

# Standing Up to Summer Stress

By Rich Hanrahan

**S**tress on golf course greens takes many forms — soil compaction, disease and poor drainage, among other things. Hot, humid weather, combined with cutting heights at or lower than .1-inch and decreased nitrogen levels for improved putting quality, creates constant pressure for greens from spring through fall.

Because stress has become such a ubiquitous problem on golf course greens in recent years, researchers in several Northern and Mid-Atlantic states have ongoing studies to explore the issue. The overwhelming consensus of these studies is simply: Healthy, vigorous turf withstands stress much more successfully than unhealthy turf.

Bruce Clarke, plant pathologist at Rutgers University, began studying stress after witnessing a big increase in dollar spot and anthracnose in recent years. He attributes the mounting disease pressure to two factors:

- Weather conditions have been conducive for both diseases in many parts of the country. Soaring temperatures and high humidity created prime conditions for these fungal diseases, encouraging disease activity for long periods during summer months; and

- Management conditions have changed to include more intensive practices, such as reducing soil moisture for increased ball speed, cutting too frequently and lower cutting heights.

"Many superintendents are being forced by their membership to dramatically lower cutting heights even on older bentgrass greens, which really can't take it," Clarke said. "The newer bentgrass varieties have been bred to tolerate a lower height of cut, but even the newer varieties don't thrive at heights lower than .1-inch."

## Slightly alter turf management

Clarke suggests superintendents slightly alter management practices to improve turf quality.

"Plants have a natural ability to resist diseases if they are healthy," he said. "Improved maintenance coupled with better chemical practices will reduce stress and minimize disease symptoms."

To offer further suggestions for improving conditions, Clarke began researching the use of

Chipco Signature in combination with other products to control disease and improve turf quality. He found that the combinations of Signature and Chipco 26GT or Daconil provided seasonal disease protection.

"In one study in northern New Jersey in 2002, we applied these combinations on a preventive basis beginning in mid-May, reapplying every two weeks," Clarke noted. "That year, disease started appearing on our untreated check plots on about July 4. We stopped applying the fungicides on August 19, but took residual data on disease control through mid-September."

Clarke's plots were a mixture of 70 percent *Poa annua* (annual bluegrass) and 30 percent bentgrass. "Annual bluegrass is well adapted to golf course greens in the mid-Atlantic, upper Midwest and New England states," he said. "Though anthracnose attacks both species, it's a major problem on annual bluegrass. But the combinations improved turf quality so well that disease was easier to control."

## Focusing on shady greens

Karl Danneberger, professor in the department of horticulture and crop science at Ohio State University and senior science editor for *Turf-Grass Trends*, has researched stress management on golf course greens since 1997. Initially, he looked at disease control in all situations, but he later narrowed his focus to turf quality of annual bluegrass on greens growing in shade.

"That's where we get most stress on golf greens in Ohio," he said. "With shaded greens, there's very little air movement, plants don't transpire and the result is a stressed turf."

Danneberger's research trials also showed that Signature in combination with Daconil or Chipco 26GT measurably improved turf quality. He used a visual scale to measure color and percent of turf cover, with a 9 rating indicating good, rich color and 100-percent cover.

"Our best results were with a Signature/26GT combination, using 4 ounces of each product per 1,000 square feet," Danneberger explained. "We sprayed on a 14-day schedule beginning in mid-May and ending in early Sep-

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### QUICK TIP

Ongoing research continues to confirm that the use of Roundup Ready Creeping Bentgrass can significantly reduce weed, disease and insect controls, as well as the use of water and labor required to co-manage bentgrass and invasive *Poa annua* on golf courses. For more information and to learn what you can do to support this new technology, visit [www.scottsproseed.com](http://www.scottsproseed.com).

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tember. Our initial test was in 1998, but results have been replicated in subsequent years. I think Signature just makes the plant healthier and able to withstand disease pressures.”

Joe Vargas, professor of plant pathology at Michigan State University, began studying turf quality improvement in 1996. His studies concentrated on annual bluegrass turf because “that’s about all we have in Michigan other than new golf courses,” he says. “If we don’t keep it alive, we play on dirt in the summertime.”

Again, combinations of Signature and either Daconil or 26GT scored highest in his quality tests. He says Signature thickens cell walls, reduces respiration, increases carbohydrates in the cell and causes an increase in mycorrhizal formation on the root zone of the turf plants.

### Slowing respiration

“Whereas photosynthesis quits at 85 degrees F, respiration continues on a linear level,” Vargas says. “The hotter it gets, the more the plant respire. If the plant is not making enough food to replace what’s being lost, it starts burning up stored reserves of carbohydrates. The more it burns, the weaker the plant becomes. If you can

**“If you can slow down respiration, you’ll get a healthier plant.”**

— JOE VARGAS

slow down respiration, you’ll get a healthier plant.

“A thickened cell wall gives the plant better resistance and a better chance of handling traffic and surviving in a bad environment, such as shade,” he adds. “Also, mycorrhiza help prevent infections on the plant roots.”

Beginning the Signature program in cool weather is the key to maintaining turf vigor, according to Vargas. By starting Signature applications in mid-May and continuing with biweekly applications through early September, superintendents can maintain a healthier turf and stave off major disease problems.

“Signature can’t work overnight,” Vargas added. “It needs time to build up the strength of the turf. You can’t start this program when carbohydrates have already been depleted from the plant. You need to start in cool weather before the stress season hits. While Signature builds the health of the plant, the other products, 26GT

and Daconil, take care of seasonal disease problems like dollar spot and brown patch.”

Turf quality testing over the past few years has shown that superintendents can get a jump on stressed golf course greens. By beginning to build turf health in cooler weather, they can develop a tougher plant, which better withstands summer stress.

*Hanrahan is senior development manager of fungicides for Bayer Environmental Science.*

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