

# Golf courses critical care units in droughts

Turfgrass experts have a number of suggestions for care in drought situations:

## Nutrition

In drought situations, superintendents "have to be cautious about feeding" their golf courses, says Jim Snow of the USGA Green Section's Golf House in Far Hills, N.J.

"You wouldn't want to overstimulate the grass," Snow says. "Too much fertilizer can reduce your root system, and as far as top growth is concerned, it's only going to make the water use go up. So you want to feed it enough to have healthy turf and to promote a root system but you certainly don't want to overdo it at all."

Snow says that more specific suggestions would depend on the kind of grass involved and the history of the soil.

"Soil testing is crucial," he says. "You certainly should have adequate levels of phosphorus and potassium, because that will promote good root growth. If soil tests indicate low levels of either of those nutrients, you want to provide them. Keep nitrogen fertility down to low to moderate levels during a dry spell."

Norman W. Hummel Jr., assistant professor of turfgrass science at Cornell University, says the critical point in nitrogen management is to provide only enough nitrogen in the spring to promote rooting. Areas that haven't been fertilized in a year or more would benefit from a pound of nitrogen per 1,000 square feet applied early in the growing season.

On areas fertilized in fall or late fall, nitrogen should be applied until after

root production has peaked, he says. "The use of slow-release nitrogen sources at that time would help insure that the growth rate will not adversely affect drought tolerance."

## Water

Many factors have to be considered when deciding watering practices, Snow says.

"Good cultivation practices are important because you want the water to penetrate into the soil as uniformly as possible," he says. "And of course well-aerified or well-cultivated soil will generate a better root system for your turf, so you will have deeper and denser root systems but they will take up moisture better."

Snow also suggested spiking and slicing soil dried by drought.

Watering frequency will depend on turfgrass species and use, soil type and evapotranspiration. But Hummel says that during drought stress periods, light, frequent waterings will produce higher quality turf than that under heavy, infrequent applications.

"Unfortunately, water use will probably be higher due to a more vigorously growing turf," he says.

In non-drought periods, Hummel says, heavier, less frequent waterings should be adequate to maintain high-quality grass. "As summer progresses, though, root systems deteriorate and plants must obtain most of their water from the surface few inches," he says. Thus the change in hotter weather to the light and frequent recommendation.

Snow says superintendents should make sure their irrigation system is working prop-

erly and covering the turf as uniformly as possible so that when they do irrigate they don't have poor coverage. Check the pressure, nozzles, head spacing, everything, Snow says.

Snow also suggests hand-watering higher or drier spots on the course.

## Mowing

Snow also recommends decreasing the frequency of mowing. "If you're mowing every day, mow every other day," he says, although "you don't want to go a lot longer than that on a golf course."

Snow says that every time you cut grass, "you expose tissue and you lose moisture to the cut tissue."

Hummel says root systems of cool-season turfgrasses peak in the spring and mowing at a higher cut during this time should result in greater root development.

When summer arrives, mowing height changes according to what part of the country you are in.

Hummel says that in the northern two-thirds of the United States, maintaining a high-cut turf during the summer causes larger water losses due to the greater leaf area and lower resistance in the canopy to soil evaporation. He suggests that where practical, gradually reduce the mowing height starting in late spring and keep it at that height until early fall.

In the southern one-third of the country, superintendents should cut their warm-season grasses at a lower height in the spring and raise the cut slightly during the summer, according to B.J. Johnson, professor of agronomy at the University of Georgia Agri-

culture Department's experiment station in Griffin.

He says Bermuda and zoysia grasses especially need to be cut (to 1/2 to 3/4 inch) to remove thatch in the spring; but then the height should be raised as the temperature gets hotter.

Johnson says that in the South, people should cut cool-season grasses about the same the year around (about 2 1/2 inches) and this will reduce stress in the summer heat.

## Pests

"Do anything you can to control pests, especially insects, because insects can really cause a lot of problems with roots," Snow says. "They eat the roots of the plant and you have to use water like mad to keep the turf alive."

Checking for nematodes, or roundworms, and keeping them under control, is also critical, he says.

## Traffic

Keeping traffic off the turf areas is important to the turf's survival, according to Snow.

He suggested the course officials look at restricting golf cars to specific areas. An example would be to keep them on the paths, or if the course doesn't have paths, have golfers drive in the tall rough areas. But still "you can't keep running over dry turf with a golf car even in the rough so if the roughs are not irrigated, consider putting the cars off the course all together or put them on the fairways for awhile," Snow says.

## Drought

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greens — lawns and gardens with hand-held containers only."

While it is labor-intensive, Knaggs pointed out that there is also less mowing. They will most likely have to bring in water tanks to supplement their self-contained ponds and wells.

However, Knaggs is taking measures to take care of the plant structure.

"We will use deep-drill aerification on greens," she said. "We'll be cautious with fertilizer use (because the plants will grow more slowly). And we'll make sure we use potassium to help the plants under stress. We'll use a higher cut and smaller machines."

Knaggs said she could not speak for last season at Westchester because she was at The Country Club in Brookline, Mass. Last summer they, like most people in the Northeast, had a great deal of rain followed by severe heat and no rain.

"Where I was last summer, we had no water restrictions and an excellent irrigation system," she added. "But everyone in this area had similar weather problems."

"Right now, we have a perfect spring rain," Knaggs said. "But we need 6 inches a month to put the reservoirs back to normal. They should be at 90 percent now, and they are at 60 percent."

## The Southeast

In the Southeast, Hoos said that even moisture-laden Florida has had problems. "In 1988 — January to May — Florida was OK. From May on, they were behind in water. September to December they had 2 inches of rain. Normally, they get 20 inches in that time."

According to Hoos, what happens then is that canal levels drop. If it continues through

the spring and summer, they could see problems. "Most people irrigate out of the canals. And if it drops below the pump intake levels, then people won't be able to pump water," he added.

## Southern California

Back on the West Coast in Southern California, the Los Angeles and San Diego basins face problems that will become severe without adequate rain.

Hoos cautioned that the Northern California reservoirs serving the Los Angeles and San Diego basins were at 50-percent capacity for storage in April, before the snow melt and any spring rains that arrived.

"If they do not get enough rainfall to recharge the storage this winter, 1990 could be a real problem," he said, noting that normally the reservoir is kept at 75 to 100 percent.

If reservoirs are not refilled, cutback may be necessary in the greater Los Angeles and San Diego areas.

California's desert resorts, an area everyone ordinarily believes is troubled by water problems, is less affected than other areas in California, Hoos said. "Our ground water and Colorado River water is adequate. In fact, the Coachella Valley Water District sells water to Los Angeles. We have first right to the water for our area."

## The Southwest

Arizona is a different matter. Severe legislative measures have already been implemented. Courses can only irrigate 500 acre/feet per year. They can get more water after that amount, but they pay a severe penalty, according to Hoos.

This accounts for the kind of natural desert design schemes found at such places as

Desert Highlands in Scottsdale and Ventana Canyon in Tucson.

Designers and developers have eliminated grass in the roughs, promoting the target concept.

They use 60 percent to 80 percent native plant materials. The courses, Hoos said, have 30 to 40 acres of fairway and narrow bands of rough surrounded by native materials.

Homes, too, have no turfgrass.

"There is a big debate on the care of older versus newer courses because the older style courses have green fairways and roughs," Hoos said.

## Solutions available

But while there is a serious problem, there are also aggressive solutions.

The USGA Green Section's research program has a goal of developing turfgrasses that decrease the amount of water needed by 50 percent. It is starting to releasing the first grasses this year.

"There are seeded bermudas with cold tolerance that can be used in Oklahoma, Kansas, Southern Missouri. Bermudas are more drought-tolerant. The idea is to stretch the band of warm-season grass users," Hoos said.

While Hoos said the goal of 50-percent reduction in water use for turfgrasses is unlikely to happen, there is ongoing research to get as close to the mark as possible.

The University of Georgia, University of Nebraska, Oklahoma State and New Mexico State have ongoing programs to that end. They study the stress physiology mechanics in plants to determine drought and disease tolerance and decrease disease, chemical and other costs. This information goes to breeders who create stronger plants.

The issue of water for golf courses is an unending one. Perhaps Butler National Golf Club's Miles has the best philosophy: "It's everybody's responsibility to be responsible."

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