Jackson Country Club, Carbondale, Ill., gets a fairway facelift using new Southern Illinois University seeding technology.

Found: a technique to seed zoysiagrass fairways

by Jerry Roche, editor

Brice Gordon took one look at Jackson Country Club's golf course and shook his head.

His early enthusiasm tempered, he now wasn't sure whether he wanted the superintendent's job that he was interviewing for. Jackson's bermudagrass fairways, destroyed by a frigid winter, needed work.

"They were real honest about the shape of the course when they brought me here for the job interview," Gordon remembers. "The thing that impressed me was the willingness to help and the enthusiasm of the greens committee."

Gordon took the job. And, despite a limited budget, the greens committee voted to improve the course.

Jackson is a typical transition zone course located midway between Carbondale and Murphysboro in the middle of southern Illinois' sprawling corn belt.

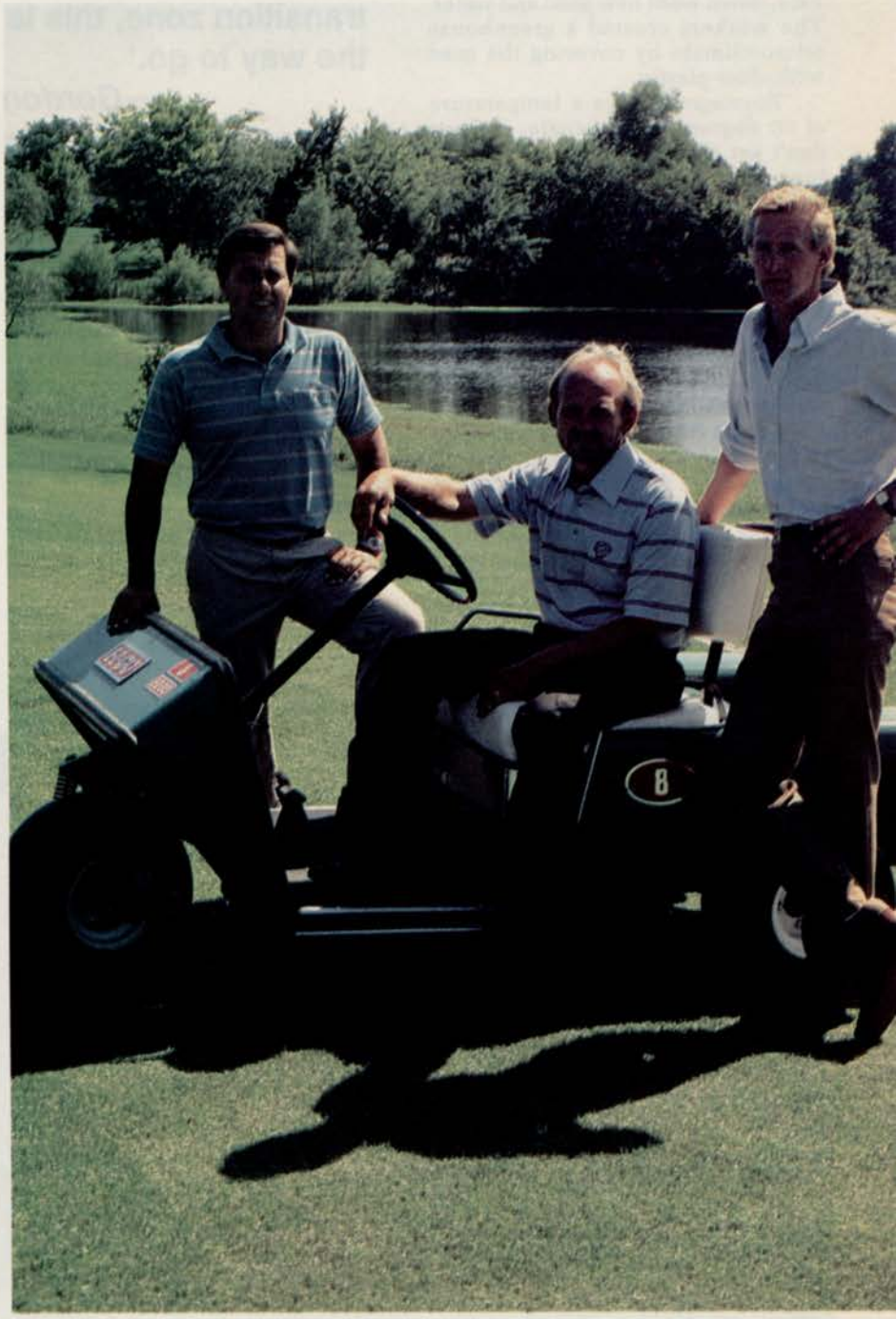
"One winter it can be like summer, and the next year the cold weather can nail you," says Gordon. "Nobody knows what the weather is going to do."

In the transition zone, Kentucky bluegrass and/or perennial ryegrass can be used, but must be cut high (1 to 1½ inches) to survive summer's heat and humidity. Bermudagrass turns off-color in the fall and faces the danger of winter kill.

Dr. Herbert Portz, familiar with the course because of the research he'd done there, suggested a fairway facelift with zoysiagrass. Zoysia is both winter hardy and drought tolerant. Mike Dozier, a graduate student of Dr. Portz's at Southern Illinois University, also joined the team.

"We originally proposed doing two or three fairways," remembers Dr. Portz. "Mike was a super-salesman, though, and the greens committee said they wanted to go all the way."

They decided against Meyer zoysia. Too expensive. Instead they would go with Korean common zoysia. And, not wanting to close the course down for a lengthy period,



Taking it easy *on one of the zoysiagrass fairways at Jackson Country Club are, left to right: Mike Dozier, Brice Gordon and Steve Glodo.*

they would use a new early-establishment seeding process which Dozier was working on.

(Normally, proprietary zoysiagrass like Meyer is established in one of four ways: plugging, strip sodding, row planting or hydrostolonizing. Strip sodding is the most common for golf courses, but expensive. Jackson didn't have that money to spend.)

The big test

Using 70,000 square feet of fairways as a test, workmen killed the existing turf with glyphosate. On April 26, 1984, down went new seed and water. The workers created a greenhouse micro-climate by covering the seed with clear plastic.

"Zoysiagrass takes a temperature of 90 degrees to germinate, and we don't get that kind of weather until June around here," Dozier notes. "But that's the dry season. By using the clear polyethylene cover, we get a six- to eight-week head start. We left the plastic on for two weeks."

Twenty five volunteers stretched $4,000 worth of plastic into place. Temperatures under the plastic at times soared to 140 degrees, but the seed germinated.

"We got 80 to 90 percent coverage in nine to 10 weeks with the plastic," says Dozier. "Without the plastic, it probably would have taken a year or more for that kind of coverage."

Using other zoysia establishment procedures, 100 percent cover takes three to five years. The Jackson Country Club people hope for 100 percent cover by the end of next year. Problems surfaced however.

"Execution of the seeding on 12 acres was not as good as it had been on the research plots," notes Dr. Portz. "That's simply one of those things you have to watch out for.

'For clubs on low budgets in the transition zone, this is the way to go.'

—Gordon

"One of the problems was that some seed didn't get in contact with the soil because there was so much dead matter left. You have to go over it two or three times with a verticutter or Fuerst harrow. They rushed it when they did the first nine, but will correct that on the other nine."

Greens chairman Steve Glodo says "the course was never taken out of play and the price was much less expensive."

Even though Korean common zoysia seed is about $18 a pound because it is hand-harvested in Korea, the total price of the first nine-hole project was less than $25,000, compared to the $75,000 to strip sod Meyer zoysia. "For clubs on low budgets in the transition zone, this is the way to go," says Gordon.

A long-term solution

"We think this is a long-term solution," Gordon continues. "We don't know what diseases or insects will get to the grass, but we have high hopes. It's not the perfect answer, but it looks good." The final nine holes will be seeded with zoysia next year.

Dozier was asked why no one has ever tried this before.

"First, Korean common is not a fine enough textured grass for tournament courses, but it's okay for courses like Jackson," he noted. "Secondly, nobody thought you could work with plastic on such a big scale."

Korean common zoysia is not as dense or tall-growing as Meyer, but neither is thatch as much of a problem. It's also slower to establish, but the plastic solved that problem.

Gordon keeps it mowed at ¾-inch on the fairways and 1¼ inches in the roughs.

"We've not had any complaints from the members," Glodo says. "When we had the bermuda, we had been playing off nothing from June to September. And when the golfers saw what the end product could be from the test plots, we didn't get a lot of flack." **WT&T**

The 12th fairway, *the left half of which was seeded last summer and the right half which was seeded in June, 1984.*

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85-51

A handy gadget for care of small landscape areas

Knapsack sprayers allow landscape managers of small areas to apply liquid pesticides where dry products were previously used.

by Patrick G. Tvrdy

Knapsack sprayers can be a grounds manager's solution to many pesticide application problems. They are economical and efficient when used for specific tasks.

For example, a 40-degree spray angle tip can be used to deliver a total vegetation control herbicide in a three-inch-wide band along a sidewalk. The 40-degree tip, as opposed to an 80-degree tip, reduces the chances of a significant change in the spray pattern through an inadvertent but small change in nozzle height.

The function of any sprayer is to deliver the correct amount of chemical to a particular target. To operate one efficiently a user must calculate operating pressure, nozzle selection, recommended carrier volume, and chemical rate.

The right pressure

Operating pressure is vital in chemical delivery. Too much pressure and the nozzle creates a pattern composed of many small, fine particles. These particles drift to unintended areas and threaten desirable plants and/or animals.

Too little pressure and the nozzle doesn't penetrate the plant canopy. The pesticide doesn't reach the target pest.

The addition of a pressure regulator to the knapsack sprayer delivers the chemical at a constant rate, increases the accuracy of spraying, and in some cases, reduces constant pumping of the spray unit.

Patrick G. Tvrdy is technical service representative for Tri-Sentry Chemical Corporation in Lenexa, Kan.

CALIBRATION OF MULTIPLE NOZZLE SPRAYERS

$$\left[\left(\frac{\text{Time to walk 100 ft.}}{\text{Time to collect 1 pint} \div \text{Number of nozzles}}\right) \times \left(\frac{435.6}{\text{Spray Width in ft.}}\right)\right] \div 8 = \text{Gallons Per Acre}$$

CALIBRATION OF SINGLE NOZZLE SPRAYERS

$$\left[\left(\frac{\text{Time to walk 100 ft.}}{\text{Time to collect 1 pint}}\right) \times \left(\frac{435.6}{\text{Spray Width in ft.}}\right)\right] \div 8 = \text{Gallons Per Acre}$$

CALCULATION OF SPRAY CARRIER VOLUME

$$\left(\frac{\text{Desired area to be sprayed}}{43{,}560 \text{ sq. ft.}} \times \text{Gallons Per Acre}\right) + \text{Sprayer Waste} = \text{Spray volume/area}$$

CALCULATION OF CORRECT CHEMICAL VOLUME

$$\left(\frac{\text{Desired spray tank liquid volume in gallons}}{\text{Gallons Per Acre}}\right) \times \text{Recommended Rate Per Acre} = \text{Amount of chemical in the desired spray tank liquid volume}$$

The four calibration formulas *(above) were developed by Tvrdy in response to inquiries from turfgrass managers on the correct use of knapsack sprayers in pesticide application.*

Nozzle selection

Don't overlook nozzle adaptability of a knapsack spray unit you're considering. Some come with an adjust nozzle permanently attached to the end of the spray wand. These sprayers limit methods of operation. A user's options are decreased.

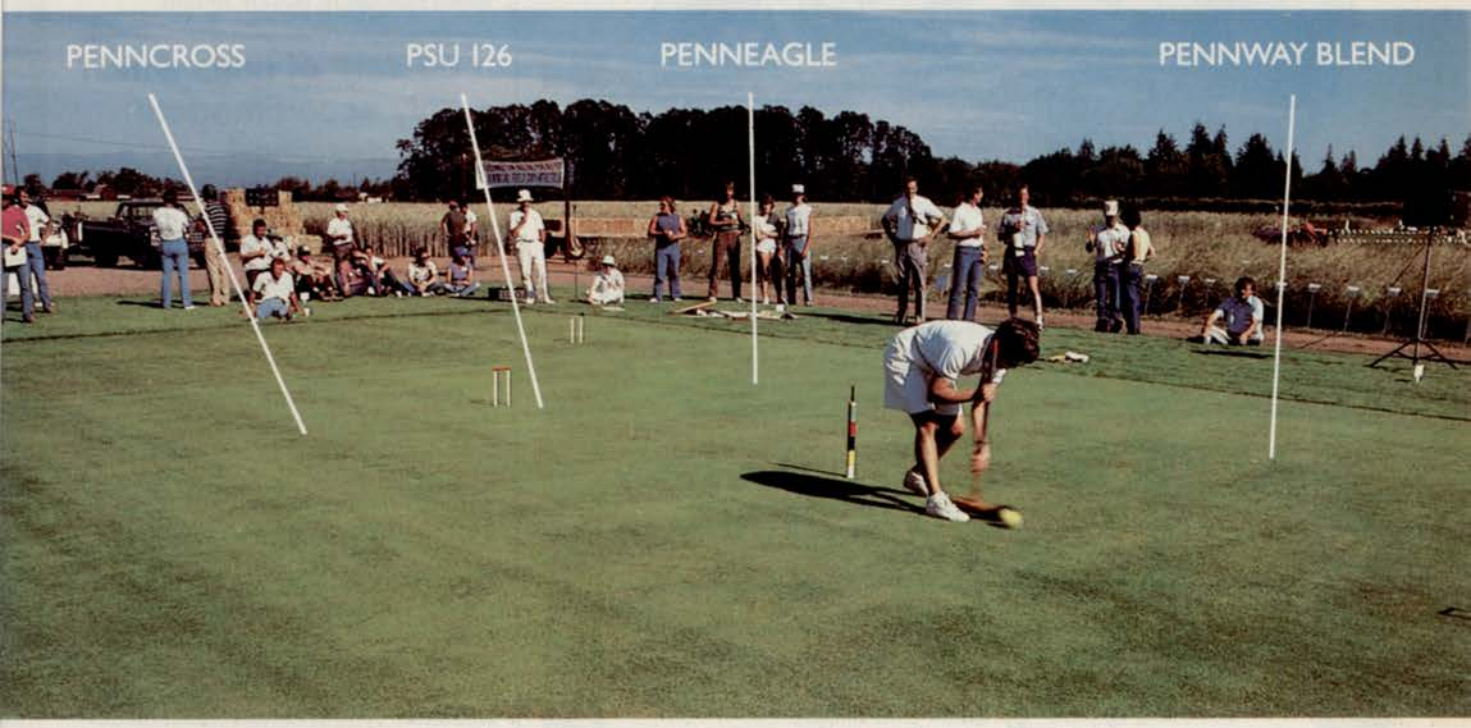
Beware of units which only accommodate tips designed specifically for those units. Replacement nozzles may be hard to find and the range of patterns and gallons-per-minute delivery rates may not suit your jobs.

The nozzles needed for your job depend upon the types of chemicals, gallonages, spray patterns, and spray widths.

For example, a 40-degree spray an

Continued on page 36

The Penn Pals are 'Tried and True'



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GADGETS *from page 34*

gle tip can be used to deliver a total vegetation control herbicide in a three-inch-wide band along a sidewalk. The 40-degree tip, as opposed to an 80-degree tip, reduces the chances of a significant change in the spray pattern through an inadvertent but small change in nozzle height.

Beware of units which only accommodate tips designed specifically for those units. Replacement nozzles may be hard to find...

However, in some instances, a 80-degree tip is advantageous. With it an operator can apply a chemical in a 12-inch-wide band along a fence line without having to hold the wand so high that spray blows off target.

Carrier volume

Carrier volume is the amount of liquid needed to move a pesticide from the sprayer to the target. It is determined by operating pressure, nozzle selection, type of carrier, label recommendations, and the operator's walking pace.

Spray carrier volume varies among products. Having nozzles with several different gallons-per-minute delivery rates equip an operator to meet a manufacturer's recommendations for each particular chemical.

For example, if a sprayer is designed to deliver 30 gallons to the acre, and a 15-gallon-per-acre chemical is used, the operator, by simply changing the nozzle, can spray twice the area at the same volume.

Correspondingly, the initial area could be covered with half the volume.

Other tips

Knapsack sprayer users should also consider:

Chemical rate: The chemical rate depends upon the manufacturer's labeled recommendation for their product. And the desired end result.

Proper set-up: Years ago, a user performed complicated math formulations to determine a sprayer's carrier volume and chemical rate.

The cumbersome formulas often led to over-application. This increased cost. **WT&T**

Frank J. McDonald, Director of Marketing
Cushman Division, Outboard Marine Corporation
Lincoln, Nebraska

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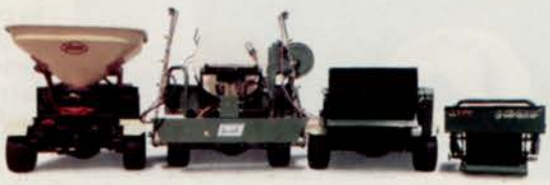

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WT&T's travelin' show

This fall we took to the road to find out what you're up to. Here's our report.

by Ken Kuhajda, managing editor

Four separate events. Four different sites. One constant: the flow of information.

In Wisconsin, we perused John Deere's new and upgraded products for 1986.

At the jointly sponsored Michigan State University/Michigan Turfgrass Foundation field day, we examined plots at one of the most prestigious turf schools in the country.

Cornell University's turfgrass and woody ornamental field day featured distinguished horticulturists addressing a variety of topics.

Beautiful Virginia proved an ideal setting for the informative Virginia Tech turfgrass field days in Blacksburg.

Deere: '86 and beyond

As John Deere heads for its 150th anniversary (1987), it's not anteing and folding.

Deere announced new homeowner and commercial products to more than 3,000 dealers and salespeople during three weeks of meetings ending in late September.

Promising "dramatic changes" for its 1986 consumer product line, Deere also made changes geared for the commercial audience.

On the consumer front, ten 21-inch walk-behind mowers replace four current models. Deere says they provide a greater selection of features including both two- and four-cycle engines, rope or electrical start, and a six-quart auxiliary gas tank.

Deere debuted some 20 new products to dealers including:

- Three hydrostatic drive compact utility tractor models;
- Two diesel-powered commercial front mowers along with five implements; and
- Three skid-steer loaders, all with vertical path booms.

Since entering the commercial market in 1983, Deere has purchased a 20 percent interest in the Bunton Company, a manufacturer of commercial mowers.

John Deere personnel *attach the Power Flow bagging system to a lawn tractor.*

MSU: turf and more turf

The foliage in East Lansing, Mich., home of the Spartans, was appropriately colored deep green during Michigan State University's turfgrass field day held in early September at the Robert W. Hancock Research Center.

One report in particular grabbed our attention.

B.A. Montgomery and J.M. Vargas Jr., MSU turf pathologists, are developing a computer model that predicts when summer patch outbreaks will occur and how severe they will be.

The disease, caused by the root-infecting fungus *Phialophora graminicola*, caused severe late-season turf loss on annual bluegrass (*Poa annua L.*) fairways throughout the Midwest in 1983 and 1984.

The prediction model, say the researchers, will be available in a microprocessor for access and use on the golf course.

Data should allow both small-budget and large-budget superintendents to combat the disease.

Superintendents with large fungicide budgets will be able to treat fairways just prior to a disease outbreak.

Those with smaller budgets can inform their membership of an impending outbreak even if finances prevent treatment. It tells members, "I'm

Cornell's Dr. Marty Petrovic *speaks on the AREST facility.*

Former Cornell professor Dr. Richard Smiley *addresses the subject of patch diseases.*

aware of what's going on."

The researchers are developing the program by monitoring the environmental factors (soil moisture, temperature, oxygen diffusion rate, air temperature, relative humidity) that lead to summer patch on golf course fairways.

Data was to be available sometime this fall.

Another MSU experiment involves studies on greens management, specifically the effect of different nitrogen fertilizer programs on Penncross, Penneagle, and Emerald bentgrasses.

The results:

● After four years treatment, there are few observable differences between Penncross and Penneagle plots not receiving traffic.

● Penncross is superior to Penneagle in wear tolerance and general turf quality but is more susceptible to thatch formation.

● Emerald generally ranks inferior to the other grasses and is highly susceptible to dollarspot.

Cornell: the AREST facility

Cornell University's turfgrass and woody ornamental field day in early September dawned overcast and drizzly but the poor weather didn't detract from Ithaca's beautiful countryside—or the presentations of Cornell's all-star faculty.

Of particular interest to WT&T is Cornell's AREST facility (Automated Rain Exclusion System for Turfgrass studies).

This half-completed facility should provide valuable information on water use on turfgrasses and the fate of fertilizers and pesticides.

It should be functional next year and provide several years of research data.

Cornell says it's unique among research centers worldwide for several reasons; one, it's designed to control input of water by excluding rainfall and controlled irrigation.

The facility includes a movable greenhouse (called a rainout shelter) that is activated by rain and shields the plots. Water comes from a separate irrigation system for each of the 27 plots.

The AREST facility features separate drainage systems for each plot. The plots are lined with plastic and contain seven perforated plastic drain tubes, allowing the study of the fate of pesticides and fertilizers as influenced by soil moisture and other treatment variables.

Cornell associate professor Dr. Marty Petrovic says several major projects are planned for the future including the effects of fertility on turfgrass water use.

A second study involved a summary of pathology research on patch diseases. Dr. Richard Smiley (former Cornell prof now with the Columbia Basin Agricultural Research Center in Pendleton, Ore.) and colleagues have theorized on the identity of the pathogens that cause what was once known as Fusarium blight. They have since separated the disease into summer patch (caused by *Phialophora graminicola*) and necrotic ring spot (caused by *Leptosphaeria korrae*).

Some results of the continuing study:

● *P. graminicola* is most active in environments with high temperatures (82-91 degrees, F) and wet conditions.

● *L. korrae* is active over a broader range of temperatures and moistures.

● *P. graminicola* is most aggressive on plants incubated at high temperatures. Data indicate it grew through sod and along rhizomes on plants incubated at temperatures above 70 degrees but only killed plants rapidly when the temperature was 84 degrees and above.

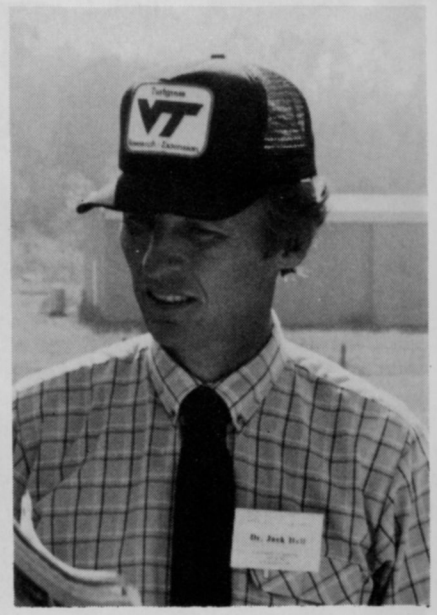
● Shading has a duel influence. At intermediate temperatures, heavy shading increased the disease. ("Presumably by reducing the amount of photosynthetic products moved from shoots to roots, thereby reducing the bility of the plants to replace infected roots," say researchers.) At higher temperatures, heavy shading reduced disease, possibly by reducing the soil temperature and the respiration rate in the root system.

Tech's turf plots

Blacksburg, Va., was an idyllic setting for the Virginia Tech turfgrass field days in mid-September. Blue skies and temperatures near 80 added to the charm of the transition zone area near the Brush Mountains.

"Extending Bermudagrass Growing Season" caught our eye.

Virginia Tech's Dr. Dave Chalmers *makes a point on winter covers for bermudagrass.*



Virginia Tech's Dr. Jack Hall, *a WT&T advisor.*

Tech faculty say the addition of iron fertilizer (in Blacksburg, in late summer and early fall) extends the bermudagrass growing season.

Tech faculty member Richard White (who recently went to Rutgers) says iron fertilizer enhances bermudagrass vigor during exposure to chilling temperatures and can carry color into mid- and even late-October.

However, in northern transition zone areas like Blacksburg daytime highs of around 70 and nighttime lows in the 40s will result in a yellowing bermudagrass.

According to the study (formally titled "the carbon dioxide exchange rate of bermudagrass under chilling stress in response to iron fertilization"), Midiron bermudagrass returned within 70 percent after chilling stress whereas Tifgreen returned to within only 30 percent of pre-stress daytime carbon dioxide exchange rates.

Another study evaluated the effectiveness of covers for winter protection and enhancement of Midiron bermudagrass.

Just prior to dormancy, five-year-old Midiron bermudagrass plots (29 square meters) were covered with Spunbond 110, Spunbond 170, perforated clear plastic, and perforated black plastic (Nov. 1, 1984).

On Nov. 21, 1984, other dormant plots were covered with the same material.

All covers were removed on April 15, 1985. The results:

1) covering bermudagrass for protection against winter damage conditions the grass to tolerate low freezing temperatures and enhances initial spring post-dormancy growth;

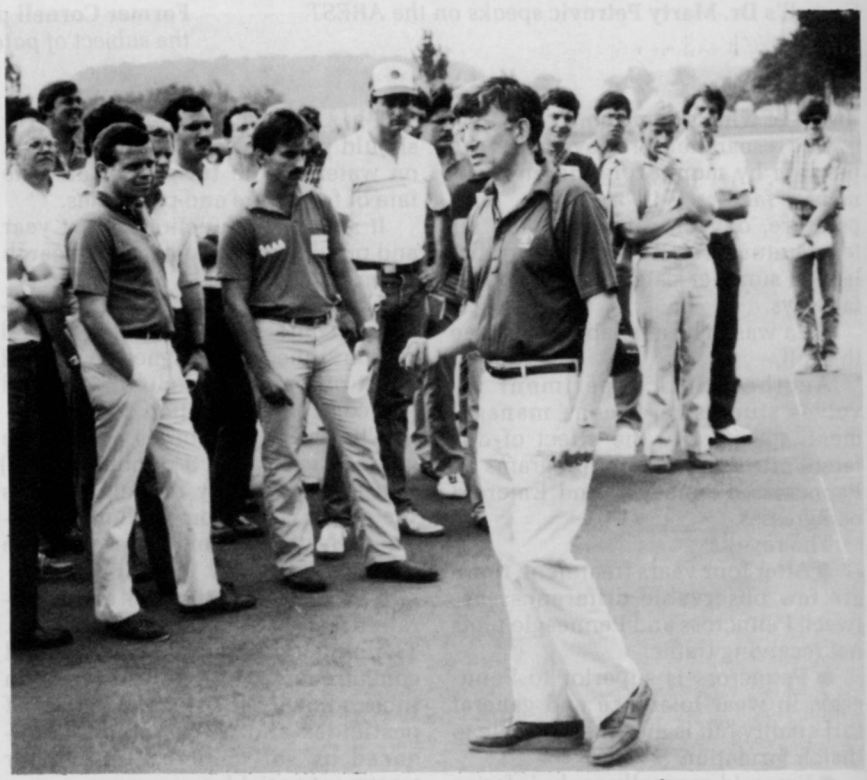
2) installing covers before dormancy, rather than after, causes the grass to retain color longer in the fall and conditions the plants to withstand freezing temperatures;

3) preliminary results indicate covers that permit some solar radiation penetration are most desirable;

4) clear plastic resulted in the best initial post-dormancy growth but lagged in retaining color in the fall when compared to the opaque materials;

5) black plastic covers produced best fall color retention but did not condition the plants to freezing temperatures or enhance post-dormancy growth as well as other covers;

6) the Spunbond covers caused bermudagrass to retain good fall color, conditioned the plants against freezing temperatures, enhanced soil temperatures in winter, and stimulated spring growth. The lighter Spunbond "was somewhat better than the heavy-weight Spunbond." **WT&T**



MSU's Dr. Paul Rieke *talks about management programs for greens.*