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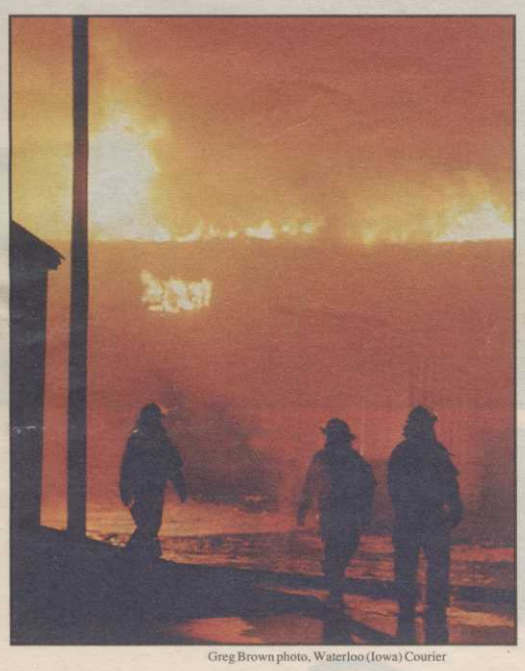
Fungicides hit the spot
See pages 24-25

INSIDE



Greg Brown photo, Waterloo (Iowa) Courier

FIRE STRIKES STANDARD GOLF, PAGE 3

Gunning for better disease resistance

Newest biogenetic research goes biolistic

By PETER BLAIS

The U.S. Golf Association, seed companies and others are taking their first baby steps into the area of genetically engineered turfgrasses, hoping research will eventually lead to plants that are resistant to many turf ailments.

Recent advances in the technology of transferring genetic material, specifically the biolistic method, has helped make that possible, according to Dr. Peter Day of Rutgers University's Cook College.

Basically this involves taking a plastic projectile with a surface layer of tungsten or gold. It is then coated with DNA containing the desired genetic trait.

The projectile is fired with a 22-caliber cartridge toward a steel plate with a small hole. A partial vacuum containing grass cells is on the other side of the plate. The steel stops the projectile, but the DNA continues through the hole and hits the target cells. Some of the DNA penetrates the nucleus.

Continued on page 22

Reregistration claims another industry victim

By HAL PHILLIPS

The specter of EPA reregistration has doomed another chemical product to the dustbin of history.

Miles Inc. announced in early April that its Dyrene fungicide products, which contain the active ingredient anilazine, have been voluntarily canceled due to the cost of obtaining data for reregistration support.

"There are a lot of people around here who are sad to see it go," said Rick Robb, marketing manager for Miles. "But it was a business decision. We have another fungicide product (Baleton) pending reregistration and it was too expensive to go ahead with Dyrene."

Continued on page 45

Jeff Martin

Clemson University to create course/ laboratory

By MARK LESLIE

A living, breathing, working laboratory in which handicapped and able-bodied people alike can play championship-level golf.

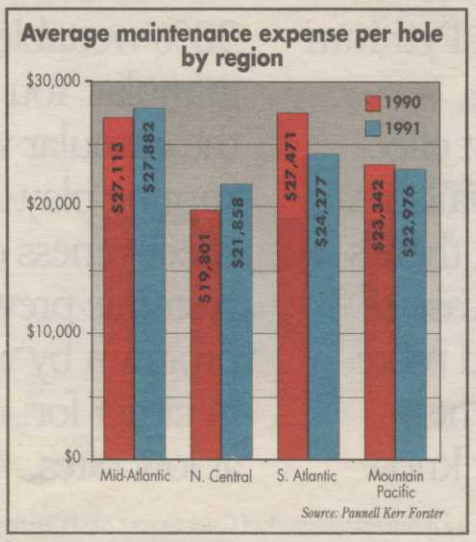
That's what the folks at Clemson University hope to develop on a 250-acre plot of land that contains peach orchards and borders manmade Lake Hartwell on their Clemson, S.C., campus.

"This project hits all the hot buttons," said Bob Wilson, the National Amputee Golf Association national director who is involved as a consultant for the

Continued on page 32

NEW IDEAS FROM AN OLD MASTER

Architect Robert Trent Jones Sr. stands on the first tee at his Oxmoor Valley course in Birmingham, Ala. Built by Sunbelt Golf Corp., Oxmoor Valley is one of eight golf complexes constructed with Alabama state pension funds. For related story, see page 5.



PKF report says rounds up, maintenance costs down at resort and daily fee courses

By PETER BLAIS

Signs of recessionary times: Rounds were up, revenues stayed even and maintenance costs went down at daily-fee courses from 1990 to 1991.

That's the message contained in the first "Trends in Resort and Daily Fee Golf" published by the National Golf Course Owners Association and Pannell Kerr Forster Consulting Inc., the accounting firm that also does the "Clubs in Town & Country Report" for the pri

Continued on page 42

Biogenetic researchers in quest of better disease resistance

Continued from page 1

"As extraordinary as it may seem, in fairly low frequencies, DNA becomes integrated into some of the target cells. If it confers a selective advantage on the tissue culture medium, grass cells with that advantage will grow," Day said.

Day's colleague, Dr. Lisa Lee, will use this technology in a three-year, USGA-funded study titled "Development of Improved Turfgrass with Herbicide Resistance Through Transformation."

Dr. William Vance Baird of Clemson University also received funding for a project on "Low Temperature and Drought Regulated Gene Expression in Bermudagrass" as part of the USGA's $4.15 million in 1993-97 research grants.

Others interested in genetic research include Turf Seed and Jacklin Seed, both reportedly studying biotechnological methods of introducing herbicide resistance. Japanese companies are also rumored to be spending millions of dollars in genetic research on turfgrass.

"The United States has had superiority in biological research for years. But the Japanese are catching up. If they put serious money into genetic turfgrass research, like they put money into VCRs, they could probably outcompete us," warned Jacklin Research Director Doug Brede.

Day said work at Rutgers has been successful in using endophytes to control insects in turfgrass.

Day believes that grasses resistant to broad-spectrum herbicides transferred into turfgrasses would enable superintendents to treat weedy areas without killing the grass.

Presently, often the only choice is to re-sod a heavily weed-infested area, an expensive and time-consuming process sure to result in disgruntled golfers, Day explained.

If all goes well, genetically engineered, herbicide-resistant grasses could be on the market in four to five years, Day predicted. The technology could be expanded to traits like drought resistance and shade tolerance. But that could take longer, since identifying the genes responsible for those traits is more difficult than identifying the genetic material causing herbicide resistance, the Rutgers researcher said.

Baird's work on cold and drought tolerance is more preliminary than Day's, Baird said. Clemson researchers have done considerable work on broadleaf plants, mostly food crops, that Baird hopes may be applicable to turf.

Baird is scouring the country in search of the most cold-tolerant Bermudagrass germplasm available. He will use that material to try to understand cold hardiness at the genetic level.

That will be difficult because the trait is complex. It probably is not controlled by a single gene as is most herbicide resistance, he explained. The same is likely true of drought resistance, he added.

Baird hopes to have a positive identification of both traits by the end of the three-year USGA funding.

Introducing the genetic material to Bermudagrass tissue will not be difficult. Getting the turfgrass to regenerate from a few cells will, he predicted.

"Turfgrasses have been hurt by lack of research in the regeneration area," the Clemson professor said. "More work has been done on food crops because they are generally considered more important."

Scientists have identified a gene in halibut that stops the fish's blood from freezing in cold northern waters, Baird said. The gene is being tested in food crops, which could eventually benefit turf research, he added.

Turf Seed is supporting university work into genetically engineered herbicide resistance, according to company plant breeder Crystal Fricker. The Oregon-based firm is also working on marker genes that would help identify its grasses and make certain other companies did not infringe on its patents, she added.

As for herbicide resistance, because of the regeneration problem, "We're probably five years away from a biotechnically engineered grass," Fricker said. "And it would take another two years to register it."

Brede predicted a genetically engineered, herbicide-resistant grass will be available in 10 years, with drought- and disease-resistant strains 20 to 30 years down the road.

Japanese companies, with whom Jacklin has already had some preliminary discussions, could get there sooner, Brede said. While the U.S. government stresses competition, the Japanese encourage two or three companies to cooperate and pool finances on research efforts.

"Sometimes that stops us from doing research as effectively as the Japanese," Brede said.