

Fairway Grasses for Midwest Golf Courses

Diseases and Tough Climate Conditions Make Choices Tricky

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Kentucky bluegrass can produce quality fairways in the Midwest if it is not mowed too short.

Keep track of research.

Climates vary widely across the Midwest, complicating the choice of fairway turfgrass species.

New epidemics of gray leaf spot have weakened the popularity of perennial ryegrass, long a preferred fairway species in many parts of the Midwest.

Cultivars are available that accentuate the strengths of various fairway species.

In the cool, moist regions of Scotland where golf began, selecting a fairway turf species is not difficult. Fine fescues, bentgrasses and other cool-season turfgrasses are native there and very well adapted to the climate. They generally perform well at low mowing heights with minimal maintenance.

In the cold winters and hot summers of the Midwestern United States, however, grasses that are truly adapted to fairway conditions are rarer, and no single species stands out as the region's ideal fairway turfgrass.

Before the 1980s, Kentucky bluegrass (*Poa pratensis*) was the most-used species in Midwestern fairways. During the past two decades, many courses switched to perennial ryegrass (*Lolium perenne*) and creeping bentgrass (*Agrostis palustris*).

There is no clear choice for every Midwestern situation, however. The best choice depends on course budget, climate, water availability and other regional factors.

Kentucky Bluegrass

Kentucky bluegrass is one of the best-adapted, general-use turfgrass species used in the Midwest. It has excellent color and texture and forms a very dense turf. High-quality, affordable seed is readily available for many cultivars.

Long a preferred fairway species in much of the Midwest, perennial ryegrass performed poorly in 1998 after gray leaf spot disease struck many golf courses. Notice the healthy, disease-free Kentucky bluegrass sod around the sprinkler head.

Kentucky bluegrass's extensive complex of underground stems (rhizomes) gives it an outstanding recuperative capacity after divoting and other damage. Highly cold-tolerant, Kentucky bluegrass can be found throughout Canada and into Alaska. As a fairway grass, it is relatively inexpensive to maintain and is still the grass of choice on lower-maintenance Midwestern golf courses.

Kentucky bluegrass's relatively poor shade tolerance

can limit its use. Its biggest disadvantage on modern fairways, however, is its intolerance of low mowing heights. When mowed below 1½ inches, most cultivars lose density, and annual bluegrass (*Poa annua*) slowly becomes the dominant turf. The mowing height for modern fairways is well below this minimum height for Kentucky bluegrass, so old bluegrass fairways are often converted to more mowing-tolerant species.

Some factors that have pushed Kentucky bluegrass off fairways include the patch diseases -- such as summer patch (*Magnaporthe poae*) -- which produce a typical "frog-eye" pattern in turf. Other species are less susceptible to these diseases.

From north to south, and from east to west, climates vary dramatically across the Midwest.

Another problem is seeded Kentucky bluegrass' slow establishment rate. Spring-seeded Kentucky bluegrass establishes very slowly, and its seedlings perform poorly in summer. It is often not fully mature until August or later.

Cultivars developed in the late 1990s may bring a resurgence of Kentucky bluegrass use on fairways. Absolute, Award, Nuglade, Rambo, Rugby II, Total Eclipse, Unique and others are marketed for use on fairways mowed as low as ½ inch.

These new cultivars have looked promising in cooler regions, but they have yet to stand the test of time in the Midwest. Blends were established on many courses in the region in 1998 and 1999, and they'll be monitored over the next few years. At Iowa State University, we established a high-maintenance Kentucky bluegrass fairway trial at ½ inch in September 1998, followed by a nonirrigated trial at ½ inch in September 1999. These studies will require three to five years to complete.

Perennial Ryegrass

In years past, perennial ryegrass could hardly be considered a turfgrass, and certainly not a desirable fairway grass. Breeding and selection, however, have led to the development of more than 100 excellent turf-type perennial ryegrass cultivars.

These cultivars have excellent color, texture and density. Their growth rate and appearance are so similar to Kentucky bluegrass that the two are quite compatible in mixtures. Common types of perennial ryegrass are still available, but they are not suited to fairway use and should be avoided.

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Perennial ryegrass is known for good wear tolerance, an important characteristic in fairways. The biggest advantages of perennial ryegrass, however, are its rapid germination and establishment rates. When damaged, perennial ryegrass can be re-established in a few weeks, whereas Kentucky bluegrass and creeping bentgrass may take months to bring back into play. Perennial ryegrass also has excellent tolerance of low mowing and is much more tolerant of fairway conditions than most Kentucky bluegrasses. It is also far less susceptible to the patch diseases.

Perhaps perennial ryegrass's biggest advantage is its tolerance of the herbicide ethofumesate (Prograss), which provides excellent postemergence control of many *Poa annua* biotypes. Kentucky bluegrass and creeping bentgrass are more sensitive to the herbicide, complicating *P. annua* control in these species. Perennial ryegrass is not damaged by ethofumesate at recommended rates, and it can be seeded into treated areas immediately after application. Ethofumesate on perennial ryegrass fairways provides the most successful control of *P. annua* of any method, short of soil sterilization with methyl bromide.

It doesn't look hardy in winter (or fall or early spring, for that matter), but zoysiagrass can survive cold temperatures.

Perennial ryegrass has shortcomings. The bunch grass has no rhizomes and no stolons, so recovery from divots is very slow. Extensive overseeding is a standard part of its maintenance. Its growth rate is similar to Kentucky bluegrass's through most of the season, but superintendents report that it grows rapidly in the spring and early summer. This can be controlled with a growth regulator such as Primo (*trinexapac-ethyl*), but this adds to maintenance costs.

Although patch diseases are generally not a problem, perennial ryegrass is much more susceptible to *Pythium* blight and red thread (*Laetisaria fuciformis*) than is Kentucky bluegrass. *Pythium* can be particularly devastating on ryegrass fairways in high-temperature conditions, and the cost of fungicides can make perennial ryegrass an expensive alternative to Kentucky bluegrass in warmer parts of the Midwest.

Another serious disease is gray leaf spot (*Pyricularia grisea*). This disease does not appear to be a problem on Kentucky bluegrass or creeping bentgrass, but in ryegrass, it can be worse than *Pythium*. In the Midwest, gray leaf spot has generally been limited to the southern, warmer sections, but in 1998, it destroyed many ryegrass fairways in Nebraska, Iowa and northern Illinois. This greatly increased expenditures for fungicides, and many superintendents in the region began considering alternatives.

Bentgrass is supposed to weather the cool season with little damage, but winter dessication by drying winds can dramatically injure fairways if irrigation is withheld during a winter drought.

Fortunately, the problem did not repeat itself in 1999. Only time will tell, however, whether gray leaf spot will be

a recurring problem in the central Midwest.

Winterkill limits perennial ryegrass use in the northern Midwest. For example, ryegrasses winter well in southern and central Iowa, but ryegrass fairways are often severely damaged in the northern counties' winters. In Minnesota and Wisconsin, perennial rye gets little use.

Although many superintendents regard perennial ryegrass as an excellent choice, winterkill and increased spending on fungicides may make other grasses more appealing.

Creeping Bentgrass

Traditionally, creeping bentgrass grew on very few Midwestern fairways because such large expanses of bentgrass were thought to be too expensive to maintain. By the early 1980s, however, player expectations had led to increasing maintenance costs on existing Kentucky bluegrass/*Poa annua* fairways, so bentgrass became a viable option. Today it is the primary fairway species on higher-budget courses in the region.

Bermudagrass can't handle cold winter temperatures very well.

Among cool-season grasses, creeping bentgrass is one of the best-adapted species, producing excellent fairways at a ½-inch height of cut. It is stoloniferous, and its recuperative capacity is excellent. Its texture and density are outstand

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ing, and its color provides a beautiful contrast where darker-colored bluegrass grows in the rough.

Creeping bentgrass also provides an excellent playing surface, and one of its biggest selling points has been player acceptance. Many public courses that converted in the '90s advertise their bentgrass fairways to lure golfers who will pay a premium to golf on what was once the grass of private country clubs.

Creeping bentgrass has some disadvantages. Maintenance costs can be high because of its susceptibility to Pythium blight and brown patch (*Rhizoctonia soloni*). Clippings are usually picked up, which adds to labor costs, and extensive aerification is usually a part of standard maintenance. Thinning is common in cleanup rounds and in other heavily trafficked areas. Its cold tolerance is good, but it's very susceptible to desiccation in the dry, windy winters of the western Midwest. Its establishment rate is slow, particularly in spring, and fairways lost to desiccation may require months to grow back in, compared with weeks for perennial ryegrass.

Although its stoloniferous growth habit renders an advantage in recuperation from damage, a well-knit turf may surrender very large divots that require topdressing and seeding for rapid recovery. These divots give *Poa annua* a competitive advantage.

Poa annua is very competitive with creeping bentgrass at fairway mowing heights and may easily become the dominant species on older fairways in some regions. Ethofumesate can provide some control, but it can also damage bentgrass. Lightweight mowing, clipping removal, cultivation and other cultural practices to encourage bent and discourage *P. annua* can provide some success, but *P. annua* remains a fact of life on creeping bentgrass fairways.

Fine Fescues

The term "fine fescue" refers to a group of very fine-textured grasses in the genus *Festuca*. They include creeping red fescue (*Festuca rubra*), chewings fescue (*F. rubra commutata*), hard fescue (*F. longifolia*) and sheep fescue (*F. ovina*).

In the cooler, wetter regions of the world, such as the British Isles, fine fescues form a dense, uniform turf under low mowing heights and are often found in the species mix on golf course fairways. In the Midwest, their sensitivity to heat and drought, particularly at low mowing heights, allows little use for them on golf courses. All are bunch grasses, with the exception of the rhizomatous creeping red fescue. Yet creeping red fescue cannot match the recuperative performance of Kentucky bluegrass and creeping bentgrass.

A few cool locales in Michigan and Wisconsin boast fine fescue fairways, but in most of the Midwest, other species are a better choice. Their real Midwest niche is in unmowed roughs. This is particularly true in shade, although they are also adapted to full sun in much of the region. They provide

an attractive, low-maintenance alternative to Kentucky bluegrass roughs and are increasing in use each year.

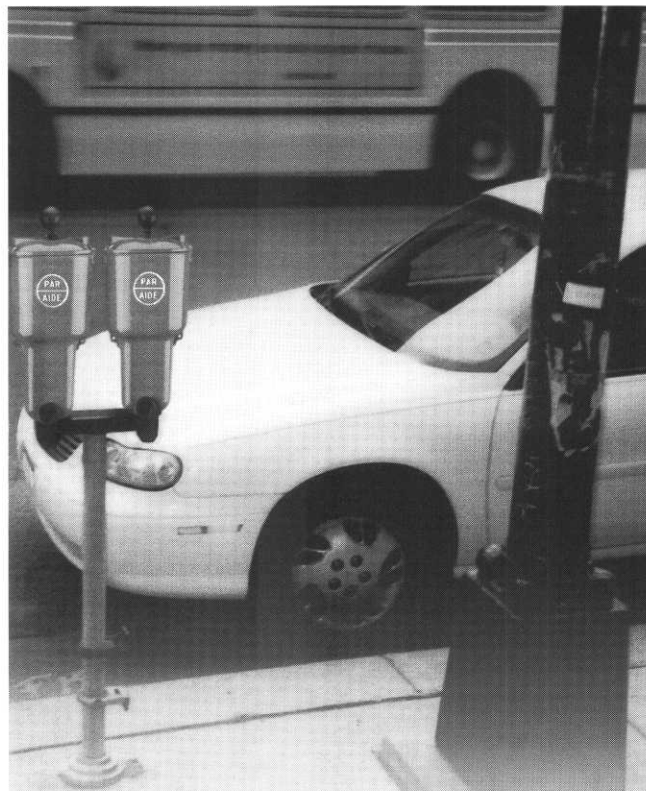
Annual Bluegrass

Annual bluegrass is such a successful weed that it is often maintained as the dominant species on golf course fairways. In many climates, it can provide reasonably good playing conditions. In much of the Midwest, it is a major problem, and if superintendents could kill it, they would. Midwestern superintendents often refer to their fairways as being a mix of *Poa annua* and another species, such as "bent/Poa" or "Kentucky bluegrass/annual bluegrass." Perennial ryegrass and annual bluegrass fairways are less common because of the effectiveness of ethofumesate against *P. annua* in that situation.

Poa annua presents many problems. It can easily be lost to winterkill, and it's susceptible to a variety of fungal diseases. In the spring it produces many seed heads that disrupt turf uniformity. *Poa annua*'s biggest drawback, however, is its life cycle. A winter annual, it germinates in late summer or fall, lives through winter as a mature grass, produces seeds in the spring and then simply dies in the heat stress of summer, as would be expected of a winter annual.

Some biotypes of annual bluegrass may also live through the summer as a weak perennial, but even these are easily lost in heat-stress periods.

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The latest trend in *Poa annua* research is the development of new, improved types that are more tolerant of stress and provide a better playing surface than wild types. Although this research has been aimed primarily at developing cultivars for greens, it may also result in new grasses for fairways, at least in climates where *P. annua* is particularly well adapted.

Wheatgrasses

In dry parts of the Midwest, in places too cool for warm-season grasses, Fairway crested wheatgrass (*Agropyron cristatum*) and western wheatgrass (*Pascopyrum smithii*) are suitable on fairways, if irrigation is unavailable. Irrigated Kentucky bluegrass is still a better choice in this region, but these grasses provide a possible nonirrigated alternative.

Fairway crested wheatgrass is a bunch grass, whereas western wheatgrass has short rhizomes. Both species are relatively coarse-textured and develop a turf with a lower density than Kentucky bluegrass and perennial ryegrass. Although wheatgrasses were common on low-maintenance fairways in the '60s and '70s, their use has decreased in recent years, and most new courses in drier regions now use fairway irrigation. The species still provide low-cost alternatives where water is limited.

Weeping Alkaligrass

Weeping alkaligrass (*Puccinellia distans*) is a gray-green, tufted bunch grass that can provide reasonably good-quality fairway turf. This cool-season grass has relatively good heat and cold tolerance. Its use is limited to situations where sodium levels are so high that other grasses will not survive. Sodium can come from sewage effluent water, deep wells or natural soil concentrations, particularly in the West.

Weeping alkaligrass is much more tolerant of sodium than Kentucky bluegrass and creeping bentgrass and can be a substitute where necessary. Sodium is rarely found uniformly over an entire golf course and is often found in low pockets where it can kill less-tolerant grasses. Weeping alkaligrass is often successful in these areas. It is a bunch grass, and overseeding is important to maintain a uniform, dense turf.

Warm-season Grasses

Although the Midwest is generally a cool-season region, some warm-season species are used on fairways in the southern and western sections. In southern Illinois, Missouri and Kansas, bermudagrasses (*Cynodon* species and hybrids) can be used, although their sensitivity to cold temperatures may result in significant turf loss some years.

Zoysiagrass (*Zoysia japonica*) is better adapted because of its greater cold tolerance. Properly managed zoysia-

grass can produce outstanding fairways that are the envy of golfers from the central and northern region of the Midwest, who, after visiting Kansas or Missouri, often ask their local superintendents why they cannot have zoysia-grass on their tees and fairways.

Even though zoysia can tolerate very cold winters and will survive as far north as the Canadian border, it goes dormant as soon as temperatures cool in the fall and does not green up until well into the spring. This greatly limits its appeal outside the southern Midwest.

Buffalograss (*Buchlœ dactyloides*) is for drier parts of the Midwest. It does not provide the turf quality of zoysia-grass or bermudagrass, so these species are preferred where sufficient moisture is available. The advantage of buffalograss is its tolerance of hot, dry conditions. It is sometimes used on nonirrigated fairways in western Kansas and Nebraska.

Although the blades of buffalograss are relatively fine-textured, its thick stolons and swollen nodes give it a coarse-rough texture. It also lacks the density of bermudagrass and zoysiagrass at lower mowing heights. Recent breeding and selection have produced several improved cultivars, and in the future it may be more widely used on courses in the drier regions of the Midwest.

The Future

The past two decades have brought many new grasses and cultivars, and this trend is likely to continue. The choices available to the superintendent should increase. The rapidly expanding field of biotechnology, which is already yielding developments such as grasses that are tolerant of nonselective herbicides, should bring many advances in the next few years.

It will be an exciting time to be involved in turfgrass management. These rapid changes will also mean that continuing education will play an even greater role in the superintendent's career.

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