Cold stressed at the Maine turf conference

By MARK LESLIE

ROCKPORT, Maine — Hardening off cool-season turfgrasses is the most important factor in turf surviving a winter of freezing stresses, according to Dr. William Torello, turf program director at the University of Massachusetts at Amherst.

Speaking at the Maine Turfgrass Conference and Show here March 7, Torello said superintendents should make every effort to accumulate volumes of carbohydrates within the turf plant. Higher carbohydrate levels mean less internal ice crystal formation — "the kiss of death" — within the plant, he said.

Torello told superintendents to enhance the hardening process by:
• Increasing mowing heights, which "does great things for you. Even if you only bring it up 1/8 inch, it makes a big difference because you have increased leaf area and green tissues, which means higher carbohydrate production during the fall, increased storage, and increased concentration of stored carbohydrates in the crown which is going to give you a much better-prepared turf."
• Decreasing or eliminating soluble nitrogen (N) applications as the fall progresses. "Make no N applications after Oct. 15 — earlier in Maine," he warned. "How does nitrogen interfere with the hardening process? The more N picked up by the plant, the more protein it makes. Protein is made by taking carbohydrate and attaching ammonium nitrogen to it. It takes away carbohydrate."

Dormant applications are an exception, he said.

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The play's the thing, say supers who hit the links

By PETER BLAIS

All superintendents may not play as much or as well as Jim Dusch of Atlanta National Golf Course in Alpharetta, Ga.

"But it's hard to see how you can do this job and not play the game," said Dusch, winner of this year's GCSAA Championship and a self-described 1-handicap player. "My goal is to get the course to the point where it is agronomically sound and playable in my eyes."

Dusch tries to play his course at least once a week. He watches the ball rolls on the greens, how bunkers are raked and how worn the tees are as both a superintendent and a golfer.

"You don't have to be a great golfer," he said. "But you should know what the course looks like to the people playing your course. Playing helps you understand what is good and what is bad from the player's perspective. I'm not saying someone who doesn't play can't do this job and not play the game," he said. "But it's hard to see how you can do this job and not play the game," Dusch added.

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ON THE GREEN

Beating the water woes in Nevada

By ALTON PRYOR

LAUGHLIN, Nev. — Emerald River Resort and Country Club stretches for four miles along the Colorado River where it is carved out of rough and unforgiving desert. Built in 1989 on 380 acres of riverfront, it requires huge amounts of water to cope with high summer temperatures. For golf course superintendent Jay Long, water is his biggest concern. Even though he pumps from the giant Colorado River, flowing only a fairway from the course, water is an expensive commodity and Long has had to discover ways to reduce that expense.

"We pump out of the river, but cost for water is very high," Long said. "I'm budgeted $250,000 a year for water and that isn't enough. We are charged $1.94 per thousand gallons, which is the residential rate, and the superintendents on the pumps to make sure we don't cheat. When the courts broke up the water rights, the pumps are run by the day, not by the water use."

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- Increasing potassium (K) applications, generally using an application rate of 1.5 N:K, to lower water-potential levels.
- Reducing irrigation.
- Using turfgrass species and cultivars that start the hardening process early. "Grasses that start hardening off in early September versus those that start in winter, "the more energy stored in the dorman and overseeded Bermudagrass ar-

A test for dormant Bermudagrass

It is very difficult to detect the viability of dormant and overseeded Bermudagrass after extreme cold temperatures. Superintendent David Stone at The Honors Club has used a technique for many years that he learned from Dr. A.J. Powell at the University of Kentucky to determine the winter survivability of his Bermudagrass ar-

- Wash off the soil from the plug and remove the old dormant top growth.
- Expose the rhizomes and stolons by pulling the plug apart.
- Place the separated rhizomes and stolons in a Ziploc clear plastic bag, along with a wet paper towel.
- Place the sealed bag in a window or under a grow lamp.
- Create "instant summer" by maintaining a temperature near 90 degrees.
- Rewet the paper towel as needed to keep the rhizomes and stolons from drying.

- Within two to five days, green-up of the winter-surviving tillers should happen.

This essay method will take much longer if you leave the plug intact," according to Powell. Powell usually samples sites prone to winter injury during January, mid-February, and early March with this technique. Late-winter sampling will help a superin-

cultivars that start the harden-

- Temperature to freeze those tissues, Torello said. "Grasslands that begin in September, so blues have much more potential to re-

Cool-season grasses adapt to cold areas because of the natu-
ral process called hardening off — which allows them to get ready for the cold, freezing tem-

eral changes are decreased shoot growth and deeper green color. The more important internal changes are an increase or peak in photosynthesis, a de-
crease in overall respiration rate (the use of carbohydrates as energy for growth or just to stay alive), and accumulation of high levels of reserve carbohydrates in crown tissues.

Most important are the carbo-
hydrate levels in the crown, since high levels reduce water poten-
tial. "Less water means lower tem-

turfs at the onset of freezing tem-

cold areas because of the natu-

"unprotected" area for comparison pur-

The two major types of freezing stress are direct ice crystal forma-
tion inside the cell, which he said seldom happens but is "the kiss of death" when it does, and indirect ice crystal formation, which oc-
curs when ice forms between cells within the dormant crown.

"This occurs in all cool-season turfs at the onset of freezing tem-

temperature to harden until Octo-

Because the plant lives off reserve carbohydrates during the winter, "the more energy stored during the fall, the better off the plant will be," Torello said. "Photo-
synthesis is very slow, if at all, in the winter. Respiration must continue, albeit slowly.

Citing ice-cover injuries and stress as another turf killer, Torello suggested that superintendents faced with this situa-
tion punch holes or crack the ice at 1- to 3-foot intervals; apply dark granular organic materials which absorb heat and form holes in the ice; or combine the two methods.

"The injury to the turf is due to lack of gas exchange," he said, which cuts off oxygen and builds up hydrogen cyanide and carbon dioxide.

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