

Heat stress

EASY TO AGGRAVATE!

by TERRY McIVER / Managing Editor

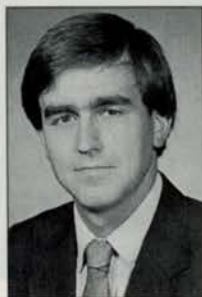
By now, we probably have an idea of what the rest of the summer will bring, weather-wise. If it's as hot as it was in 1995, remember that one turf stress compounds others.

Trouble down below

Rick Brandenburg, professor of entomology at North Carolina State, says that what might normally be tolerable heat stress is worsened due to root-feeding insects such as grubs, mole crickets or billbugs.

"Marginal root-feeding damage is often put over the limit because the damaged root system is not as healthy as it should be," says Brandenburg, who often writes on a variety of insect control topics.

"Whatever the root feeder may be," says Brandenburg, "the heat stress is in play a lot earlier than under normal conditions. You always have some insects chewing on some roots, so it's always a tough call for a lot of landscape management people who ask, 'Is the damage manageable, or is treatment required?'"



Brandenburg: Marginal root-feeding by insects takes turf over the limit.

Brandenburg suggests scouting for insects, and reminds turf managers to study up on insect lifecycles—especially during times when damage can be most severe—so you can make a timely treatment decision.

Watch greens specs

George Hamilton, agronomy instructor at Penn State University, believes soil moisture content isn't tracked as well as it should be in golf greens with modified soils.

"The all-sand or highly-modified greens are susceptible to hydrophobic conditions and localized dry spots," says Hamilton.

Re-wetting the turf is an option, but it may not work beyond a certain point, as



Hamilton: Water turf early in the morning to reduce evaporation time.

lack of adequate soil interface will result in poor capillary rise of water.

To compound the problem, a large percentage of what are called "USGA spec greens" are no such thing, according to Hamilton. He says that some contractors and greens managers are not truly knowledgeable of what goes into proper greens construction, and don't know how to properly supervise the person who is building the greens. Unfortunately, says Hamilton, some intentional corner-cutting often occurs.

"One of the main criteria is that, depending on the materials used, the rootzone mix should cover a full 12 inches, but often doesn't," attests Hamilton.

"If you start skimping on your 12 inches—say to 9 or 10 inches, you're sav-

ing 10 to 20 percent, but the greens will in theory be wetter due to the shallow mix."

The "choker" layer (the intermediate layer between the rootzone and gravel layers) is supposed to let the water perch. With newly-written, tighter USGA specs, the intermediate layer allows perching and rootzone sand to stay separate.

"If you've been told you are getting USGA spec greens or that you have USGA spec greens, have them analyzed in terms of particle size, physical properties and depth."

Aerify early

In fall and early spring, you can prepare greens for heat stress by infrequent, deep irrigation to promote good rooting into the soil profile. "Frequent, light watering causes shallow rooting, and the plant does not have rooting capacity," says Hamilton.

Remember that syringing is not the same as full-volume watering. Syringing is to be used only as a cooling agent.

If you have wilting or heat stress, you may not be using appropriate cultivation methods to start with. In fall, therefore, implement proper cultivation practices so the plant is able to use water most effectively.

Wetting agents allow areas to get maximum use of minimal rainfall, but can also serve as a form of chemical stress.

"Fairways are analogous to athletic fields, where cultivation may be limited due to the size of the area," says Hamilton. "Fairways and intermediate roughs tend to be neglected, which causes bentgrass fairways to develop a thatch layer, which interferes with proper rooting. The thatch hardens, and causes water to run off sloped areas."

Spiking is one type of cultivation

method that can be done in August without adding stress to turf, says Hamilton.

Up the cut

"You can best reduce mechanical stress by changing mowing practices," insists Hamilton. "Go to a higher mowing height and decrease mowing frequency. A 64th of an inch means a lot to a turfgrass plant."

Adds Bruce Branham, professor of weed science at the University of Illinois: "Raising mowing heights will help you attain a better water use rate, cooler turf and more shading and cooling of the root crown."

Follow windows

Hamilton advises against sterol inhibitors in times of heat stress. "There may be some growth regulation which is another kind of chemical stress," he says.

"I've gone to using systemic fungicides with contact fungicides. That works well," says Bob Chalifour of Shennecossett Golf Course, Groton, Conn., who adds that he waits a long time between applications.

"If the label says 7 to 21 days, I try to go the full 21 days," says Chalifour.



Chalifour: No greens rollers in high heat.

Chalifour says he also has been using Astron soil amendment from Floratine to help enhance root growth.

"We pull up nice, solid plugs, better than we've ever seen before," says Chalifour, who believes a good soil

aeration program can't be beaten when it comes to long-lasting benefits.

Chalifour mows the Shennecossett greens at $\frac{1}{2}$. No rollers are used.

Chalifour aerates greens in early spring and fall. He also uses topdressing, fertilizers and prudent fungicide applications.

Dr. Bob Carrow of the University of Georgia has recommended topdressing bentgrass greens with material that is dry and easy to integrate into the turf with minimal brushing. Brush material in at a slow speed across the green, Carrow advises. □

Fungicides & aeration: a one-two punch

"We were very fortunate not to lose much grass [in 1995]," says Dan Albaugh, superintendent of Ruffled Feathers Golf Club in Lemont, Ill, where the greens, tees and fairways are 100 percent bentgrass.

"We had 24 days when the temperature was 82 degrees at 4:30 in the morning. Typically, we get two days like that. So we were primed for disease last year," tells Albaugh.

In the South, Tim Davis at Cabarrus Country Club, Concord, N.C., had to protect 130,000 sq. ft. of bentgrass greens.

Combine control methods

When stress conditions are at peak levels, the key to effective disease control is to follow a thorough program. Fungicides are integral to the programs Davis and Albaugh follow, but they employ other control methods.

Albaugh adjusts irrigation as conditions warrant.

"I tend to play it by ear every day and make adjustments accordingly," he points out. "I tend to go with deep and infrequent waterings rather than frequent and shallow. I try to encourage deep rooting on the fairways by drenching them once every four or five days."

Albaugh also tends to be a little cautious with fertilizer. Greens and fairways annually receive 3 lbs. of nitrogen and 6 lbs. potassium per 1,000 sq. ft., while tees get 4.5 lbs. and 8 lbs. of nitrogen and potassium, respectively.

"I try to keep nitrogen levels on the low side and potassium high to give us a healthy turf," Albaugh notes. "If you apply too much fertilizer, you increase your chance of disease."

Cabarrus greens were first built from

hard, native soil.

"We used to aerify at a depth of 18 inches six times a year," Davis reports. "The greens were so hard in some instances that we actually broke tines."

In 1994 and 1995, the club rebuilt every green, bunker (52 total) and 14 tee boxes,

according to original George Cobb plans. The new greens and tees were made from a USGA-approved sand and peat moss blend.

Soil temperatures on the front nine average 10 degrees cooler year-round than on the back half. Fourteen inches below the soil's surface lies a solid granite layer which keeps the soil cool. The cooler temperatures provide a yearly challenge to bermudagrass growth and development, making it more susceptible to disease, Davis says.

It is perhaps not surprising that Davis follows a strict preventive schedule with his fungicides.

"We start in April by applying a good broad spectrum systemic fungicide like Eagle," Davis notes. "Then in May we move to a 7- to 12-day schedule. I never stretch it to 14 days. I tried that about three years ago, and that will be the last time. Pythium almost got the best of us."

Davis' major disease concerns, other than pythium, are dollar spot, fusarium root rot, snow mold and brown patch. Brown patch tops Davis' list. "About 70 percent of the fungicides we spray are labeled for brown patch," he comments.

Besides Eagle, which is manufactured by Rohm & Haas, Davis also uses Chipco 26019, Daconil, and combinations of Subdue and Koban, and Aliette and Fore.

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Davis: Greens were breaking tines.



Albaugh: Keeps N high, K low.



Cabarrus greens, bunkers and tees were rebuilt with a sand/peat moss blend. A granite layer 14 inches below the surface keeps the soil cool, which is a challenge to the bermudagrass.

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About his fungicide selection, Davis notes, "I like products that give us some longevity. I also like some of the old standards that have been on the market a while, but I keep a close eye on new products because manufacturers keep coming out with good new technologies."

Eagle is one of the new technologies that

Davis decided to try on his course. "We first used it in the fall of '94 for snow mold when it was still an experimental product," he says. "A lower corner on our putting green always seems to give us trouble. We sprayed the Eagle and it did a great job of clearing it up. Plus, we got 15 to 21 days (of control) out of it.

"It fits well into our rotation and into our

budget," Davis notes. "You can rely on the product and know that it's going to control the diseases you are targeting. My spray guys also like the water-soluble packets. They say they're 'worker friendly.'"

Albaugh adheres to a preventive fungicide application schedule to control his main problem diseases: dollar spot, pythium and brown patch.

"Experience has shown me that when you follow a curative schedule, you spend a lot of your time running around playing catch up," Albaugh says.

Albaugh runs a tank mix—combining a contact and a systemic—virtually every time he sprays. He also alternates products with each application to manage against resistance. The products he uses are Eagle, Banner, Bayleton, Sentinel, Vorlan, Curalan, Daconil and Thiram.

"A superintendent can't take complete credit for getting through a summer like last year," says Albaugh. "It takes the total effort of your entire staff." □

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