such a committee could set in motion, via a telephone tree, needed help to the distressed superintendent. I know that a few equipment suppliers came to the aid of Dave Meyer, but I also think that many superintendents would also be able to help with a piece of equipment or two, or maybe even supplying some manpower for a short period of time.

The Rolling Green C.C. won the John Deere golf tournament which was held at Bull Valley G.C. on July 22. The tournament was sponsored by John Deere and J. W. Turf, Inc. There were 43 teams competing to go on to the 10th Annual John Deere Team Championship

Golf Tournament to be held at the Pelican Hill G.C., Newport Coast, CA, November 14-17. The winning team consisted of Larry Chirico, superintendent; John Schickling, PGA professional; Eric Powell, club manager; and Ben Trapani, club president.

For Sale: 1990 Lesco 500D with 8-blade HD cutting units, only 1,100 hours, two spare cutting units—\$2,000. Contact Kurt at Exmoor C.C., 847-433-1177.

September is here, and so is all of the reseeding that takes place at this time of the year. The Musser Foundation is collecting Blue Tags from the seed bags. Each tag of the following varieties and blends will be worth 50 cents when turned in to Mike Bavier, Dudley Smith, or Fred Opperman.

**TALL FESCUE:** Olympic, Apache, Bonanza, Monarch, Tomahawk, Silverado, Eldorado, Triathalawn Blend, Confederate Blend.

**PERENNIAL RYEGRASS:** Citation II, Sunrye (246), Birdie II, CBS II Blend, Navajo, Manhattan II, Charger, Alliance Blend.

**FINE FESCUE:** Shadow, Fortress, Shademaster, Bighorn Sheeps Fescue.

**KENTUCKY BLUEGRASS:** Columbia, Midnight, 4 Aces, Challenger, Blackburg, Voyager, Unique.

**CREeping BENTGRASS:** Penncross, Pennagle, Pennlinks, Pennway Blend, PennTrio Blend, all of the A varieties.

**HARD FESCUE:** Aurora and the Bloomers Wildflower Mix.

If in doubt, save the Blue Tag anyway and turn it in.

“Maximizing Turfgrass Disease Control,” taught by Dr. Houston Couch, will take place on September 13 at Eagle Ridge Inn and Resort. Call 800-472-7878 to register.

A public acknowledgment from Ken Lapp, superintendent, Cog Hill C.C.:

(continued on page 28)