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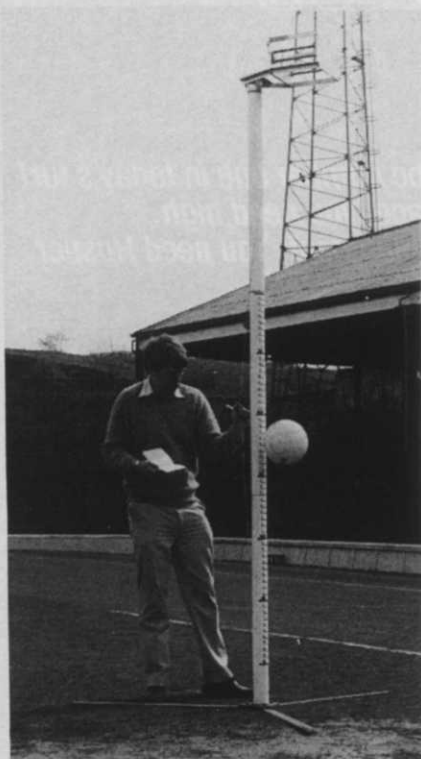
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Ball rebound resistance is measured by dropping a soccer ball from 9.8 feet.

also has a program of research to examine the effects of grass establishment and nutrition on sand rootzones, mechanical treatments, amendments and conditioning materials and use of synthetic reinforcement materials which are intended to increase the wear tolerance of the natural grass surfaces and improve the playing quality.

### Construction techniques

The majority of pitches in Britain either have no drainage at all or just a rudimentary pipe drainage scheme. Slit drainage is widely used for both professional sports grounds and at the local recreational level. Sand-soil mixes have been used by many of the senior professional soccer clubs, but Britain still probably has no more than 50 pure sand rootzone pitches.

Sand-based rootzones have consistently performed well in trial work. Where they have been used, the response has been generally favorable. The construction costs are, however, four to eight times that of a pipe-drained pitch and two to five times that of a pitch with slit drainage.

This additional cost must be justi-



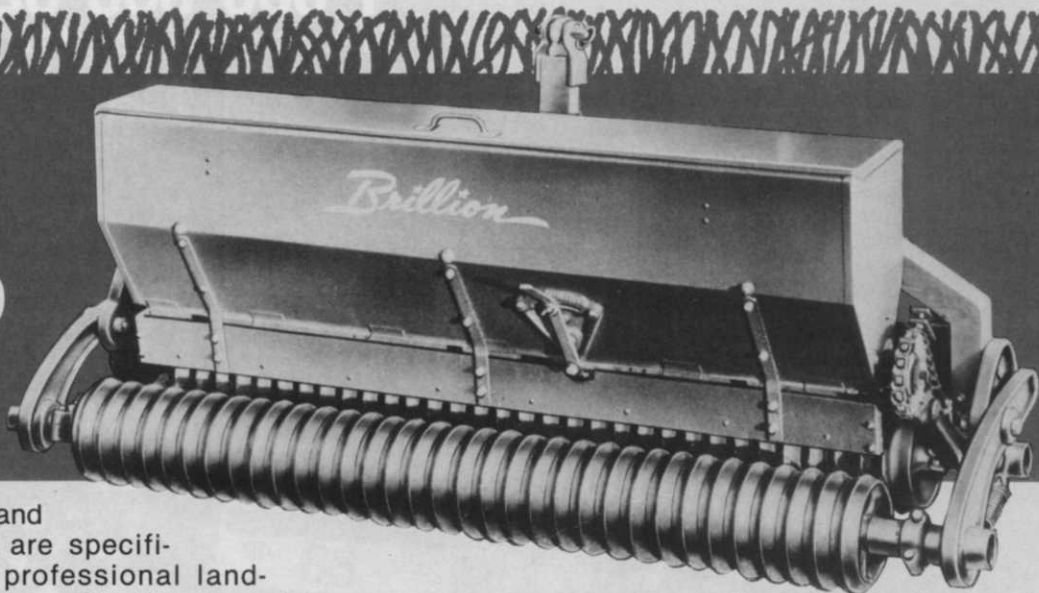
Measuring traction: the force to tear the studs through the grass is measured using a dial-indicating torque wrench.

fied in terms of improved playing performance performance and in the number of games that can be held.

Little published data is available on the relative performance of different construction types. But this is currently being investigated by a trial with simulated wear at the STRI and an extension trial using detailed pitch monitoring.

Principles of construction needed to produce high quality surfaces have been established in Britain. These two trials should give justification for much more widespread use of these drainage techniques. **LM**

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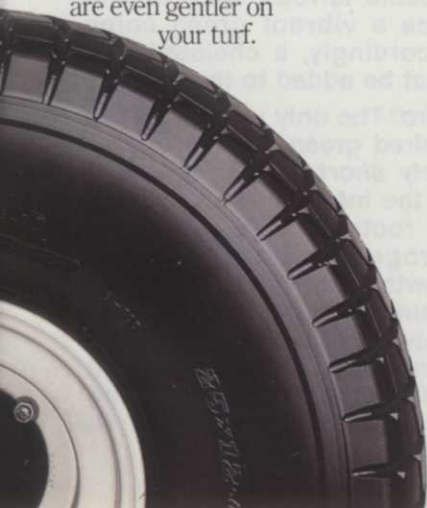
3. Our 50 and 100 gallon boom sprayers from Broyhill are fast and efficient. Use one for herbicides, one for pesticides\* and the grass will always be greener.



4. The rear-mounted, 2000 rpm PTO (Power Take Off) lets you do all of the above.



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Time saving tip: When you're not mowing or spraying, use the Terrapro to get quickly from one part of the course to another. (To prevent unseemly hot rodding by your crew, lock the dual-range transmission in low.)

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# New amine-compatible iron greens up turf in less than 48 hours.

Let us send you a sample of FeRRROME<sup>++</sup>C AC (amine-compatible); test it and see for yourself what a valuable tool it is in the management of turf and ornamentals.



Everett Mealman, President  
PBI/Gordon Corporation

During the last several years, literally thousands of lawn care companies, landscape management contractors, and other turf professionals have been using Ferromec, and their experiences with it have been overwhelmingly favorable. The primary thing they like is the way it greens up turf virtually overnight.

But as they have become more familiar with Ferromec, they have discovered many other reasons for liking it, along with many other places to use it besides on turf grass. Perhaps the most pleasant discovery is the fact that it increases the efficiency of herbicides, and reduces the amount of fertilizer that is normally used.

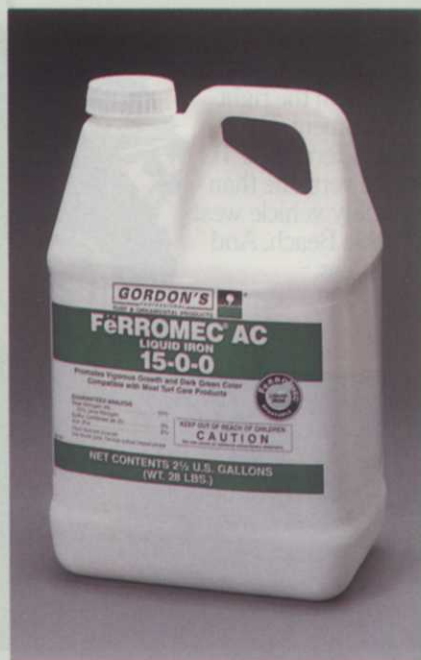
Nitrogen will eventually produce a green color, but excess nitrogen plus turfgrass equals hay. Obviously, Ferromec is a better way!



On the other hand, some lawn care companies have commented that sometimes their employees have had trouble tank mixing Ferromec with multiple components which include an amine herbicide. Obviously, in today's economy if you're a lawn care operator, you'd rather have your people spending their time spraying lawns than worrying about tank mixing instructions, so we turned the problem over to our Dr. Roger Cahoy; as usual he came up with the right solution.

Now, we can offer Ferromec AC which is absolutely amine-compatible and yet is every bit as effective as the original Ferromec.

We want to send you a sample of Ferromec AC, so you can see for yourself what a valuable asset it can be. Meanwhile you might like to review some of the facts about iron which will help you understand how Ferromec works, and why no other company can offer you a product like our patented Ferromec sprayable iron.



## Facts about iron that turf professionals need to remember.

**First:** Iron is essential for the synthesis of chlorophyll. No iron . . . no green.

**Second:** In most instances where ornamental turf is being grown there is not enough naturally occurring iron in a useable ferrous state to produce a vibrant green color. Accordingly, a chelated iron must be added to the soil.

**Third:** The only way to get the desired green color in a *relatively short time*, is to speed up the intake of iron through the roots by feeding enough nitrogen to accelerate the growth rate of the grass. This eventually will bring on the green color. But it will also bring on excessive growth which will cause unwanted mowing and exposure to disease.





St. Augustine grass lawn in Texas showing the darker color (right) produced by Ferromec Liquid Iron applied in early September at 8 oz./1,000 sq. ft. The green-up became visible within 2 hours and the darker color persisted until dormancy, a couple of months later, according to Wallace Menn of Bryan, Texas, a turfgrass specialist who conducted the test.



Half of this green at Hodge Park Golf Course in Kansas City was sprayed with Ferromec and, within 24 hours, the color change was dramatic. Under normal growing conditions, visual response usually occurs between 8 and 48 hours after application. Ferromec is also effective on trees, shrubs and herbaceous plantings.

## FerROMEK<sup>®</sup> is totally different

Ferromec, on the other hand, works in a totally different way. Ferromec is unique. There is nothing quite like it on the market.

It is a patented process that involves bonding a ferrous iron molecule to a urea molecule. When Ferromec is sprayed on turf it is ingested almost immediately via foliar intake at the point where chlorophyll is formed. Once inside the plant, the iron-urea molecular bond

breaks apart because the plant has such a ravenous appetite for nitrogen.

The result is that the iron molecule in Ferromec goes to work almost immediately to create chlorophyll and, depending on the condition of the turf and the weather, the green-up will occur any time within a range of eight to forty-eight hours.

And, of course, the green-up occurs without the excessive growth that would occur if a similar amount of iron was ingested

through the roots along with the nitrogen that would be necessary to allow the iron uptake. Using Ferromec for summer turf is ideal because it reduces the amount of nitrogen you need to apply.

## Special formulas for special problems

Iron is definitely established as an essential micronutrient required by all plants. Yet the amount required can vary dramatically depending on the PH of the soil and the composition of the fertilizer being used.

Furthermore, there are many situations where zinc and/or manganese are required in addition to iron. Accordingly, we have developed special formulations of Ferromec to cover such situations.

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"We put down a total of 8 ounces of Ferromec AC per 1,000 square feet when we prepared the Rose Bowl for the 1987 Super Bowl," says George Toma, noted consultant who has been responsible for preparing the fields of all the Super Bowls played to date. "We'll also use Ferromec AC for the 1988 Super Bowl in San Diego," says Toma.

**G pbi / Gordon CORPORATION**

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# A DIFFERENT ACCENT

Use of ornamental grasses is spreading at a healthy rate across the United States. Perhaps because they're pretty close to the 'perfect ornamental.'

By Jeff Sobul, assistant editor

**R**emember those commercials when the announcer would come on and say, "Be the first kid on your block to have blah, blah, blah."

It's been the same for ornamental grass use during the 1980s, except that the people who sell the grasses aren't trying to sell you a "neat, faddy" piece of junk.

They are trying to sell you a different concept in landscape design. And people who use the grasses rave about them.

One advantage is, after the first month or so, the grasses essentially take care of themselves if you have the proper plant in the proper place. "Their adaptability is clear across the United States," says Michael Hurdzan, Ph.D., a golf course architect with Kidwell & Hurdzan, Colum-

bus, Ohio.

So where have they been all your life? Probably right in your own backyard, or along the highway.

"The problem was that people didn't take the time to learn about them," Hurdzan says. Hurdzan and Richard Hurley, Ph.D., research director for Lofts Seed, are doing much toward correcting that with presentations at turf conferences.

"They are plants that are found in the wild," says Hurley, who did graduate research work on ornamental grasses at Rutgers. In 1979, he started pushing the idea of using them in the landscape. "Their only limit is your imagination," he says.

## A wide variety

"In Europe, ornamental grass use is a matter of fact," says Kurt Bluemel, the

largest supplier of ornamental grasses in the country. (Bluemel's Fallston, Md. facility has more than 500 species.) It took Europe a few years to accept them, but Bluemel says he has European garden magazines from the 1920s which show their use as common.

When Bluemel came to the U.S. from Switzerland in 1960, ornamentals were nearly unheard of. But he began growing and selling them, as did another Maryland nurseryman, Richard Simon of Bluemount Nurseries in Monkton.

Sales of ornamental grasses have skyrocketed the last five to seven years.

"Our grass sales are increasing at a strong rate over the last few years," Simon says; he estimates nearly 100 percent yearly increases.



Ornamental grasses look great around water. Here, giant reed grass (next to diving board) flanked by switch grass and cord grass (foreground) are used.





**Pampas grass and giant reed grass are used to shield a green from the cart path at Hillcrest Country Club.**

Most of Simon's sales have been to landscape contractors, "which means that they're being specified by landscape architects," he says.

Hurdzan specifies them at ever-increasing rates. "They're easy to use," he says. Just dig the appropriate size hole, add organic material for nutrition, water sufficiently for four to six weeks. The only other maintenance is cutting them down once a year in winter or early spring, depending on the variety, to six or eight inches above ground. Sometimes, every seven to 10 years, it is necessary to split them and move some of the plant if it is spreading too wide. They have also proven to be almost completely disease- and insect-free.

Hurdzan has used ornamental grasses about everywhere on the golf course: rough areas, non-play areas and even in play. Some seem to do better the worse the conditions get—bad soils, landfills, strip mines, under hotter and drier conditions.

John Moorman, superintendent at the nine-hole Hillcrest Country Club in Batesville, Ind., was one of the first people to experiment with Hurdzan's suggestions for ornamental grasses, beginning in 1981.

"We had no idea what we were getting into," Moorman says. "We were kind of hesitant. We were surprised the greens committee even let us do it, not knowing what we were getting into."

What they got into was something

that became quite successful—so successful that the new course logo is an ornamental grass.

Maiden grass, giant reed grass, fountain grass and zebra grass are common on the course, used as accent plants or screens and even as a hazard on one short par four.

Hillcrest is in the process of building the second nine, and Hurdzan is frequently incorporating ornamental grasses in the holes' design.

Ornamental grasses are not very exciting-looking when they are planted, which is best done in the spring in colder climes. They are

nothing more than a few short, dead-looking stalks sticking out of the ground, and some early criticism might have to be endured. But once they start shooting, look out.

"By the fall, the same members who were complaining in the spring wanted to know where to buy them for their lawns," Moorman smiles.

Moorman got his grasses from Rich Simon. "They have a lot of attributes," Simon notes. "To say why we should not use (ornamental) grasses, I can't give any reason." He emphasizes that understanding the grasses and their characteristics is paramount to



**John Moorman uses Maiden grass extensively at Hillcrest Country Club. The plant often grows to six feet.**



using them properly. (He and other nurseries can help potential users with this.)

Greg Kane of Lake County Nursery in Perry, Ohio, says, "People selling them have to be familiar with the grasses or they can't sell them. As we became more familiar with them, we started picking up more each year."

In general, most of the higher-growing varieties require full sun-

light, with the lower ones sometimes tolerating partial shade.

Ornamental grasses are used more in the South, but they are spreading rapidly northward. "Creative designers are looking at what's done with them in the South and doing it in the North," says Bill Hendricks of Klyn Nursery, also in Perry, Ohio.

Hendricks was the first to bring ornamental grasses to northeast Ohio, in

the '60s, when he was running Lake County Nursery. He found them easy to grow in the nursery and also in the landscape.

### Blossoms

Ornamental grasses, Hendricks says, are very cost-efficient because of their low maintenance and resiliency. Proper site planting reduces mowing expenses and labor requirements, fer-

## ORNAMENTAL GRASSES

The following is a short list of some common species of ornamental grasses and their characteristics. For a complete list in your area, contact a local nursery which grows them. (Zones refer to USDA map below.)

**Giant reed grass** (*Arundo donax*) grows to 14 feet; blooms mid-September to early winter; for accent or specimen plant; zones 5-6.

**Plume grass** (*Erianthus ravennae*) grows to 14 feet; blooms mid-August through late fall; accent or specimen plant; zone 5.

**Maiden grass** (*Miscanthus sinensis Gracillima*) grows to three to six feet; blooms early September through early winter; fine texture, reddish pink flowers; zone 5.

**Striped eulalia grass** (*S. variegata*) grows to three to six feet; blooms mid-September to early winter; use as specimen, in groups or as screen; zone 5.

**Zebra grass** (*S. zebrina*) grows to three to six feet; blooms mid-September to early winter; unique green foliage with horizontal yellow bands; zone 5.

**Switch grass** (*Panicum virgatum*) grows to four to seven feet; blooms August through early winter; narrow leaf and stem, open flower head; zone 5.

**Fountain grass** (*Pennisetum alopecuroides*) grows to four feet; blooms late August to early fall; mounded form with feathery plume; zone 5.

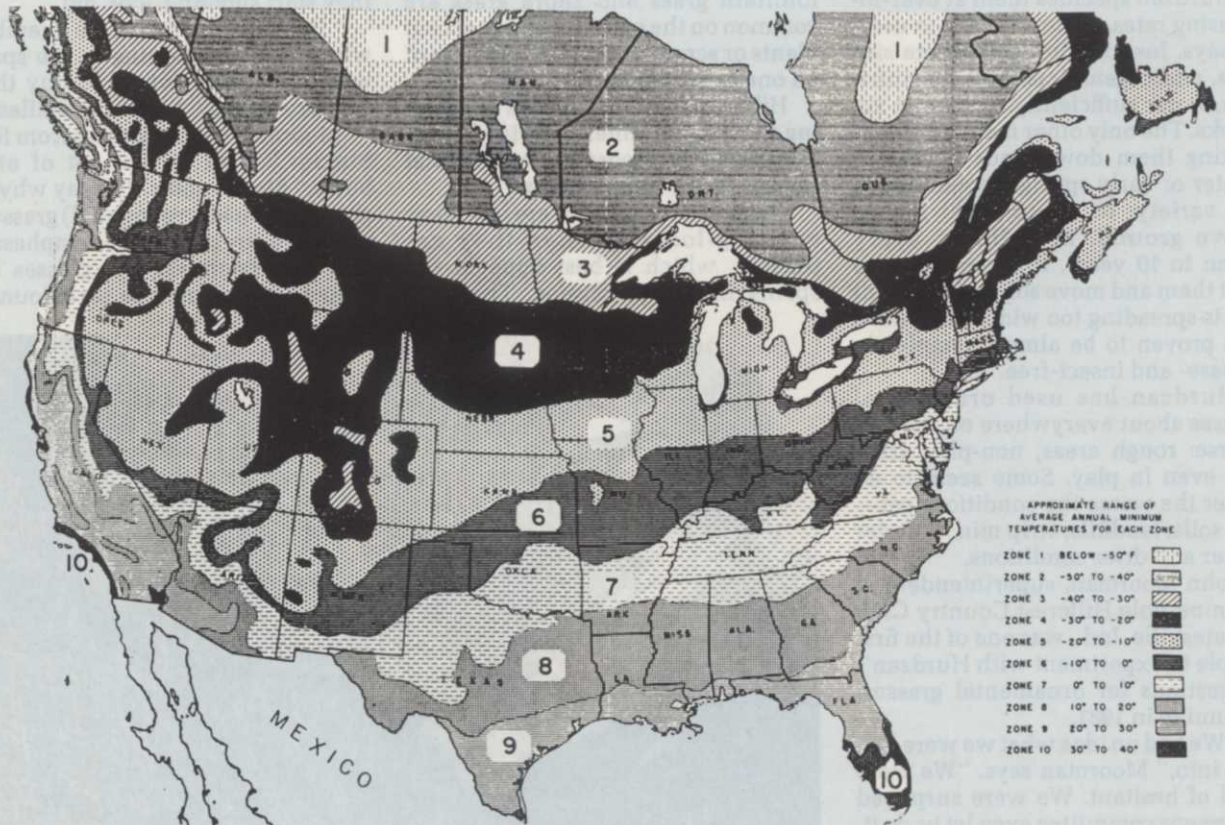
**Dwarf fountain grass** (*A. hameln*) dwarf version growing to one to two feet; also mounded form; zone 5.

**Ribbon grass** (*Phalaris arundinacea Picta*) grows to two feet; multi-stripped green and white blades; zone 4.

**Cord grass** (*Spartina michauxiana Aureo-marginata*) grows to four feet; blooms September to early winter; shiny green foliage with yellow marginal stripes.

**April green fescue** (*Festuca amethystina*) grows to 10 inches; blooms in June with purple flower spikes; use as accent, border or mass plantings; zone 4.

**Ruby grass** (*Rhynchelytrum roseum*) grows to two to four feet; blooms late July to early October; flowers ruby red fading to pink or white; zones 5-9.



Map. The zones of plant hardiness (from *Plant Hardiness Zone Map*, Agricultural Research Service, U. S. D. A., Mis. Pub. No. 814, Gov. Print. Off., Wash. D.C.)





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tilizer and chemical costs as well.

They are also attractive. Varieties show some kind of visual interest, in some cases, for nine months out of the year because of their extended blooming period. The *Miscanthus* genus displays such lengthy bloom characteristics (see box).

One of Hendricks' more recent customers, Joseph Baidy of Acacia Country Club in Lyndhurst, Ohio, began planting the grasses about two years ago.

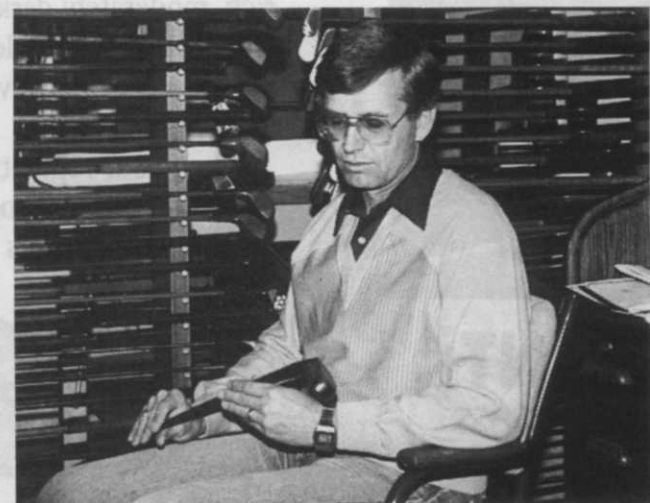
"Using the proper setting will complement any planting on the course," he says. "You can replace trees with them and have less damage from the roots because they are fibrous."

There is a caution, though. They are grasses, he emphasizes, "and you can wipe them out if you're not careful with chemical applications."

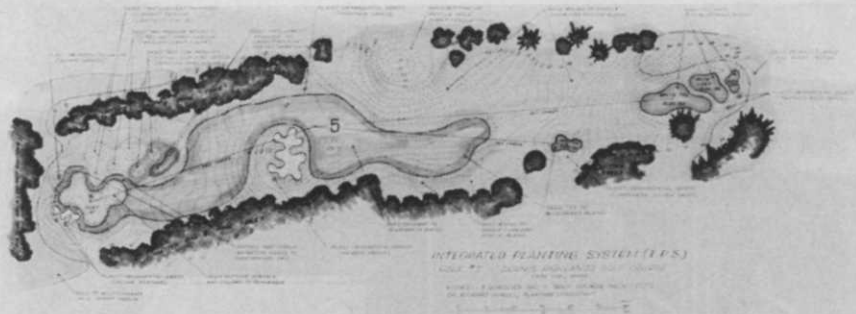
Baidy echoes Moorman's feelings: "It's remarkable the impact they've



**Superintendent John Moorman** began planting ornamental grasses on a limited basis in 1981. Now, every hole at Hillcrest Country Club has grasses on them.



Though a golf memorabilia collector and student of the game's past, **Michael Hurdzan, Ph.D.**, is an innovator when it comes to incorporating ornamental grasses into golf course design.



**Michael Hurdzan's design specifies where plume grass, maiden grass, fountain grass and various feather grasses will be planted on the par-four fifth hole at Dennis Highlands Golf Course on Cape Cod.**

had. The reduction in maintenance is great."

### Propagation

The grasses are ideal for hillsides where mowers can't go and areas too dangerous for workers.

Their only drawback? There exists a wide-spread lack of education about their longer-term growth habits. Blue-mel says he has grasses that he planted in his home landscape nearly 30 years ago and they're doing fine.

But first-time buyers rarely are willing to dive in and use ornamental grasses, or anything else "new" for that matter, extensively. More commonly, as in Moorman's case, they start with a few varieties and experiment. And then they expand their use.

Use of ornamental grasses in parks and zoos is widespread. Simon believes golf courses have tremendous potential as well, and would like to see more of them on the links. "The space in use now is a drop in the bucket compared to the space available," he notes. Referring to Hillcrest's second nine, he adds, "you can plant a lot of grasses on a nine-hole golf course." **LM**



**Richard Hurley, Ph.D.**, is one of the few people who has done research on ornamental grasses.



For **Joseph Baidy of Acacia Country Club**, ornamental grasses have been anything but dogs. Hannibal agrees.