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Moving to the Front of the Class — Again

The Joseph Troll Research Center was named after a longtime professor at both schools.

By Anthony Pioppi, Contributing Editor

Massachusetts turfgrass programs get high marks for their improvement

The education of golf course turfgrass professionals has a long history in western Massachusetts. And after years in the doldrums, the programs at the University of Massachusetts-Amherst and the Stockbridge School of Agriculture are making comebacks.

It was 1927 when Lawrence Dickinson started teaching the first college program in the United States, specifically for those maintaining golf course turfgrass. The 12-week Winter School for Greenkeepers and Golf Course Foremen was part of the turf management program at the Massachusetts Agricultural College, a land-grant university now known as UMass-Amherst.

The program, which still exists, led to the creation in 1945 of a two-year turf managers program at the Stockbridge School of Agriculture, which is part of UMass and located on the Amherst campus. In 1961, the state legislature made it an associate degree program after lobbying by students.

In the 1980s, Stockbridge and UMass were among the premiere programs in the country, producing graduates year after year that went on to maintain fine turf at some of the most acclaimed golf courses in the country. But the programs lost their collective ways over the years. While more universities and colleges added turf programs that concentrated not only on producing future superintendents, but also on research and turf breeding, the Massachusetts schools never made those areas a priority.

Now, though, thanks to the foresight of one man and the support of loyal graduates, UMass and the Stockbridge School are once again moving to the head of the class and for the first time that means serious research by a number of prominent scientists in the expanded departments.

Steve Goodwin is dean of the College of Natural Sciences at UMass, and it's through his college that a student can earn a bachelor's, master's or doctorate degree in a turf-related concentration. While Goodwin is leading the rebirth of

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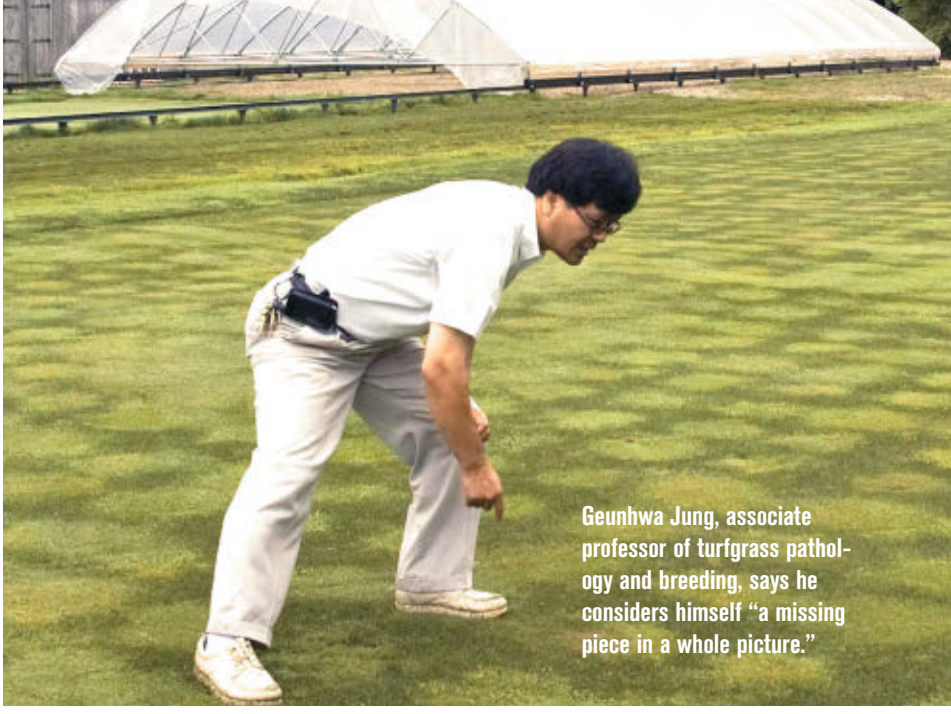

Geunhwa Jung, associate professor of turfgrass pathology and breeding, says he considers himself "a missing piece in a whole picture."

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the program, he and others say much of the credit goes to his predecessor, Cleve Williams, who now holds the title of special associate with the college. Williams was dean from 2000 to 2007.

When it was decided the program needed an upgrade, Williams told a group of faculty, administration and influential alumni, "We're going to have the best program in the country."

"That's the phrase that changed everything around," says William Mitchell, director of the Stockbridge school.

One of the first goals was to build a 3,000-square foot research facility at the turf plots in nearby South Deerfield, Mass., to replace what was literally an embarrassingly dilapidated trailer. About $1 million was raised through donations and the Joseph Troll Research Center, named after a longtime turf professor at both schools, opened in 2005 and is the centerpiece of the site.

Acquiring the money was no easy task, Williams says. Many who had come through UMass and Stockbridge and were still in the golf business had little good to say about the state of the two programs.

"It was slow going, and we had to listen to those people," Williams says. "They didn't sugarcoat it."

Williams says that many of the changes made in the department were a direct response "to conversations we had with the turf industry."

That includes more involvement on the regional and national levels. For instance, after years of absence at the Golf Industry Show, the schools again have booths and participate in the annual Turf Bowl.

There are about 225 students enrolled in the Stockbridge School of Agriculture, with about 40 percent concentrating in turfgrass management. About 50 percent of those turfgrass students will pursue four-year degrees through UMass-Amherst. Stockbridge also offers concentrations in equine industries, fruit and vegetable crops, horticulture, landscape contracting and arboriculture, and forestry.

The UMass turf program is achieving new heights as more professors and researchers were hired to join longtime faculty members such as Pat Vittum, Ph.D., whose extensive research with annual bluegrass weevils has made her a sought-after speaker throughout the Northeast and beyond. She is also chair of the UMass Turf Bowl Team. In addition, there's Geunhwa Jung, Ph.D., the graduate program director

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of plant and soil sciences and associate professor of turfgrass pathology and breeding. He earned his doctorate in breeding and genetics from the University of Nebraska-Lincoln in 1995. Prior to joining the UMass faculty in 2006, he was an assistant professor in the plant pathology department at University of Wisconsin-Madison.

Jung describes his focus, a first for UMass, as "research on turfgrass improvement with multiple resistance via breeding and molecular genetics, and on development of disease control and fungicide resistance-management strategies using genetic principles and tools."

Jung says he also enjoys his role of helping the programs expand. "I consider myself as a missing piece in a whole picture," he says. "That's another way of satisfying my passion and interest in sciences."

Jung was joined by, among others, assistant professor of turfgrass physiology Michelle DaCosta, who's working on determining drought capabilities of turf varieties. Her work utilizes a one-of-a-kind automatic sliding canopy to keep rainfall off the 35-foot by 65-foot site that moves into place at the first drops of precipitation.

DaCosta earned her Ph.D. from Rutgers in 2006 and admitted to having some hesitancy when coming to UMass for an interview, having been told how the school's standing had dropped.

"Everyone I talked to had said that, but I came here and saw so much enthusiasm," she says. "It didn't look like that was the direction the program was going."

Those inside the university, beyond the agriculture programs, also seem to be noticing the improvement. In 2006, Sherwood Moore, a 1937 graduate of Stockbridge, was awarded an honorary doctorate from UMass, believed to be the first superintendent in the country to receive that accolade from any school.

Then in 2009, golf course architect Brian Silva became the first graduate of either school to be named an Eleanor Bateman Scholar in Residence at UMass. The program is designed to promote interaction between students and distinguished alumni.

Silva earned an associate's degree in turf management from Stockbridge and a bachelor's in landscape architecture from UMass.

"I'm thrilled to see the turf programs revitalized with new energy and focus toward not just producing qualified superintendents, but also advancing the overall knowledge of the turf industry," Silva says. ■

Pioppi is a contributing editor for Golfdom.

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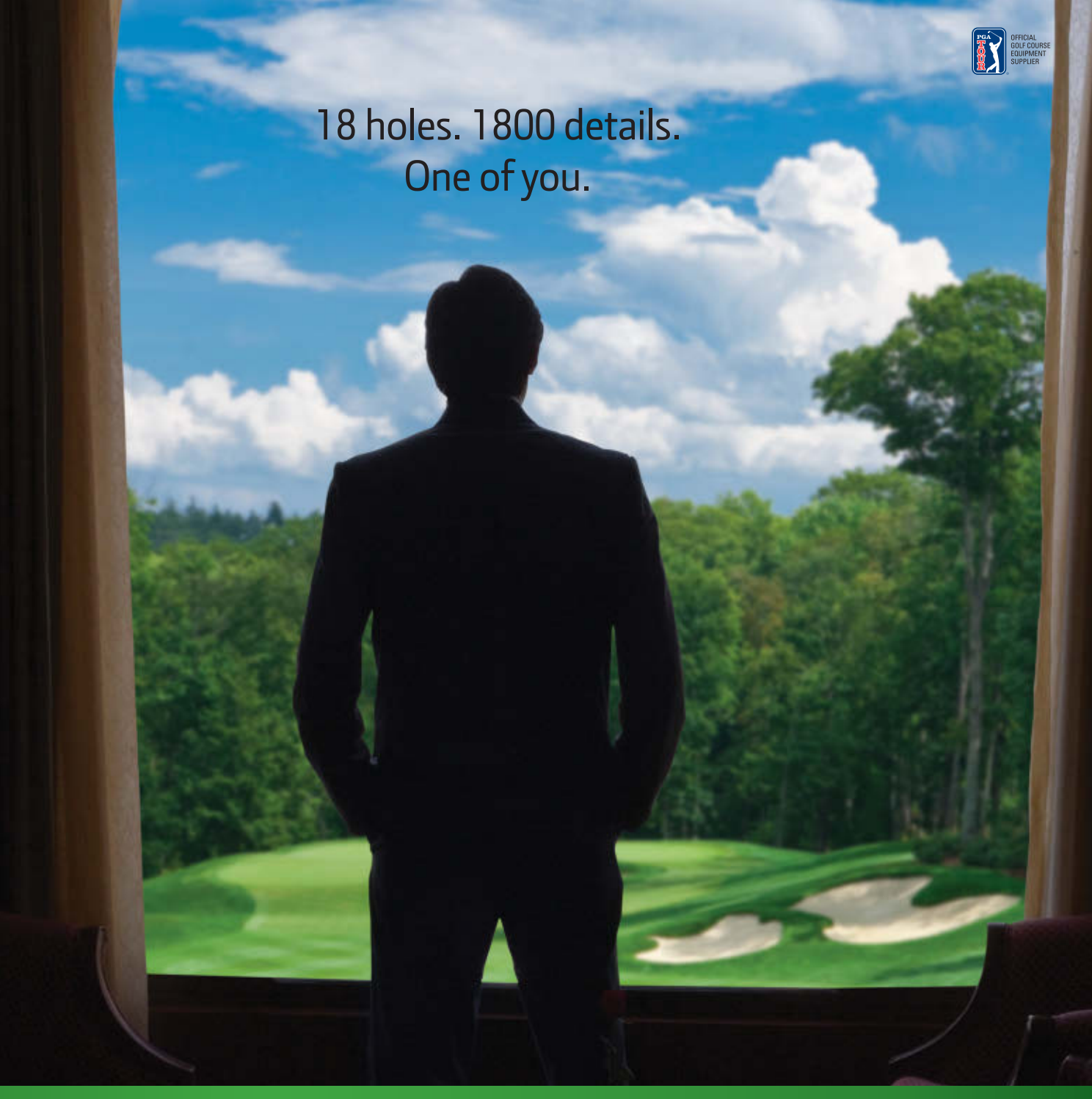

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TURFGRASS TRENDS

LOW-MAINTENANCE TURF

There's a New Native Low-Input Turfgrass Option in Town

Danthonia promises lower inputs

By Scott Warnke

When it comes to low-maintenance, cool-season turfgrasses, golf course superintendents don't have many choices. Tall fescue is often thought of as a low-maintenance turfgrass. However, the fertility and fungicide applications needed to maintain acceptable quality can be higher than would be desired in a low-maintenance turf.

The only other option would be fine-leaf fescues and, while they typically require very few inputs, their appearance is objectionable to some. This shortage of options led scientists working for the U.S. Department of Agriculture's Agriculture Research Service (USDA-ARS) to look into the development of new low-maintenance turfgrasses. Exploration of turf areas that receive very few inputs, such as battlefields, graveyards and public gardens in the Maryland, Virginia, Washington, D.C. area, identified species in the genus Danthonia as potential native low-input turfgrasses.

The genus Danthonia is comprised of more than 100 species that are primarily native to temperate regions of the Southern hemisphere, where they are important forage grasses.

About six species of Danthonia are native to the United States, with *Danthonia spicata* (poverty oatgrass) being the most widespread. The common name, "poverty oatgrass," resulted from the fact that its presence in an area is considered an indicator of impoverished or low-fertility soils. *D. spicata* is widespread throughout the continental U.S. and Canada. However, the species has not been widely collected or studied. Previous research has focused on its reproductive biology because it has the unusual ability to form two types of seed heads.

The development of this unique seed production characteristic may have originated from the interaction of *D. spicata* with a choke-forming fungal species (Atkinsonella hypoxylon). Choke occurs when the fungus forms a fruiting body around the tiller and chokes off the production of the terminal seed-head. However, D. spicata can still form seed at the nodes of the tiller.

Our research efforts with Danthonia have involved the collection of plant material and seed from native stands throughout the Maryland, Virginia and Washing-

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IN THIS ISSUE

Getting to the Roots of Nitrogen-Use Efficiency
Nitrogen is the most abundant mineral element in turfgrass and is consequently the fertilizer nutrient most required for turf management. But nitrogen use in turf management has become a concern at community, state and even national levels, which is unfortunate, writes Richard Hull.....51

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***Danthonia spicata* produces two different seed heads. The seed head on the right is a typical terminal seed head and the seed head on the left is produced at the nodes of the flowering tiller.**

PHOTO COURTESY: SCOTT WARNKE

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ton, D.C area. We're using this material to study the amount of genetic diversity present and to determine how that diversity is partitioned. If the genetic variation is primarily between locations with very few differences between plants at a specific location, this is an indication that the plants are primarily self-fertile and that only limited amounts of outcrossing occurs. Initial results have indicated high levels of self-fertility. Therefore, we're designing breeding strategies that involve crossing plants collected from different locations in order to see if material with unique characteristics can be developed.

The focus of our initial improvement efforts is on seed characteristics such as resistance to shattering that occurs when seed falls from the seedhead prior to harvest. Shattering is a common characteristic of wild weedy grass species and will need to be improved before commercialization.

Seed dormancy is also a concern and various seed treatments are being evaluated in an effort to improve the speed and uniformity of germination.

Leaf spot diseases are common in some material. However, there appears to be some variation for resistance so it will be necessary to incorporate this resistance into newly developed material. The leaf spot problem is not widespread, and I don't expect it to be a difficult problem to solve.

Our first seed established turf trials focused on determining an appropriate seeding rate and the results indicated that an acceptable turf could be established with seeding rates at or below 1 pound per 1,000 square feet.

In addition, we have looked at mixtures with hard fescues because D. spicata is often found associated with hard fescues in nature. Both D. spicata and hard fescues are extremely shade tolerant and the mixture seems to enhance the overall appearance of both species. However, we don't have enough data from plots of this mixture to make any recommendations.

Future research efforts will involve comparisons of the overall level of inputs required to maintain an acceptable turf of D. spicata and other common cool-season turfgrass species such as ryegrass, tall fescue and fine fescues.

The focus of the USDA-ARS breeding efforts with turfgrasses is to do the difficult, time-consuming work required to make a new species useful for commercial turfgrass breeding companies. Breeding companies will then do the work that's required to create products for golf courses and other consumers.

Germplasm collection and the improvement of seed characteristics are projects that may pay off in a useful product, but are considered too risky and time consuming for commercial turf breeding companies. The long-term goal of this work is to create new native, low-maintenance turfgrass options for consumers that enhance the beauty and sustainability of our landscapes.

Scott Warnke, Ph.D., is a research geneticist with the U.S. Department of Agriculture's Agriculture Research Service USDA-ARS. He has extensive experience in turfgrass genetics and breeding research. Currently, he is conducting research on the genetic improvement of stress tolerance and reduced input sustainability in turfgrasses with an emphasis on the genetic mechanisms of resistance to biotic and abiotic stresses, development of genetic markers, and the development of alternative low maintenance turfgrass species. He is at Scott.Warnke@ARS.USDA.gov.