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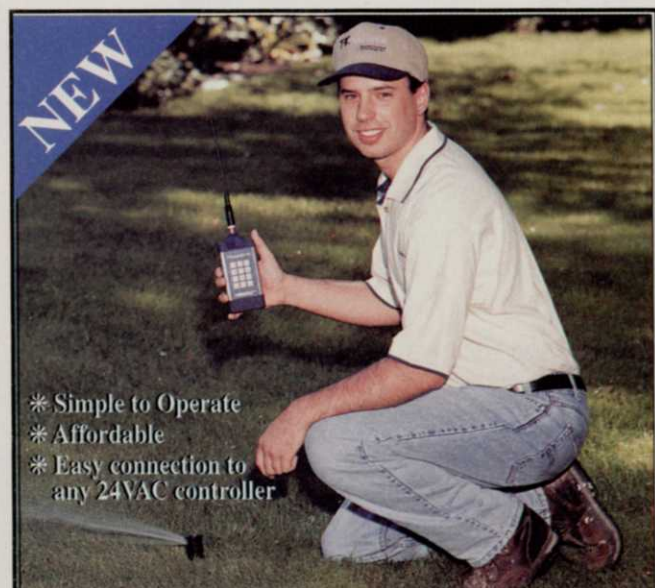
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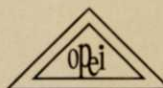
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NC turfgrass industry is booming

RALEIGH, NC—Researchers and educators in North Carolina hustle to stay ahead of the state's expanding turfgrass industry. That they're able to do this is credit to their resourcefulness and far sightedness. And also to the cooperation that they've forged with the professional turfgrass community, particularly the influential Turfgrass Council of North Carolina (TCNC).

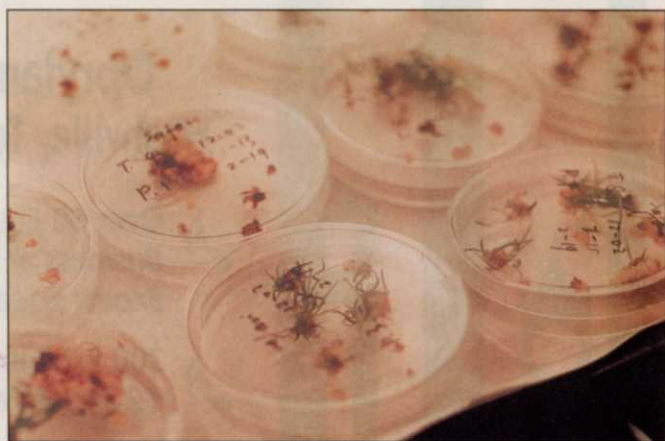
The hub for this activity is North Carolina State University. The turfgrass staff at NCSU spearheads a full menu of research and outreach programs, in addition to instructing over 200 students in both its four- and two-year programs.

Because of the growing importance of these programs and of turfgrass, in general, to the state's economy, NCSU is considering expanding its turfgrass research field center, says Dr. Arthur Bruneau, Professor of Crop Science.

A 20-acre site a few miles from the present site is a probable location.

Meanwhile, turfgrass research progresses at NCSU, and at other locations throughout the state too, from the sandhills in the center of the state to the mountains in the west. These include turfgrass variety trials (including NTEP trials), pesticide trials, water quality and nutrient management studies, detailed investigations into turfgrass physiology and others.

One of the newest turfgrass research efforts at the university involves turfgrass bioengineering. Researcher Dr. Rongda (Ron) Qu and his



These turfgrass plants represent the beginnings of North Carolina State University's efforts to genetically engineer improved turf.

small staff have begun work on the state's three dominant turfgrasses: tall fescue, perennial ryegrass and hybrid bermudagrass. The goal is to

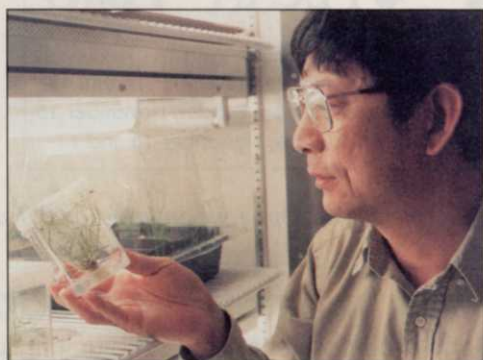
improve, through genetic engineering, each of these species for the mid-Atlantic region's special conditions—for instance, developing a hybrid bermudagrass with resistance to nematodes, brown patch resistance for tall fescue, solving the summer persistence problem for perennial rye.

The process won't be as simple as identifying specific genes and "shooting"

them into turfgrasses to get grasses with improved characteristics, stressed Qu. The process is vastly more involved than that; but it can be accomplished given time and sufficient funding, he said.

"In our first year we spent most of our efforts in the tissue culture stage," Qu explained. "We've also started some transformations and got some calli." (Callus is the undifferentiated mass of cells, at least from appearances, in a culture dish that eventually sends forth leaves and roots and becomes plants, in this case turfgrass plants.)

"Ten years ago we weren't doing any of this gene transformation work," added Dr. Charles Peacock, professor of crop science. "But we have to take advantage of genetic transformation with the demands everyone is making on providing as good a quality



Dr. Ron Qu, above, heads NCSU's turfgrass genetic engineering effort. He's shown to the left with, far left, Dr. Arthur Bruneau and Dr. Charles Peacock of the NCSU turf staff.



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- ▶ turfgrass industry employs over 114,300 fulltime and seasonally, with an annual payroll of \$374 million,
- ▶ invests over \$830 million in annual turfgrass maintenance expense plus the ownership of \$3.5 billion worth of turfgrass maintenance equipment.
- ▶ hosts over 15.3 million rounds of golf a year.

turf as possible with as little input from a nutrient, pesticide and a water conservation viewpoint.

"We're not looking for any real quick turnaround," he added, "but 20 years from now we're going to have grasses that are more stress resistant, more pest tolerant and that take lower inputs and give us better quality; genetics can do this."

The turfgrass genetics work—like turfgrass research everywhere—is being funded by "a mixed bag" of sources, said Sam Lang, one of the directors of the TCNC. These include funds from the university, from the state legislature and help from the TCNC itself that annually provides the university's turfgrass program with over \$100,000 for research.

Lang identified water quality in the state's rivers as another issue that the state's turf industry and turf researchers are being asked to help. North Carolina has 14 significant rivers flowing across it toward the Atlantic

Ocean, and the state is gearing up to reduce nutrient loads 30 percent in all of them. The first river it has targeted with a pilot program is the Neuse River.

Lang said the state is looking at both point and non-point sources of nutrient pollution, and each industry, including turfgrass, is being asked to develop its own plan to reduce it.

NCSU turf researchers recognized this problem before it became an issue, and initiated water quality studies on its research farm about five years.

"Industry (turf) is supporting the big push on water quality," added Art Bruneau. "Industry wants to do what's right too."

To learn more about turfgrass in North Carolina, consider attending the Annual NCSU Turf and Ornamental Field Day on May 20. For more information, contact the TCNC at 1-910-695-1333.

—by Ron Hall

AgriBioTech buys more turfseed firms

LAS VEGAS—AgriBioTech, Inc. (ABT) is ahead in its stated goal to control 45 percent of the \$1.1 billion U.S. forage and turfseed market by December 31, 2000. In fact, Chairman and CEO Dr. Johnny Thomas recently told shareholders that ABT will accomplish that by year's end—two years ahead of schedule.

His comments came just weeks before his company announced the pending purchase of four more seed companies. It signed letters of intent to buy: Peterson Seed Co. Inc., Savage, MN; Geo. W. Hill & Co, Inc., Florence, KY; Fine Lawn Research Inc., Kentucky and Oregon; and Geo W. Hill of Indiana Inc., Elwood, IN. The four companies have combined annual sales of about \$37 million.

Peterson specializes in alfalfa, other forages and turfgrass distribution in the East and Midwest. They also have a seed-coating plant and licenses to unique germ plasm. Hill-KY, Hill-IN and Fine Lawn share some common ownership and, as a group, specialize in the distribution of turfgrass seeds, forage seeds and ancillary product distribution. All fine owners, including Jerry Peterson, will sign employment agreements with ABT.

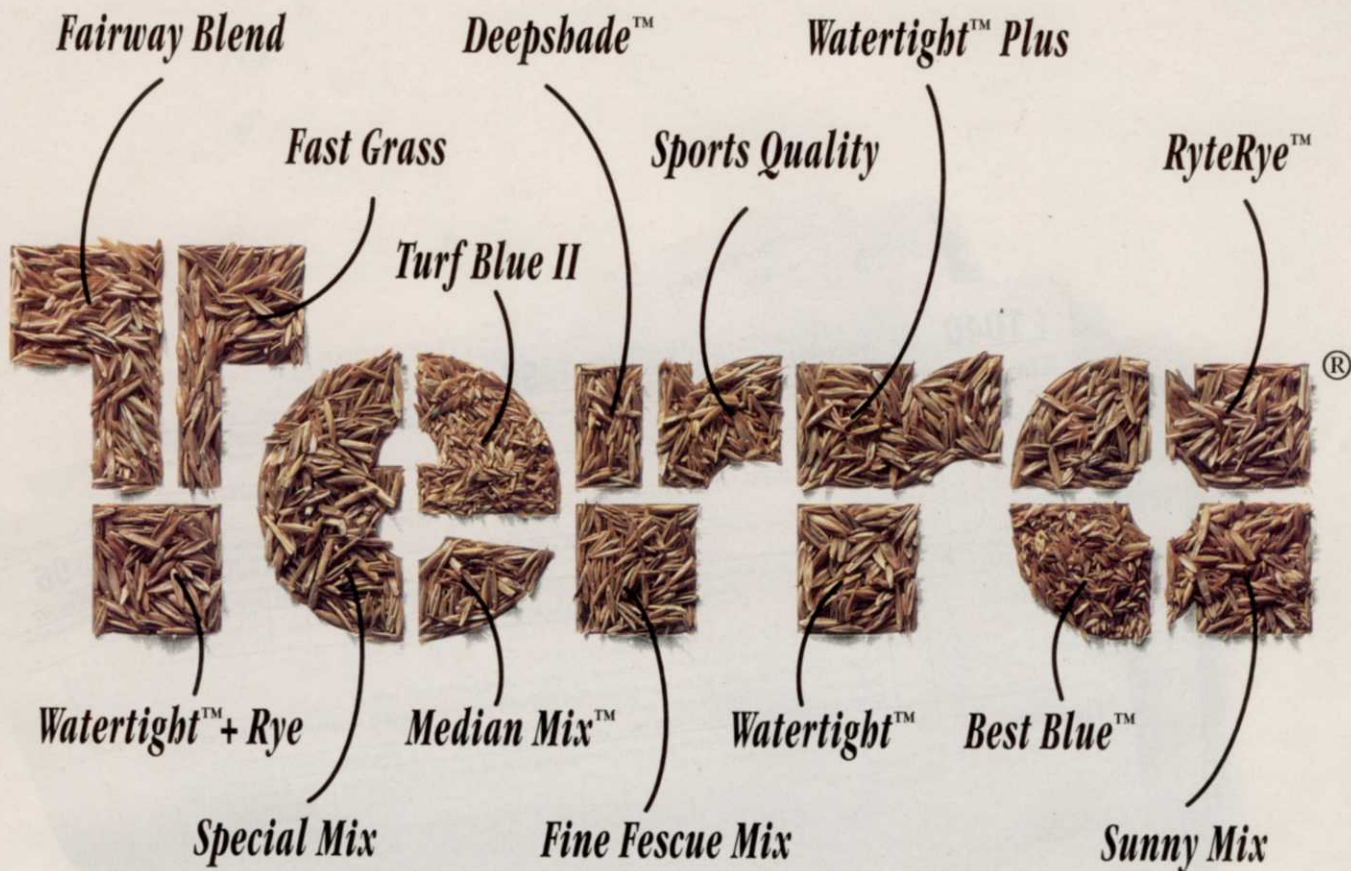
In just three years—since January, 1995—ABT has completed 18 acquisitions and is now the largest forage and cool-season turfgrass seed company in the United States with sales of about \$409 million, including the above four acquisitions and the previously pending acquisition of Zajac Performance Seed, Ohio Seed Co., Van Dyke Seed Co. Inc., Las Vegas Fertilizer Co. Inc., Kinder Seed Inc., and Willamette Seed Co.

On January 13 ABT completed the purchase of Seed Corporation of America with net sales of about \$40 million and, on January 7, the purchase of Lofts Seed Inc. with annual sales of about \$75 million.

Just two months prior to that, on November 20, Kent Shulze joined the company president and COO, and Dr. Thomas B. Rice as vice president, director of research. Both are experienced and well known in the seed business.

Shulze served as president and CEO (1990-1996) of Northrup King Co., Minneapolis, then an operating unit of Sandoz Seeds. Prior to that he was president and COO of Dekalb-Pfizer Genetics, Dekalb, IL.

Dr. Rice had also previously been with Dekalb Genetics where he served as director of research for 10 years. He was the chief architect of the company's biotechnology strategy. □



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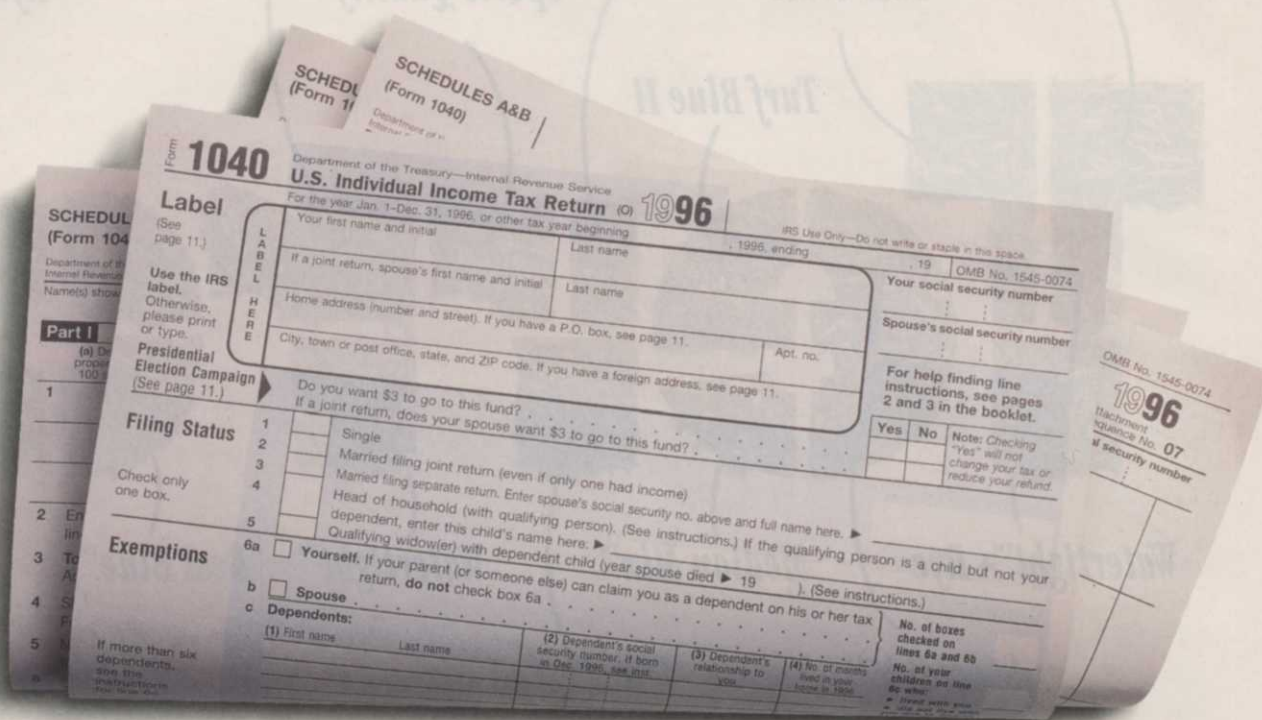
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By STEVE & SUZ TRUSTY

the time period you want without tying up financial resources for the total price of the unit.

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"I base my lease or buy decisions on the estimated life of the equipment, the availability of cash flow and the advice of my accountant on the tax ramifications of the decision," says Nick Stipanovich, owner of Nick's Lawn Service, Merritt Island, FL. "There may be times when there's a greater tax advantage

for our company in making a capital purchase and reducing retained profits by that amount than there is in leasing and depreciating the lease value.

"The number one aspect of leasing is I don't have to put up a lot of my money to get into the equipment I want. The initial payment on equipment is generally in the range of the regular payment on that unit.

"Leasing also allows me greater control over my cash flow. When it comes to a \$40,000 or \$50,000 machine, I can sign the lease agreement and make the initial payment at the end of March. The machine is mine to use from the date the agreement is signed. The first regular payment would then come due at the end of April. That control is really important when you're leasing equipment for a job you're just beginning and won't receive payment on until later."

Stipanovich adds, "most of our equipment lease agreements are set up similar to a bank loan, but with a dollar buy out at the end of the lease period. Because technology is moving so fast in this industry, I like the flexibility leasing gives me to move up to a faster, better unit at any point in

the life of the lease without making a major impact on my cash position."

Dave Herman, superintendent of Heritage Highlands Golf and Country Club, Tucson, AZ, says, "we lease so we can get the best equipment for the least amount of money upfront. With traditional purchasing on a golf course you have equipment on three- to five-year cycles. When those machines need replacement, you're facing a huge capital expense. With leasing, we have equipment on three-, four- and five-year leasing programs: the smaller mowers on three-year leases, the Gators on four-year, and the larger tractors and other units on five year.

"At the end of the lease period we have the option to extend the lease for an additional year, buy it out at the pre-determined price point, or tell the company to take it away. We can start another lease on a new machine at that point, with a minimal initial payment."

Gary Tungate, vice president and regional manager for the Southeastern US offices of Environmental Services/Environmental Golf/Valley Crest says, "our company has found it