

Learning curve the major bump in green speed

By MARK LESLIE

MONTREAL — Operating in the fast lane of green speed, the turfgrass industry is still on the learning curve and with no finish line in sight, according to Dr. James Beard.

The former Texas A&M professor told an audience of superintendents here at the Canadian

International Turfgrass Conference and Show: "It's a day and age of golfers demanding fast greens. You can agree all you want about a higher height of cut, but I think the golfer will still demand fast greens. It's here to stay."

Beard explained changes in grass cultivars and cultural practices, especially top dressing and

increased rolling, that will help superintendents cope with the higher speeds,

"Green speed differs from cultivar to cultivar," he said. "You cannot assume that higher density equals faster speeds. High-density greens may, in fact, be slower than certain of the lower-density greens, depending on

what cultural practices are used."

Saying there is "a tremendous difference in bentgrasses," including biomass, Beard said that for the first time researchers are able to get actual density counts. It reflects heat tolerance and the grass's ability to be grown more easily.

"You're going to be more suc-



cessful growing greens with dense root systems," he said.

New grasses, able to be cut at 3.2 millimeters (1/8-inch), "suddenly are performing very well," he said. "Times have changed. At many places, these are the grasses that will be used in the future."

Speaking of the Penn-series bentgrasses, Beard said: "There is a learning curve on their culture. They have density that dictates different vertical cutting, top-dressing regimes and approaches in terms of nutrition. But high-density types are very impressive, very promising. They will help solve a lot of the problems on those golf courses where extraordinarily low mowing heights are demanded by the membership."

Meanwhile, research has illustrated that superintendents should consider rolling their greens as opposed to further lowering mowing heights.

"Lower mowing," Beard said, "results in weakened turfgrass, shallow rooting, more moss and algae problems and the controls that are required for that."

On the other hand, today's greens with high-sand root zones don't compact, so the option of rolling involves minimal negatives. And, Beard said, superintendents can also cut the grass higher and roll it.

He cited ball-roll studies done on a putting green of mature creeping bentgrass with normal mat and no thatch, on well-drained greens and high-sand root zones. It was a fast green. Pre-rolling distance, according to Stimpmeter readings, ranged from 9.3 to 10.7 feet.

The findings included:

- A single rolling in early morning consistently increased the distance 10 percent. Double-rolling raised it 11 percent. Three-roller units raised the distance 17 percent and four rollers increased it 20 percent.

- Speed gained by rolling with a single roller drops 5 percent by mid-afternoon. But it comes back up the second day.

- Generally, turf-rolling benefits lasted two to three days. "So we're looking at rolling twice or three times per week," Beard said.

- North Carolina State University rolled seven times a week and found that any rolling beyond three times a week they started to see thinning and loss of turf.

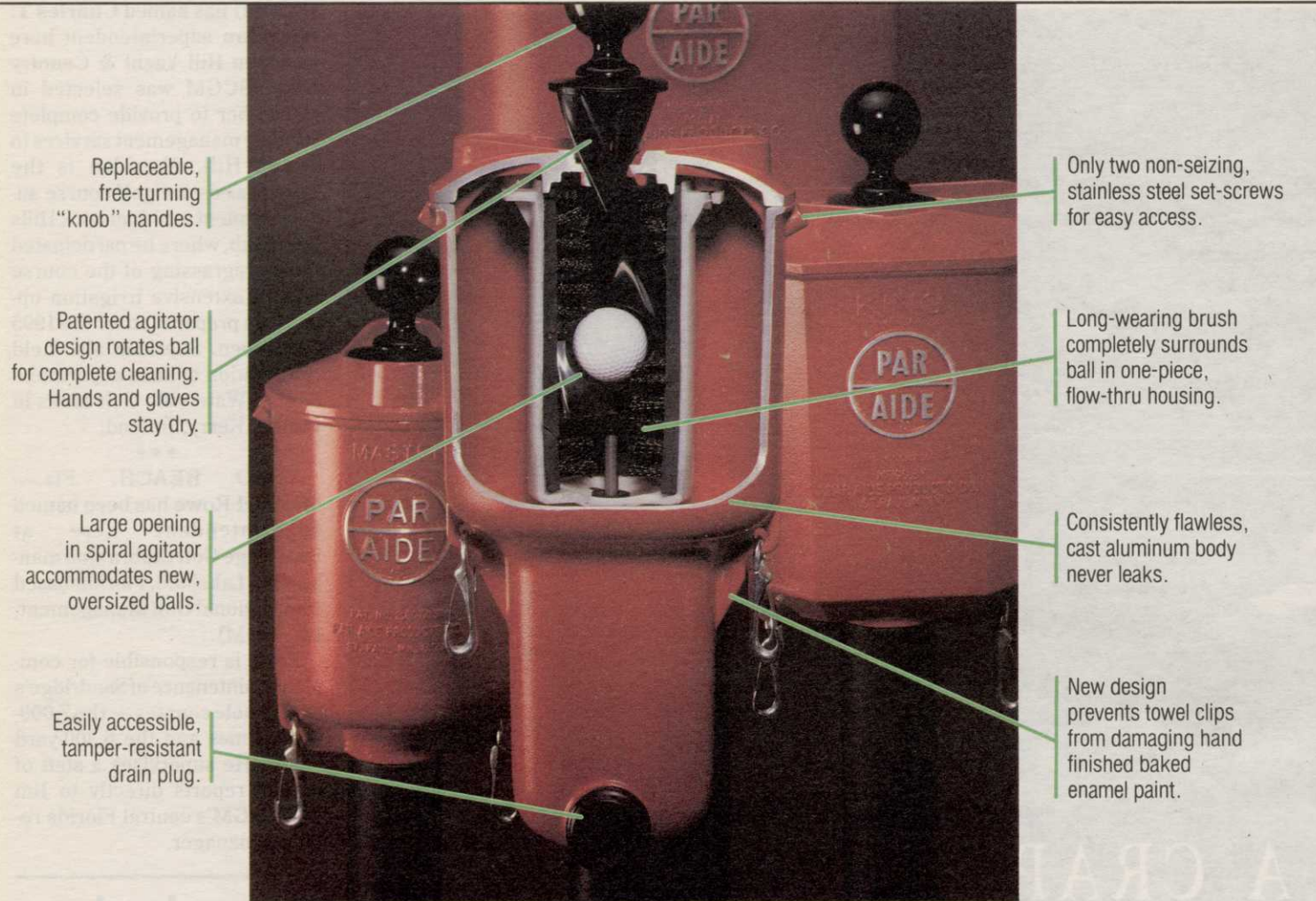
- It's best to roll immediately after mowing. Rolling beforehand provides very little effect.

- Operating speed of the roller does not influence distance in ball roll.

- Long-term rolling studies at

Continued on next page

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By MARK LESLIE

MONTREAL — Declaring that a large gap exists between scientific evidence and the perception of danger, Dr. Harry Baikowitz said the media, governments and environmental groups are scaring the public and taking its money to correct "problems" that don't exist.

Speaking at the Canadian International Turfgrass Conference and Show here, Baikowitz addressed the myths and realities of environmental concerns, saying, "Some myths die hard." They die hard, he said, because the media manipulates them and environmentalists perpetuate them.

Listing a barrage of "myths" from the alar scare to the claims that cranberries and cellular phones cause cancer, Baikowitz added, "Blaming ozone depletion and global warming on CFCs and humans is a leap that has no basis in scientific fact."

"There is more truth," he said, "to Woody Allen's statement: 'Help stamp out pollution. Eat a pigeon.'"

Baikowitz, whose doctorate is in chemistry, cited the existence of a "fear coefficient" in which the more common the chemical that is being discussed, the higher the fear.

False claims, he said, are also being made against golf courses.

While pesticides are described as "toxic," "dangerous," "ground-water pollutants," Baikowitz said: "We've done a lot of studies on the retention of all forms of pesticides, especially fungicides,

Beard on speed

Continued from previous page

Michigan State University found more than 50-percent control of brown patch and several other disease organisms on plots that are rolled.

- Rolling provides a decided visual improvement in surface smoothness for ball roll.

- How much higher cutting height does rolling allow? Certainly 1/32 of an inch and, in some cases, 1/16 inch, depending on leaf-growth rate, Beard said.

"Certainly rolling is back in vogue," he said, "and with minimal problems — if you don't do it more than three times a week and if you do it on properly constructed high sand-based greens. It will be with us a long time."

While rolling is one of the oldest techniques in turf, Beard said: "Yet we are just starting to learn about it... A lot of changes are happening. They have implications not just on the choice of a cultivar, or rolling practices, but the total cultural management program that is allied with that. We have a lot to learn about how they will be best used."

Science today: Myth & theory vs. fact

in water and soil, and our data certainly does not support that there are any kinds of residuals that would contaminate underground waterways of golf courses. And these [courses] have been around for at least 40 years."

The government defines "dangerous" as a substance that

causes a substantial increase in mortality, he said. "If a pesticide can add one cancer in 1 million people, it is considered a carcinogen. Yet one of three people get cancer in their lifetime."

Turfgrass diseases are treated with fungicides, he said, and they represent 1.6 percent of total pesticide use in North America.

They have the lowest toxicity to humans.

"Nature generates toxins that are at least 10,000 times more toxic than any manmade chemical, and we're exposed to them every day," Baikowitz said.

The "real data" that exists, he said, "does not support the hysteria and finger-pointing we're

exposed to day to day."

Yet, he added, superintendents must be armed with facts in order to answer concerns or false claims from golfers and others.

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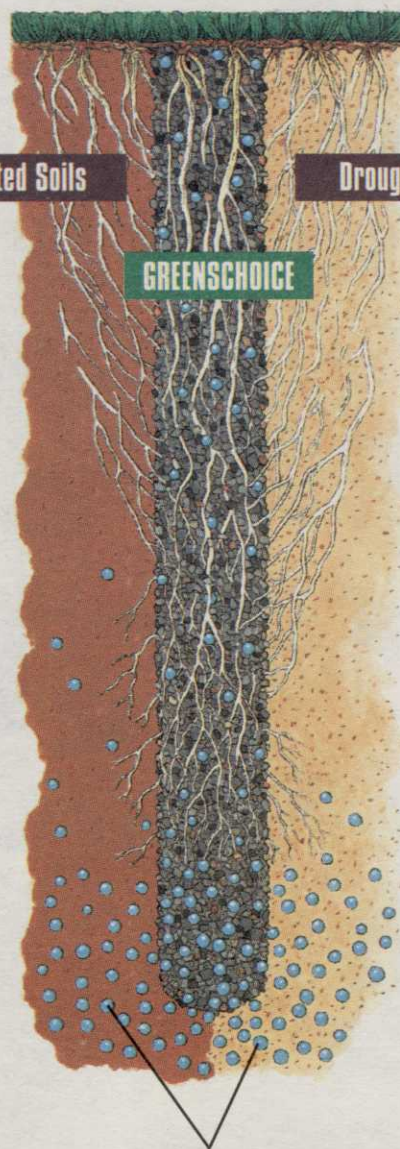
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WINTER COVERS

Improving The Combat Zone

By MARK LESLIE

MONTREAL — It's The Combat Zone: Chinook winds, open winters, long-standing ice, heavy shade... all enhanced when a golf course's turfgrass is cold-sensitive poa annua. Winter in the North, superintendents here agreed, is a time when they can do little except pray they made the correct decisions in the fall.

Greens covers — some solid, some "breathable" — are becoming more a staple of winter protection, and three superintendents shared their techniques in using them during the Canadian International Turfgrass Conference & Show here in March.

While many superintendents, especially those whose courses are predominantly bentgrass, do not use greens covers at all, that is not the case with Dean Morrison, Blake Palmer and Hugh Kirkpatrick.

Kirkpatrick's 65-year-old Westmount Golf & Country Club in Kitchener, Ontario, has "a tremendous amount of shade" and is mostly poa annua. "We trust our bentgrass but not our poa," said Morrison, whose Calgary (Alberta) Golf & Country Club faces "a lot of Chinooks, open winters and related problems, especially desiccation." And Palmer sees very little snow and a lot of rain and freezing rain at Rockwood Park Golf Course in St. John, New Brunswick.

Greens covers or tarpaulins are integral for all three — regardless of the cost. As Morrison said: "It's not cheap, but how do you put a price on dead greens? It's the bread and butter on your table."

On the other hand, few superintendents can afford to cover all 18 greens. In addition to the covers themselves Morrison's cost per green were \$120 for straw, \$240 for labor, \$90 to dispose of the straw and \$50 for miscellaneous items.

Strong believers in the ability of bentgrass to survive winters, Morrison, Palmer and Kirkpatrick cover only greens they feel may be in jeopardy of winter injury.

The payoff can be a golf course with turf that survives the winter and that opens quicker in the spring. Palmer, a past president of the Canadian and Atlantic golf superintendents associations, said: "In 1973 we only had nine holes and May 15 was our target

MAINTENANCE

opening date. Last year, with 18 holes, we opened April 23 and we wouldn't be able to do that without covers."

Meanwhile, cultural practices also enhance winter survival.

"It's very important to 'harden off' the turfgrass going into the winter," said Kirkpatrick, 1996 Canadian Superintendent of the Year. "Don't let it go into the winter lush."

Kirkpatrick recommended

aerating late in the fall and leaving the cores, which he feels help desiccation and heat up the snow to melt it in the spring.

Since greens covers create good conditions for disease, especially snow mold, fungicide applications are important before the covers are laid down. Palmer said application rates must be cut far back on turf that will be under cover.

Morrison said he stopped us-

ing straw on greens in favor of covers because the straw drew water out of the grass.

Palmer also suggested applying 5 to 5-1/2 pounds of potassium per green.

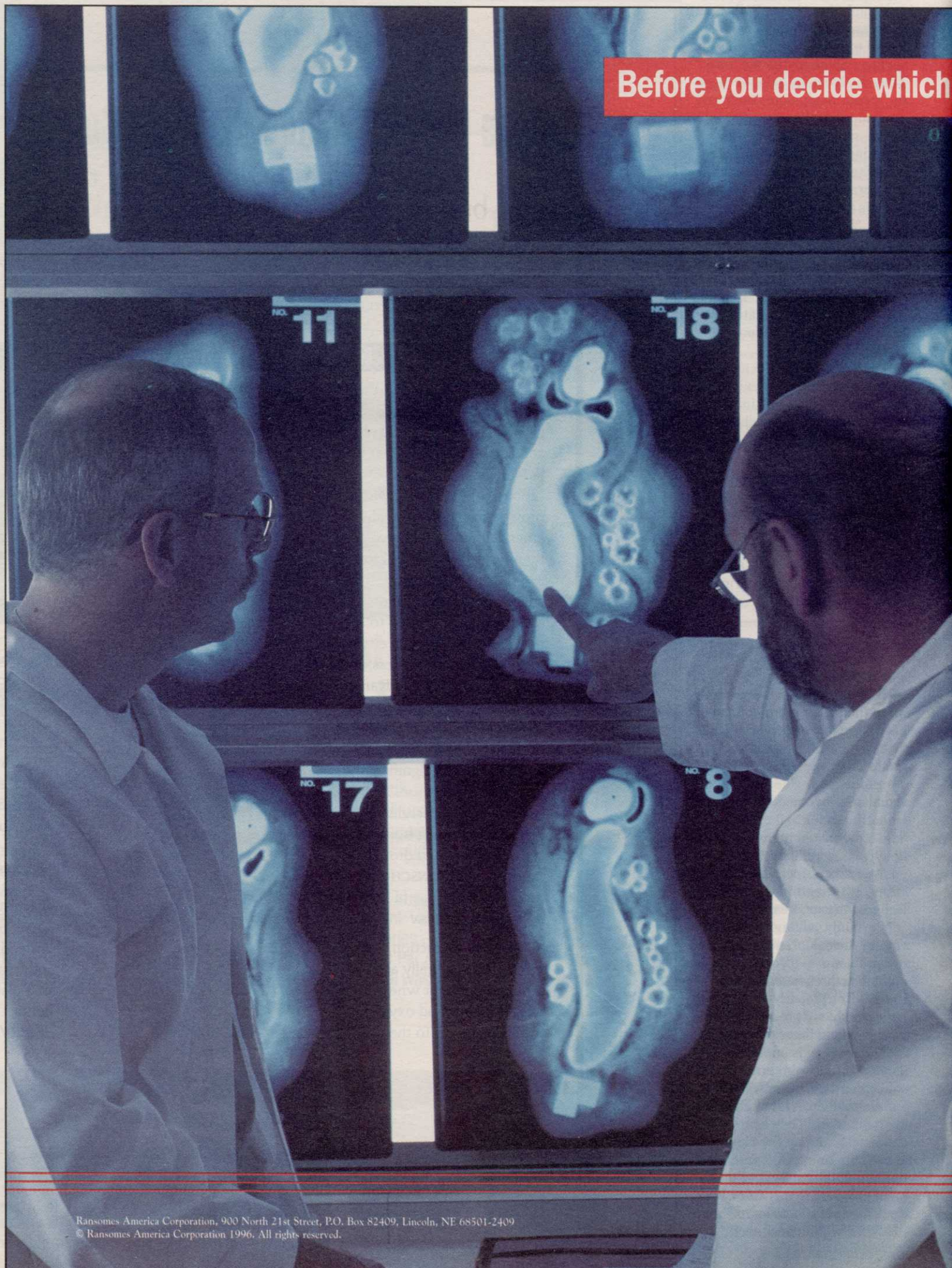
Morrison uses the breathable Evergreen covers on his bentgrass greens. On his poa annua greens he lays down a solid tarp, then 8 to 10 inches of straw on top of that, and a second solid tarp on the straw.

A tarp will last three years on the top and another three years on the bottom, he said.

Morrison added that if water gets under the covers, they will fail. So battening down the covers and ensuring they do not leak are crucial.

When using Evergreen covers, he said he puts a lot of branches on them to hold them down and covers them with 8 to

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RESEARCH UPDATE

Organism discovered that fights gray snow mold

By MARK LESLIE

MONTREAL — Researchers at the University of Guelph have discovered an organism that suppresses development of gray snow mold, according to Teri Yamada, national director of the Royal Canadian Golf Association (RCGA) Green Section.

Updating Canadian superintendents on research at universities funded by the Canadian Turfgrass Research Foundation, Yamada said studies have found that some isolates of *Typhula phacorrhiza*, a naturally occurring fungus found on corn debris, control gray snow mold as well

as or better than a control application of Daconil 2787 @ 2g a.i./m². And on those plots where *T. phacorrhiza* was applied along with the causal agents for gray snow mold, the turf remained clear of the disease the following year as well.

"This is very exciting,"

Yamada said. "But it's also a bit disconcerting to us as a funding agency. Ultimately, we would like to see a biocontrol developed and commercially produced for you. We have a couple of hoops to go through. We have to check risk analysis... We also have to find a way to deliver that



biocontrol onto the green.

"And, if you only have to use it once, we may have problems finding a company that will sell it."

University of Guelph scientists are working on the possibility of pelletizing *T. phacorrhiza*.

Storage is another factor. "They have been able to store *Typhula phacorrhiza* for up to 16 weeks," Yamada said. "But the organism is no longer viable after that period unless stored at minus-15 degrees Celsius."

Gray snow mold in Canada is usually caused by one of two organisms — *Typhula incarnata* or *Typhula ishikariensis*. It was discovered that *T. phacorrhiza*, when put in contact with the other two organisms, actually suppresses development of gray snow mold symptoms.

During the winter of 1994-95, Prof. Tom Hsiang inoculated field plots with 46 isolates of *T. phacorrhiza*. Some of those isolates equaled or bettered the control given by Daconil. The best 30 isolates and 16 new ones were used for the second round of testing in winter 1995-96. The 1994-95 plots were not reinoculated with *T. phacorrhiza* to test for residual effect. Several plots stayed clear of snow mold despite the causal agents being reapplied.

...

Yamada is also excited about a "star wars"-type project at University of Guelph, where scientists are working on using micro-projectile bombardment to "shoot" antioxidant-producing genes into bentgrass cells.

The overall project has Guelph researchers investigating genetic transformation of creeping bentgrass to enhance environmental stress tolerance. The project, which they hope to expand into ryegrass, is exploring three techniques — one using an agri-bacterium to take genes into the cells; another using electrical current; and the third employing micro-projectile bombardment.

The bombardment "has been successful with alfalfa," Yamada said.

She explained that in plant cells, as in humans, there are oxygen-free radicals, which can be toxic. Antioxidants detoxify those oxygen-free radicals.

Dr. Steve Bowley has been able to introduce a gene into alfalfa that detoxifies some of the free radicals in the plant. Plants with this gene tend to be more tolerant of such stresses as drought, high and low tempera-

Continued on page 29

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Optimize, DiPaola urges supers

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 mize the benefits. That's helpful [to know] for those you are working for and those who are working with you to get the job done."
 Calling superintendents to implement a turfgrass agronomic plan, he said: "We need the long-range look, and the interactive look, that we haven't quite put together in turf man-

agement."
 Such a plan, he said, identifies the turf areas of the course and the goals for each. "This is novel for some folks," DiPaola said. "What is it that you're trying to do with the greens, tees, roughs and fairways, and are you getting there? In this agronomic plan we have fixed constraints: schedules for major tourna-

ments, club policies about when certain cultural practices can be done, and contractual constraints particularly for resort facilities where they're promising people that certain things won't happen while they're playing golf."
 The goals will vary with each turf area.
 Optimizing course conditions, he said, is not a good goal "unless you can measure your suc-

cess." Maximizing the uniformity of greens and minimizing local dry spots, for instance, can be measured. So, also, can soil-infiltration rates, crown health, standard density and Stimpmeter speeds.
 Contingency plans should also be established for cases when the winter is twice as cold as normal, or the summer is twice as hot, or the irrigation system goes down.



"Keep the plan useful," he said. "Refer to it regularly. Adjust to your successes and failures. Particularly keep good records of what you can't figure out. And measure the progress toward your goals."
 "Let your employees know they helped you get there. And let the management of the club know that you've made the difference."

Winter covers

Continued from page 22
 10 inches of straw.
 "We use flax straw because there's no seed. It also won't blow away like wheats or barleys will," Morrison said.
 Using large rolls of straw instead of bales, his crews can bed down a green in about four hours, he said. The covers are nailed down every two feet and tires are used as anchors.

Palmer uses wood-shaving mats and Astrofoam on top of the covers instead of straw. A 6-foot-wide, 300-foot-long roll of Astrofoam costs \$125. The package costs 74 cents a square foot, he said. He complained, however, that the Astrofoam "tears easily and is difficult to put down."

In the spring the timing of removal of the covers is crucial, the three agreed. Thus they monitor the green temperatures. Palmer suggested putting the covers back onto the greens at night until mowing begins.

Morrison uses a Toro with a blade to clean off the greens, while Palmer's crews use leaf blowers.

Morrison's crews also Verti-Drain the greens around May 10-12, an action which he said "gains us about 12 days."

On the negative side, Palmer said: "I am disappointed that most times the covers seem to split at the seams. I feel if manufacturers could use a heavier material and, if possible, without seams, they could make a better product."

Kirkpatrick added that breathable covers "didn't do much for us against crown hydration."

Morrison said his experience shows that 6 inches of snow will give the same insulating factor as two tarps and straw.

With the heavy snow of this past winter, he said, "I may have wasted my money."

On the other hand, if there had been no snow and he had not covered his greens, the results could be deadly.



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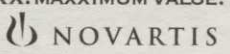


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a good one.

"I wrote a two-page letter to all of our members explaining that run-off is the result of negligence," Snyder said. "I explained to them that we properly apply the products used on the course and, therefore, run-off is not a problem for us." Snyder credits the low water solubility of pre-emergence herbicide, which kept the product from moving, even on slopes and hillsides.

Snyder communicates regularly with members.

He writes a column for the course newsletter on maintenance that includes a lawn-care tip, and puts weekly notices on a bulletin board

"Following the winter of 1994, we lost 30 acres of fairway grass to ice damage," he said. "I used the bulletin board to explain to our golfers how we were going to re-establish the grass. This let them know what we were doing and how their cooperation and patience would help."

According to Snyder, taking a chance and winning, gives more courage to try something new the next time. You have also improved your golf course and your career.

Zebra mussels, other topics due

BURLINGTON, Vt. — Terry Bastian of Waterflow, a North Reading, Mass., ecological design firm that consults on Northeast courses, is speaking at the 2nd annual Northeast Conference on Nonindigenous Aquatic Species here.

The spread of zebra mussels, hydrilla, water chestnut and similar vegetation is a concern of

scientists, environmentalists and superintendents as they struggle with keeping their water features alive and beautiful.

Bastian's lecture, "Loosing Loostrife by Fire" details his work with fire management at the Sagamore Spring Golf Course in Lynnfield, Mass. The goal was to burn the wetland and keep it in a sedge meadow stage of succession, killing the speckled alder, poison sumac and white pine bushes that restricted air flow to the 15th green, exacerbating fungal problems. The burn worked and the green responded very well, being the healthiest green the next season.

"What I had hoped to do was lessen the fungicide and pesticide use with a practice that was used here until the 1970s. What was a pleasant surprise was that this technique severely affected the exotic purple loostrife population that was squeezing out the native plants," Bastian said.

Research update

Continued from page 23

tures. He wants to introduce that gene into bentgrass and possibly ryegrass.

Last year was the first year of the three-year study.

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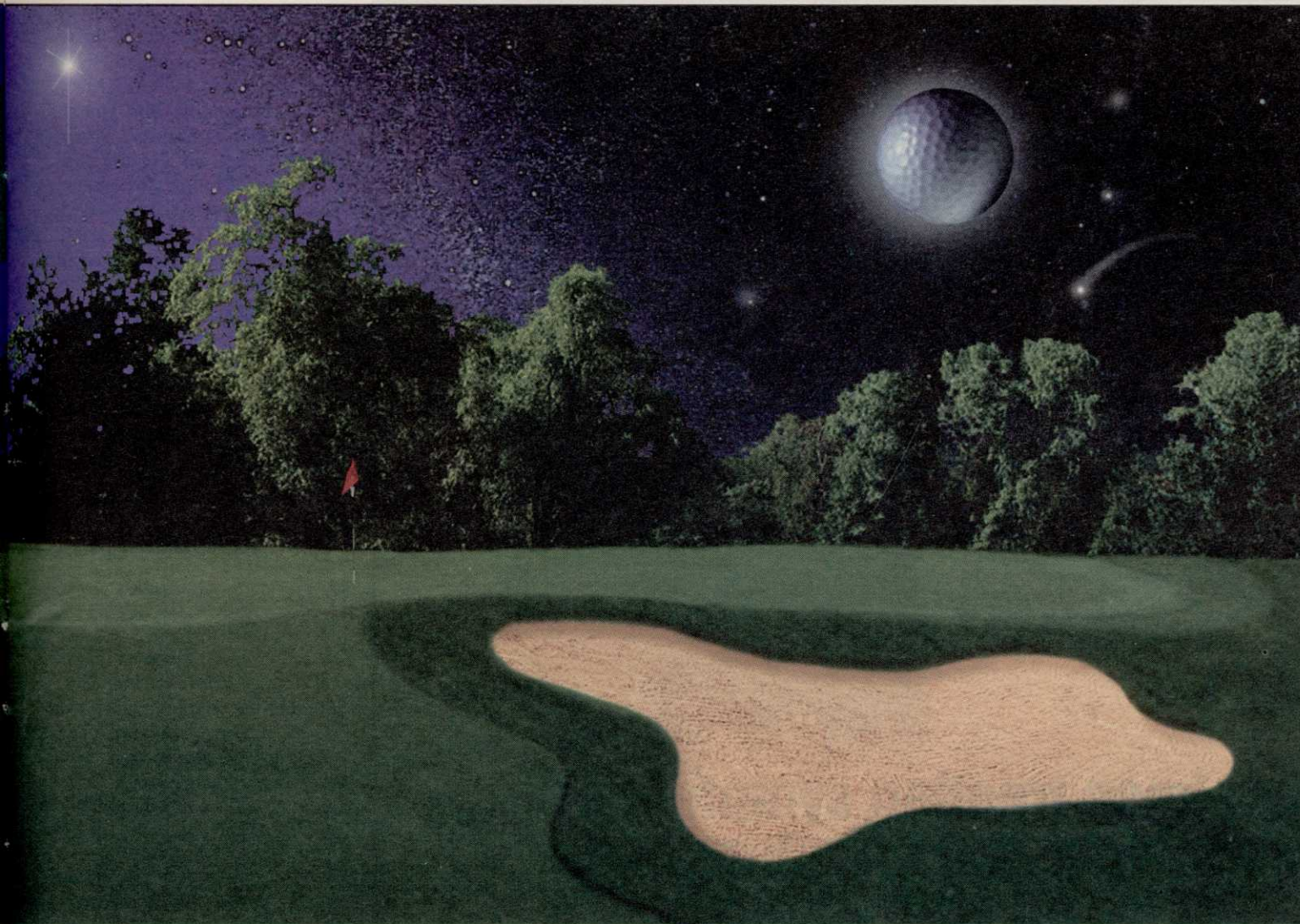
In other research:

- At the Laval University, PhD student Julie Dionne and Dr. Yves Desjardins have studied winter covers, finding that -10 degrees Celsius is "the critical minimum temperature where poa annua starts to sustain damage," Yamada said. "If you are in a very severe low-temperature climate and do not have any insulating covers, be it snow or other, you are in danger of sustaining damage just from low temperature."

- At Olds College researchers saw the trend for poa annua to deharder faster in the spring than bentgrass, explaining why it is more susceptible to early-spring damage.

- At the University of Manitoba scientists are investigating use of native species of perennial grasses and their potential use on golf courses and other settings as low-maintenance turf. They are establishing plots of buffalograss, side-oats grama, inland desert salt grass, tufted hair grass, Canada bluegrass, prairie junegrass, fowl bluegrass, alkalai and other non-traditional types of grasses. This year they will cut them at 7/10, 1-1/2 and 2-1/2 inches to see if they can be used on golf course roughs in very low-maintenance areas without irrigation.

"They will also be selecting for drought-tolerance as well as salt-tolerance," Yamada said.



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