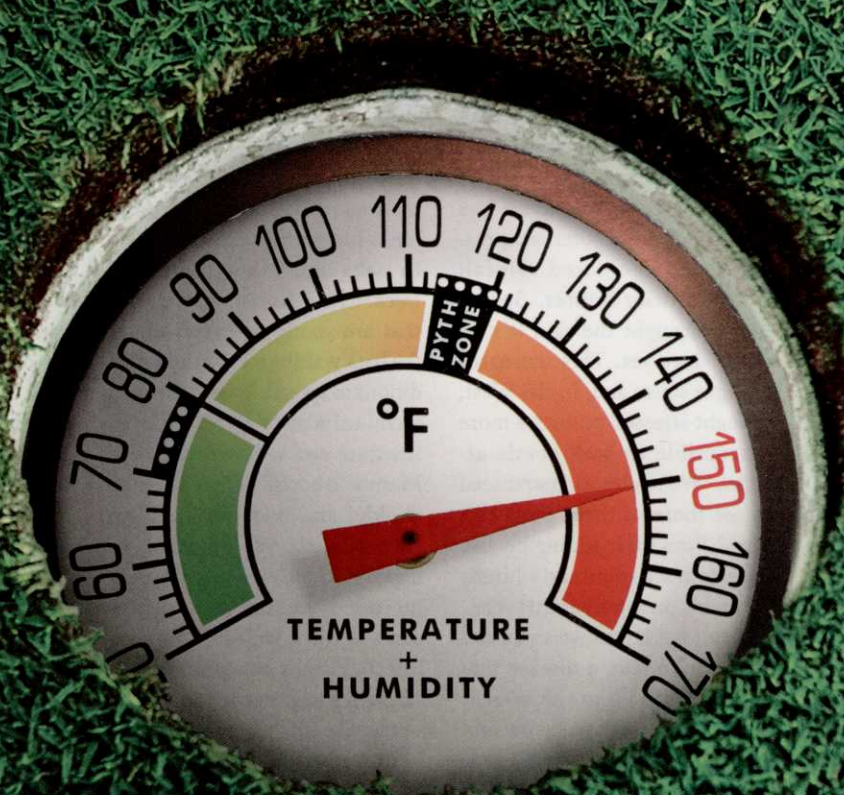


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When trees aren't stressed, they're able to fend off decay, insects and disease – under stress, defense becomes much tougher.

year, according to calculations by the National Oceanic and Atmospheric Administration.

Unusual weather stresses trees, making them susceptible to disease and insect pressure.

A warm winter followed by a warm spring seems to have resulted in earlier insect emergence in many regions. Overwintering and migrating insects appeared earlier, creating time for possibly more insect generations and larger populations. "There is a synchronized life cycle between plants and pests.

Once spring hits, there is a flush of new growth, so a rush of opportunistic pests gravitate toward plants during this time to go after new leaves and blossoms," says Anand Persad, an entomologist and technical advisor with The Davey Institute. "New growth is susceptible because plants must build up their immunities to pests over time, and



New growth is especially attractive to insects.

newly planted trees, specifically, have not had time to do so."

Each region of the country encounters different plant challenges based on their specific weather patterns.

On the West Coast, Bova says 5- to 10-degree cooler temperatures and decreased rainfall meant a drier winter. Spring hasn't brought the rain it normally does yet. This increases drought stress and, in the West, drought-stressed pines are more susceptible to bark beetle attacks. "We're almost guaranteed to see more of these pests this year," Bova says, adding he also expects to see aphid and whitefly problems on ash trees this year.

As temperatures warm up and rains arrive late, a disease that tends to crop up in the West is anthracnose on sycamore and ash trees. "This disease turns leaves brown as they try to leaf out, delaying full leaf out until June when they would normally leaf out in April," Bova says, adding that better air circulation between tree and shrub plantings can help limit this disease.

In Florida and Texas, the situation is the same with warmer temperatures coming earlier without the normal rainfall. "Florida's spring came three weeks early, and it's been abnormally dry, which has brought a lot of plant wilting," Schlick says. "The mois-

ture is being sucked out of the ground, and the drought is stressing plants. As trees continue to stress, insects could get the upper hand on them."

In Texas, drought-stressed trees are suffering from hypoxylon, a fungus that causes cankers in oaks and other hardwood trees. "This disease infests oaks that are young and stays under the bark waiting for the right conditions to spread," says A.D. Ali, a technical advisor with The Davey Institute and a Board Certified Master Arborist. "Once the tree is older and under stress from root disturbance or drought, hypoxylon kicks in and there is no cure. If you catch it early you can see the powdery spores on infected limbs and prune them off to try to prevent the spread of the disease."

In transition zone areas like North Carolina, Ali expects Eastern tent caterpillar, bagworms and Japanese beetles to arrive early and be more abundant.

In the Northeast, spring is two to three weeks early and there has also been a rainfall deficit, says Mike Cook, an ISA Certified Arborist with The Care of Trees, who takes care of trees on more than 15 golf courses in the Northeast. Cook has seen pine saw fly out early this year, and he also expects boxwood leafminer to be a problem.

Leaf diseases also seem to be troubling apple and crabapple trees this year in the Northeast, particularly apple scab and cedar apple rust. "If superintendents weren't out at the beginning of April with a preventive fungicide application to keep the trees looking good, they missed their window this year because it came early," Cook says, adding that a lot of treatment windows will have to be adjusted to reflect the earlier season.

And in the Midwest, spring came three to four weeks early, meaning some flowering plants were blooming at the end of March when they usually don't bloom until early May, points out Grant Jones, a technical advisor with The Davey Institute.

Compared to last year's exceedingly wet spring in the Midwest, this year has been drier. In some ways, this is good news, Jones says. "Last year, the wet weather meant a lot more disease infection, like apple scab and cedar apple rust," he says. "A lot of those disease spores are still on the leaves. More spores usually mean more disease pressure. But there hasn't been a lot of rainfall, so the conditions haven't been favorable for disease to develop yet. While there is a lot of disease in the environment, whether it becomes a bad year depends on how much moisture we get."

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Last year's wet spring made conditions favorable for many tree diseases to flourish.

Part of the uncertainty of predicting how this will affect plants this year comes from not knowing if these temperatures will continue or what the rainfall pattern will be like. For instance, if warm temperatures persist and moist weather conditions follow, diseases could show up earlier and more widespread than in previous years.

MONITORING IS A MUST. Because weather patterns are unusual this year, golf course superintendents need to be more mindful of the condition of their trees and shrubs. Davey professionals encourage early and persistent scouting to spot early signs of disease or insect infestation.

Additionally, golf course superintendents should avoid placing any additional stress on their trees and shrubs.

"Stress is like a catalyst to lurking problems," Cook says. "We're already expecting to see more stress. And it's important to monitor how this year's weather affects trees. For instance, if trees leaf out and are experiencing a lack of moisture in the ground, it can't be helpful for root systems and the growth of those trees. We may have stunted growth this year on some trees or trees that begin to decline as a result of stress."

Stress comes in many forms. On the West Coast, Bova sees salt accumulation around golf course trees that are being watered with recycled or nonpotable water. While the practice is sound for increased sustainability, higher salt accumulation in trees, which tends to happen during years when there isn't

enough fresh rainwater to wash the salt away, can inhibit trees' nutrient uptake.

Golf course trees that are pruned improperly or are wounded from extreme weather, like the early, damaging winter snowstorm that impacted the Northeast in October of 2011, could also be susceptible to increased insect and disease pressure. "Trees are still recovering and trying to survive, so that might give secondary pests and diseases a foothold into the tree," Cook says.

Limbs that do not heal properly or trunks that are damaged from equipment can lead to the increase in decay and the presence of sulfur fungus that we are seeing in the West. Decay can spread and lead to branch or root rot and, ultimately, a potential safety issue if the tree isn't able to compartmentalize that decay from spreading. "By the time you're seeing conks on the tree, it's likely you have significant decay," Bova says.

Ensuring broken branches are properly pruned in these situations so trees can heal can help limit these problems.

Ali jokes about another situation he calls golfer canker, where golfers accidentally hit their balls into tree trunks, creating a trunk deformity and a place for tree decay to grow. "Unfortunately," he says, laughing, "the only cure for that is for players to improve their level of play." **GCI**

Nicole Wisniewski is a senior project manager with The Davey Tree Expert Company, Kent, Ohio.

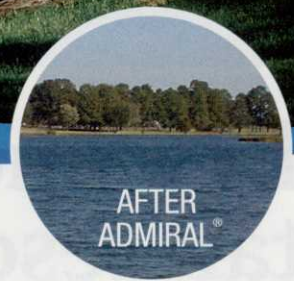

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Patches of bermudagrass in tall fescue and zoysiagrass are easily identified by differences in color and leaf texture (above, dormant bermudagrass in a tall fescue lawn).



Bermudagrass control in tall fescue and zoysiagrass

In situations where Bermudagrass covers a large percentage of a given turfgrass area, complete renovation should be considered over selective removal.

By Greg Breeden, James T. Brosnan, Thomas J. Samples

Bermudagrass (*Cynodon spp*) is commonly selected for use on Tennessee athletic fields and golf courses for its aggressive growth (providing fast recovery from wear and tear) and tolerances to heat, drought and traffic stress. These same characteristics, however, also render Bermudagrass an extremely difficult-to-control weed in tall fescue (*Festuca arundinacea*) and zoysiagrass (*Zoysia spp.*) stands.

Infestations of Bermudagrass in tall fescue and zoysiagrass commonly take the shape of distinct patches, easily identified by differences in color (during periods of active growth and

dormancy) and leaf texture. In zoysiagrass turf, differences in morning dew patterns also help identify areas of Bermudagrass contamination. Bermudagrass will invade any area of a tall fescue or zoysiagrass stand that has been weakened by diseases, insects, other types of weed competition or any type of stress.

BERMUDAGRASS GROWTH AND IDENTIFICATION. Bermudagrass is a mat-forming perennial grassy weed that aggressively spreads by both rhizomes and stolons. This extensive network of below- (rhizomes) and above-ground (stolons) vegetative

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Bermudagrass has a hairy ligule.

Bermudagrass seedheads have three to seven spikelets.



propagules makes bermudagrass extremely difficult to control. In many instances, bermudagrass can be desiccated on the soil surface with certain herbicide applications, only to regenerate over time from below-ground rhizomes. Additionally, aggressive above-ground growth from stolons allows bermudagrass to advance into additional areas of desirable turf.

Bermudagrass can be misidentified as other grassy weeds. For example, similarities in leaf texture often cause many to wrongly identify Bermudagrass populations as nimblewill (*Muhlenbergia shreberi*).

However, Bermudagrass has a hairy ligule, while the ligule of nimblewill is membranous. Bermudagrass also has a deeper root system than nimblewill and persists in drier, sunnier environments.

Bermudagrass can also be confused with zoysiagrass; however, zoysiagrass leaves are rolled in the bud and often have hairs along the leaf blade, while bermudagrass has a folded veneration and has no hairs on the leaf blade. Bermudagrass seedheads have three to seven spikelets, which can be 1 inch to 2 inches long.

CULTURAL PRACTICES TO PREVENT BERMUDAGRASS INFESTATIONS.

The best method of preventing Bermudagrass infestations is to maintain a healthy, dense turf. Implementing the proper cultural practices required to maintain tall fescue and zoysiagrass turf will reduce the likelihood of Bermudagrass encroachment. For information on the proper cultural practices used to maintain tall fescue and zoysiagrass turf in Tennessee, see UT Extension publication PB1038, Lawn Fertilization and Management. Additional information can also be found at <http://tennesseeturf.utk.edu>.

Additional tactics, including the following, can be taken to discourage Bermudagrass encroachment and spread in tall fescue and zoysiagrass.

Inspect all new materials. Inspect all soil, compost, plant material and seed brought onto a property to be sure that they are free of Bermudagrass. Pay special attention to ensure that no vegetative structures (rhizomes or stolons) are present in these materials.

Increase mowing heights when possible. Increasing the canopy height will improve the rooting and photosynthesis of the desirable turf, resulting in a healthier stand that is less susceptible to Bermudagrass encroachment. Additionally, the taller canopy will shade any Bermudagrass present in the stand, which will reduce its ability to spread.

Maintain proper fertility. For tall fescue, fertilize two times annually, once in the spring and once in the fall. Always avoid fertilizing tall fescue during the summer. For zoysiagrass, fertilize during the summer to deliver less than 3 lbs. nitrogen/M/year. Zoysiagrasses have lower nitrogen requirements than Bermudagrass. Thus, fertilizing at the proper rate will maintain adequate density while reducing the likelihood of Bermudagrass encroachment and discouraging the spread of any Bermudagrass present in the stand.

Water deeply and infrequently. Irrigate to a depth of about 6 inches, approximately twice a week. Shallow, frequent irrigation favors Bermudagrass.

Pay attention to flower beds and other landscaped areas. Keep these areas free of Bermudagrass contamination. Use heavy mulch or deep edging to keep Bermudagrass from establishing. Edging material should

be at least 6 inches into the soil.

HERBICIDE OPTIONS FOR BERMUDAGRASS CONTROL. There are limited herbicide options for controlling Bermudagrass in tall fescue and zoysiagrass. Be aware that if the applications are successful, numerous voids (bare areas) will be left in the turf canopy after Bermudagrass has been removed. These voids will be susceptible to future weed infestations and should be re-seeded with a high-quality turfgrass cultivar. Check the herbicide label for information regarding the time required between seeding and applying a herbicide.

In many instances, a single application of the herbicides listed below will cause severe Bermudagrass injury, causing a void to develop in the canopy; however, Bermudagrass can usually grow out of this injury over time. Thus, multiple herbicide applications and proper cultural implementations will be required to achieve complete control.

OPTION NO. 1 — FUSILADE II FLUAZIFOP PROGRAM.

Make sequential applications of Fusilade II at 3–6 oz./acre + Turflon Ester at 32 oz./acre, on 4-week intervals, for Bermudagrass control in tall fescue and zoysiagrass turf. Sequential applications of fluzifop are labeled for Bermudagrass control in tall fescue and zoysiagrass. Research has shown that tank-mixing fluzifop with triclopyr will improve weed control efficacy and reduce undesirable turf injury. Do not apply Fusilade II applications when the desired turfgrass is under any type of stress, due to the increased potential for herbicide injury.

Recent research at The University of Tennessee has found that Bermudagrass is most susceptible to these treatments when transitioning into winter dormancy in fall and in spring once green tissue is present. Often the process of transitioning into winter dormancy can begin before visual signs of the transition (i.e., changes in turf color) are apparent. We've observed that applications of fluzifop + triclopyr are most effective once the average daily air temperature falls below 72F. These applications treatments will need to be applied throughout multiple growing seasons to obtain complete control.

OPTION NO. 2 — ACCLAIM EXTRAFENOXAPROP PROGRAM. Sequential applications of Acclaim Extra at 20–28 oz./acre fenoxaprop

+ Turflon Ester triclopyrat 32 oz./acre, on 4-week intervals, are labeled for Bermudagrass suppression in tall fescue and zoysiagrass turf. Research at The University of Tennessee has observed that programs incorporating Acclaim Extra fenoxaprop tend to be less effective than those delivering Fusilade II fluzifop. Do not apply Acclaim Extra fenoxaprop if the desired turfgrass is under any type of stress, due to the increased potential for herbicide injury to occur. These applications will need to be applied throughout multiple growing seasons to obtain complete control.

OPTION NO. 3 — GLYPHOSATE SPOT TREATMENT PROGRAMS.

Spot treatments of glyphosate (Roundup Pro or similar) can be utilized to control Bermudagrass in an array of different warm- and cool-season species. Precise applications are required, since glyphosate (a non-selective herbicide) will kill any desirable turf that it contacts, in addition to weedy areas of Bermudagrass contamination. Bare areas present after application will need to be reseeded to prevent future weed infestations and improve the overall aesthetic quality of the turf stand.

FINAL THOUGHTS. Controlling Bermudagrass in warm- and cool-season turf is difficult. All herbicide programs involve making sequential applications over multiple growing seasons for complete control. In situations where Bermudagrass covers a large percentage of a given turfgrass area, complete renovation should be considered over selective removal. For more information on renovating tall fescue turfs, see UT publication W238, Weed Control During the Seeded Establishment of Cool-Season Grasses.

Always refer to the product label for specific information on proper product use, tank-mix compatibility and turfgrass tolerance. For more information on turfgrass weed control, visit the University of Tennessee's turfgrass weed science website, <http://tennesseeturfgrassweeds.org>. **GCI**

Greg Breeden is extension assistant, Turfgrass Weed Science; James T. Brosnan, Ph.D., assistant professor, turfgrass weed science; Thomas J. Samples, Ph.D., professor, turfgrass science and management, Dept. of Plant Sciences, The University of Tennessee.

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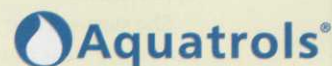


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Henry DeLozier, a principal in the Global Golf Advisors consultancy. DeLozier joined Global Golf Advisors in 2008 after nine years as the vice president of golf of Pulte Homes. He is a past president of the National Golf Course Owners Association's board of directors and serves on the PGA of America's Employers Advisory Council.

THE PURSUIT OF GREATNESS

Tiger has a swing coach. Phil has a coach for his short game and a different coach for his full swing. A lot of players have mental coaches. Bubba eschews coaches, but how would anyone know how to coach Bubba? I can only assume that Ian Poulter has a wardrobe advisor, who should be on double-secret probation by now.

Top performers the world over – from athletes to actors to business executives – seek out the people and information that make them better. The goal is the same: continuous improvement.

Leading clubs and golf businesses understand the need for continuous improvement among their employees. They know that green grass is a commodity, sumptuous clubhouses become indistinguishable after you've seen enough of them and you can get the beer only so cold before it freezes.

They realize their people are their most important competitive difference. That's why they invest not only in attracting and retaining the best people, but also in improving their skills. To them, human resource development is an essential element of their strategic plan.

During his spectacular run as manager of the Cincinnati Reds' Big Red Machine, Sparky Anderson often said, "The difference between great managers and good managers is great players." Similarly, top performing clubs understand that key management team members directly impact their financial vitality, their image and their members' satisfaction.

"Having the right team in place gives any golf facility a head start toward increasing its bottom line," says Lyne Tumlinson, who headed the GCSAA's career development program for eight years. "Investing in the development of current employees can facilitate that with less trouble and expense."

Just as every club requires a strategic plan and an annual business plan to guide long-range and near-term decisions, respectively, leading clubs make sure that those plans are executed by professionals dedicated to continuous improvement.

Tumlinson wants to make sure that superintendents don't get overlooked in the pursuit of excellence. To that end, she's launched Career Lift (www.career-lift.com) to support superintendents' career development opportunities.

She suggests that superintendents interested in furthering their careers and making more important contributions to their facilities start with a three-step

self-evaluation.

Think about your own attitudes and behaviors. In general, do people energize you or wear you out? Do you make quick decisions or do you often get stuck gathering more information? Do you prefer to communicate verbally or in writing?

Understand what makes you stand out among your peers and colleagues. What things are you best at?

Decide where you want to be in the next year, five years, 10 years and 20 years with respect to your career, finances, personal relationships, spirituality, health, family and leisure time. Write down your dreams so they get on your radar.

Once superintendents have a better understanding of their skills, interests and needs, they can work with their management team to design a **mutually beneficial** career development plan.

Once superintendents have a better understanding of their skills, interests and needs, they can work with their management team to design a mutually beneficial career development plan.

How should a club's board of directors or senior management go about developing targeted improvement for mid-level managers?

Tumlinson says start with a step-by-step process that gets everyone on the leadership team on the same page and heading the same direction.

"Reaching the ultimate goal requires working together toward the mission and vision of the golf facility, by providing the right level of conditioning for the member, golfer or customer," she says.

Tumlinson suggests coaching each professional on the team individually and as part of a group to identify strengths, improve communication, clarify roles, strengthen relationships and motivate.

"The differences between coached and un-coached managers are often plain to see in their attitudes," Tumlinson says. "Coaching is all about transformation – both inside a person and externally – so those who are open to change through feedback can demonstrate more evidence of positive development." **GCI**