



The plant breeder has improved tall fescues for turfgrass use. The new Rebel (left) compared with the old Kentucky-31 (right).

Turf-Type Tall Fescues Are Here!

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THAT A COOL season grass for non-irrigated, low maintenance areas is not easy to find should not surprise anyone. Such areas are synonymous with poor, droughty soils, low fertility rates, and general neglect. Add high summer temperature and disease stress, sometimes heavy traffic, and shade problems, and not many turfgrass species are available for the job. Not until the new turf-type tall fescues came onto the scene recently.

In earlier days, a mixture of Kentucky bluegrass and fine fescue (creeping red, chewings, hard, or sheep) was the popular and the accepted choice. Unfortunately, these grasses become dormant during the summer, and the turf turns brown even at a cut above two inches. Fortun-

ately, however, these grasses rejuvenate quickly with the return of moist and cool nights in the fall.

In the mid to late 1970s, formulations of commercial seed mixes began to change. Fine fescues were replaced with improved perennial ryegrasses, the ryes established themselves easily and were quite compatible with Kentucky bluegrass, and these mixes continue to be popular.

Today, however, so many more choices are available in seed mixes for non-irrigated turf areas that one must constantly be reminded that no one grass, mixture, or blend is going to be a panacea. Nevertheless, the new turf-type tall fescues seem to have a way of persisting and retaining their color better during long, hot, dry

summers than any other type of cool-season grasses we know.

Tall fescue was first described in 1771 by Schreber, a German botanist, then introduced from Europe to the United States prior to 1850 by early settlers. Since 1940, it has been used widely for lawns, roadsides, pastures, airfields, athletic fields, waterways, utility rights-of-way, and for soil conservation purposes. This broad use has been due in part to its adaptability to a wide range of soil types and climatic conditions. However, the extensive and rapid acceptance of tall fescue since 1950 has been caused by its valuable qualities as a pasture grass.

The most widely used variety of tall fescue to date has been Kentucky-31.

The parental plants of Kentucky-31 were found growing on a hillside of the William M. Suttter farm, in Menifee County, Kentucky, and brought to the attention of E. N. Fergus, an agronomist, in 1931. They were released as a variety in 1943 by the University of Kentucky. Kentucky-31 is valuable for pasture and erosion control because of its deep root system and sod-forming qualities. Its ability to survive and remain green under drought and cold weather conditions makes it unique among cool season grasses.

Until recently, tall fescue was not widely considered a desirable species for turf except in a few areas. It has generally

been considered a weed in fine-leaf lines. Prior to 1979, only Kentucky-31 and Alta, among the pasture-type tall fescues, were even considered for turf situations. They adapted well to heat and drought, diseases, insects, poor drainage, and shade, and they made an acceptable lawn where Kentucky bluegrass and the fine-leaf fescues grew poorly. Unfortunately, they also had the undesirable traits of being very coarse, with a wide leaf blade and a marked tendency to become clumpy and to bunch up after several years.

THE ERA of the turf-type tall fescues was initiated with the release of Rebel, in 1979. Rebel is a landmark vari-

ety because it displays all the advantages of Kentucky-31 tall fescue while producing a turf much finer (up to 33%) and denser (up to 188% more tillers) than Kentucky-31. For the first time, a tall fescue could produce a turf that was heat and drought-tolerant, attractive, and persistent without the coarse leaf and clump-type growth habit characteristic of pasture-type varieties.

Dr. C. R. Funk, turfgrass breeder at Rutgers University, in New Jersey, is responsible for the development of the turf-type tall fescues. Dr. Funk's tall fescue breeding program started in the early 1960s with a collection of plants selected from old turf areas in New Jersey and

TABLE 1
KY-31 Tall Fescue Characteristics

Advantages	Disadvantages
1. Greater heat and drought tolerance compared to Kentucky bluegrass, perennial ryegrass, hard, chewings, creeping red fescues and bentgrass.	1. Will not tolerate a close height of cut. Recommended cutting height of 3 to 4 inches.
2. Produces an extensive, deep root system	2. Produces a bunch type growth habit.
3. Provides a traffic-tolerant turf that is tough, durable, and persistent.	3. Does not blend well with other grasses as a result of its bunching growth habit.
4. Adaptable to a wide range of soil types, pH, moisture, and growing conditions.	4. Coarse blades, light leaf color, and clumping reduces attractiveness.
5. Adapted for use in full sun to moderate shade.	5. Minimal ability to spread with occasional rhizome activity. Poor recuperative capacity.
6. Produces no thatch.	
7. Tall fescue is moderately tolerant to salinity, alkalinity, and waterlogged conditions.	

TABLE 3
Selecting Tall Fescue Varieties for Turf Use

Turf-Types with Improved Performance*	Low Maintenance Varieties with Moderate Turf Quality**	Pasture Types with Poor Turf Quality and Persistence***
Rebel	Clemfine	KY-31
Rebel II	Galway	Alta
Bonanza		Kenhy
Jaguar		Goar
Mustang		Fawn
Apache		Johnstone
Arid		Triumph
Falcon		
Olympic		
Adventure		
Houndog		
Finelawn		
Mojave		
Brookston		

* Improved Turf-Type Varieties have a finer leaf texture with increased turf density. These varieties will produce a darker green color, are more attractive and can withstand a closer height of cut compared to KY-31 types. These varieties have generally shown improved shade performance.

** Provides better turf performance compared to KY-31 types. Good choice for low maintenance lawns, parks and cemeteries.

*** Not desirable for high quality turfs.

Dr. Richard Hurley, 1985

TABLE 2-A
Tall Fescue Adaptation

For golf course use, tall fescue is best adapted in Zones 2, 3, 7 and 8 and the lower half of Zones 1, 5 and 6.

Zones of Grass Adaptation in the United States



Key to Climate Zones:

- 1. Cool — Humid
- 2. Transition
- 3. Warm — Humid
- 4. Tropical
- 5. Cool — Semi-Arid Plains
- 6. Cool — Semi-Arid Inter-Mountain
- 7. Cool — Humid
- 8. Warm — Arid

TABLE 2-B
Tall Fescue Adaptation

For golf course use, tall fescue is best adapted in Zones 2, 3, 7 and 8 and the lower half of Zones 1, 5 and 6.

Zones of Grass Adaptation in the United States



Key to Climate Zones:

- 1. Cool — Humid
- 2. Cool — Warm Season Transition
- 3. Warm — Humid
- 4. Tropical
- 5. Cool — Semi-Arid Plains
- 6. Semi-Arid Inter-Mountain
- 7. Cool — Humid
- 8. Warm — Arid

surrounding eastern states. These plants were the source for most of the germplasm constituting Rebel. Additionally, some parental germplasm was obtained from a number of accessions received from the Plant Germplasm Resource Laboratory of the U.S.D.A. and from tri-species hybrids of tall fescue, meadow fescue, and perennial ryegrass obtained from the U.S. Regional Pasture Research Laboratory, University Park, Pennsylvania. Clones of the original germplasm were initially evaluated in turfs subjected to frequent close mowing (3/4 of an inch). The ultimate goal was to develop all fescue varieties displaying finer leaf texture, denser turf, darker green color, and improved resistance to insects and disease with good heat and drought tolerance.

Superintendents in the South probably were the first golf course superintendents to appreciate the new turf-type tall fescues. They tried seeding them into moderate shady areas where bermudagrass and other warm season grasses would not persist. Happily, it worked, and southern golfers now had grass lies in partially shaded areas. Obviously, most turfgrasses perform poorly in full shade or in areas with excessive tree root competition, but the cooling effect of the shade canopy seems to help tall fescue persist through the summer in southern areas.

Recent university research indicates that mixing a shade-tolerant Kentucky bluegrass such as Glade or Ram I with a turf-type tall fescue will improve overall performance in shaded areas. The addition of Kentucky bluegrass seems to give an even finer-leaf texture to the turf. A shade-tolerant Kentucky bluegrass may be used in a mixture with tall fescue, but it should be limited to no more than 10 percent by weight of the mixture.

Turf-type tall fescues are more shade tolerant than Kentucky-31 fescue. They also take on an even finer-leaf texture in shade. This difference in shade tolerance between Kentucky-31 and the turf-type tall fescues shows up better at moderate to high maintenance levels, however.

Heat and drought tolerance are the major advantages the turf-type tall fescues have over any other cool season grasses. Obviously, these are important characteristics for rough grasses on a golf course. Tall fescue will retain green color longer into a drought and become green faster with the return of moisture than Kentucky bluegrass or perennial ryegrass. The narrow blade and more erect growth of the new tall fescues will provide a good rough, although still not equal to Ken-



Tall fescue makes an ideal bunker edge.

tucky bluegrass maintained in an adaptable climate. Tall fescue, with its short rhizomes, recovers poorly from divots. For this reason, Kentucky bluegrass is still desirable in favorable climates, especially in the secondary roughs adjacent to the fairways. However, the turf-type tall fescues are always a good choice for the primary rough, and secondary rough, too, where Kentucky bluegrass or warm season grasses are poorly adapted because of no irrigation or the lack of shade tolerance.

OTHER USES OF the turf-type tall fescues are around bunkers, on grass mounds, or in depressions. Their deep penetrating root system is ideally suited to the adverse sandy conditions around bunkers. Extensive root development

also helps prevent the bunker edges from collapsing. With mounds regaining popularity as a desirable design feature, the new fescues will stay greener longer for the same reason. The driving range landing area is another good site for their use. The Congressional Country Club, in Bethesda, Maryland, seeded its reconstructed driving range to Rebel tall fescue in 1981, and it has performed very well.

There are many other possible uses of the turf-type tall fescues on the golf course, including tee banks, pond and stream banks, non-mowed or natural areas, and the clubhouse lawn. Natural, or non-mowed areas are a feature on more courses today. If not mowed, the turf-type tall fescues will grow to approximately 18 to 24 inches tall. Obviously this practice is only advisable outside the

primary rough areas. Tall fescue will persist and stay green without irrigation under this kind of management.

There are golf course sites where tall fescues are not well adapted and are not recommended for use. Fairways and tees both require a close height of cut (1/2-inch to 3/4-inch). *Poa annua* invasion is almost a certainty. Since tall fescue still has a bunch-type growth pattern, it will recover slowly from divot scars. Furthermore, compared to perennial ryegrass, tall fescue germinates and establishes itself more slowly. It is intolerant of a close cut and it has less plant density. For these reasons, turf-type tall fescues are best adapted for areas other than tees and fairways. Some universities, however, successfully maintain these grasses on test plots at 3/4-inch cut with irrigation and fertilization. Plant breeders predict new varieties will someday be suited for the more intensely played areas on the golf course.

New stands of the tall fescue can be seriously damaged by allowing traffic on newly seeded areas prematurely. It does not germinate as quickly as perennial ryegrass, although it is seven to 10 days faster than Kentucky bluegrass.

Because it also matures more slowly than perennial ryegrass, a new planting

should not receive traffic the first winter, especially if the ground is wet.

Presently, there is limited advantage in blending the turf-type tall fescues. Most of the new varieties have the same desirable characteristics — that is, relatively fine-leaved, excellent heat and drought tolerance, and the same weaknesses, such as susceptibility to brown patch and *Pythium*. This factor minimizes the importance of blending, unlike other grasses, especially bluegrasses. As a precaution, avoid blending any of the pasture-type tall fescue varieties, such as Kentucky-31 with the turf-type tall fescues.

There is a growing common practice to mix the new tall fescue seed with 10 percent Kentucky bluegrass. This is most important to sod producers, since the rhizomes of Kentucky bluegrass add strength to the sod and improve recuperative potential. One important factor is to select a Kentucky bluegrass variety that is only moderately aggressive. The varieties A-34, Sydsport, Touchdown, Midnight, and Mystic are examples of Kentucky bluegrass varieties that will out-compete tall fescues and create a bluegrass mono-culture three to four years after seeding. The Kentucky bluegrass varieties that are not overly aggressive

and are desirable for use in tall fescue mixtures include Baron, Merit, Victa, Ram I, Nassau, Glade, and the common types Kenblue, Newport, Argyle, Delta, and South Dakota certified.

TURF-TYPE tall fescues may be seeded at lower rates than those recommended for Kentucky-31. For golf course use, a seeding rate of five to six pounds per 1,000 square feet is adequate. For a more rapid establishment, higher seeding rates may be used with fall seedings. This will produce a turf with good density and fine-leaf texture. For very low maintenance areas, seeding rates of three to five pounds per 1,000 square feet will give good results.

Fortunately, it appears the new turf-type tall fescues minimize the need for annual reseeding, unless unexpected loss occurs. The turf-type tall fescues improve with age, because of more tillers and leaves. Overseeding is easily accomplished since tall fescue essentially produces little thatch.

In addition to establishment by seeding, turf-type tall fescue sod is becoming increasingly available. It can be just as attractive as bluegrass. Use of tall fescue sod provides the golf course superintendent an additional alternative for grassing

TABLE 4

Performance of Turfgrass Varieties Seeded under Two Different Levels of Artificial Shade at North Brunswick, New Jersey after Four Years.

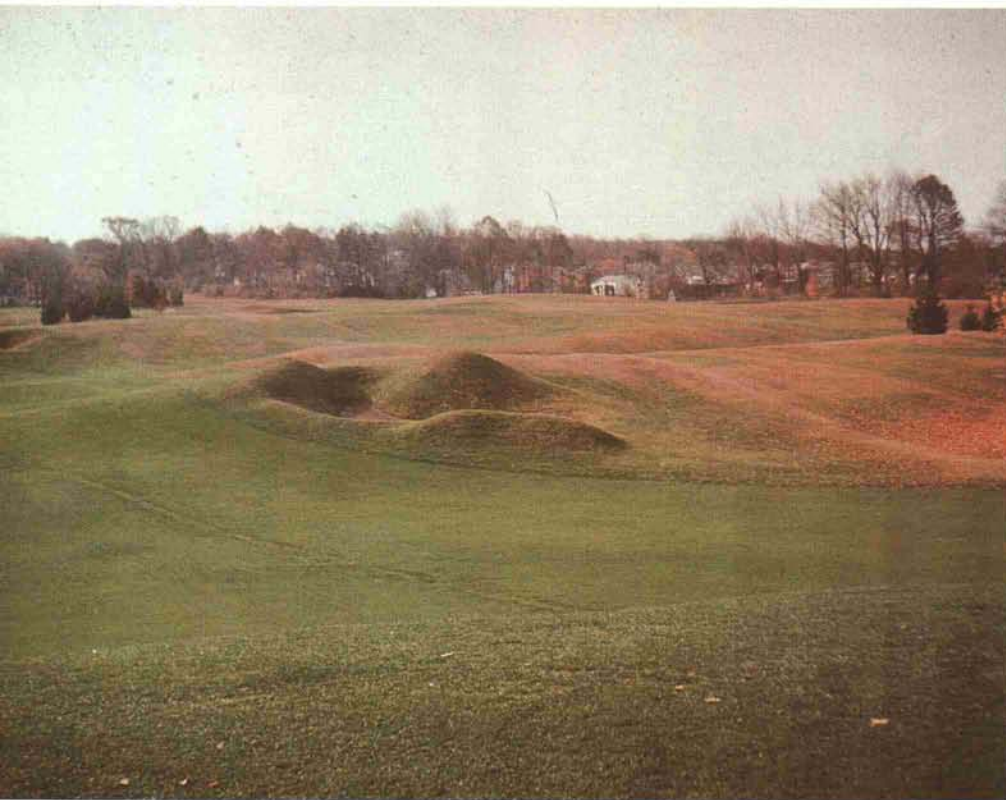
Variety	Turf Performance Score 9 = Best November 11, 1980		
	76% Shade*	92% Shade*	Avg.
Rebel Tall Fescue	5.9	5.2	5.6
A-34 Kentucky Bluegrass	6.0	4.9	5.5
Reliant Hard Fescue	5.1	4.0	4.6
Scaldis Hard Fescue	5.3	3.5	4.4
Jamestown Chewings Fescue	4.7	4.0	4.4
Biljart Hard Fescue	5.0	3.4	4.2
Banner Chewings Fescue	5.0	3.4	4.2
Kentucky-31 Tall Fescue	4.1	3.9	4.0
Pennfine Perennial Ryegrass	5.2	2.4	3.8
Fortress Strong Creeping Red Fescue	4.0	3.1	3.6
Nugget Kentucky Bluegrass	3.9	2.9	3.4
Highlight Chewings Fescue	4.7	1.8	3.3
Ruby Creeping Red Fescue	3.3	2.3	2.8
Park Kentucky Bluegrass	3.7	1.6	2.7
Glade Kentucky Bluegrass	3.1	1.7	2.4
Linn Perennial Ryegrass	2.4	1.3	1.9
LSD at 5%	1.0	1.2	0.8

*Light reduction ratings of shade cloth used.

TABLE 5

Use of "Turf-Type" Tall Fescue on Golf Courses

Location	Seed Mixture	Seeding		Zones of Adaptation
		Rates	Dates	
Roughs	a) 90% Tall Fescue 10% Kentucky Blue	150-200 #/acre	4/1 - 5/30 or 8/15 - 10/15	Lower Half of 1, 5 & 6
	b) 100% Tall Fescue	200-250 #/acre	8/15 - 10/15	
Shaded Sites	a) 90% Tall Fescue 10% Kentucky Blue	150-200 #/acre	8/15 - 10/15	Lower Half of 1, 5, & 6
	b) 100% Tall Fescue	200-250 #/acre	8/15 - 10/15	
Driving Range	a) 90% Tall Fescue 10% Kentucky Blue	150-200 #/acre	4/1 - 5/30 or 8/15 - 10/15	Lower Half of 1, 5 & 6
	b) 100% Tall Fescue	200-250 #/acre	8/15 - 10/15	
Clubhouse Lawns	a) 90% Tall Fescue 10% Kentucky Blue	150-200 #/acre*	4/1 - 5/30 or 8/15 - 10/15	Lower Half of 1, 5 & 6
	b) 100% Tall Fescue	200-250 #/acre*	8/15 - 10/15	
Tee, Green and Bunker Banks	100% Tall Fescue	200-250 #/acre	8/15 - 10/15	2
Pond and Stream Banks	90% Tall Fescue 10% Kentucky Blue	150-200 #/acre	4/1 - 5/30 or 8/15 - 10/15	Lower Half of 1, 5, 6 & 2
	100% Tall Fescue	150-200 #/acre	8/15 - 10/15	
Mounds	100% Tall Fescue	150-200 #/acre	8/15 - 10/15	2
No Mow Areas or Natural	100% Tall Fescue	120-200 #/acre	4/1 - 5/30 or 8/15 - 10/15	Lower Half of 1, 5, 6 & 2



Where mounds are in, tall fescue is up.

It even grows well in partial shade.



clubhouse or half-way house lawn sites and tee, green, and bunker banks or steep pond or stream embankments that are subject to erosion.

One major difference between the new tall fescues and Kentucky bluegrass/perennial ryegrass turf is the fertility requirement. Tall fescue requires only half the amount of nitrogen. Its requirement is similar to that of the fine-leaf fescues. Usually 1 1/2 to 2 pounds nitrogen per 1,000 square feet per six-month growing season is adequate to maintain the stand. If fertilizer is completely withheld, however, density and fine-leaf texture will be lost. On the other hand, tall fescue responds to higher fertilization levels with a darker green color and faster growth.

Another major advantage is the excellent resistance and tolerance of the tall fescues to insects, especially grubs. Sod webworms are not a problem either. Many perennial ryegrass varieties are badly affected by this insect pest.

The major disease problems are Brown Patch and *Pythium*. They also occur on Kentucky-31, but are rarely considered a serious problem on low maintenance lawns. Fortunately, the diseases are largely cosmetic in most areas and regrowth of new leaves eventually occurs from the crown. Leaf Spot (Net blotch) is another disease. The new tall fescues generally have improved resistance compared to the pasture-types. The leaf infection causes the turf to look off-color with a tan appearance due to the characteristic color of the Leaf Spot lesions on individual leaves. Further improvement looks promising with the release of new varieties displaying improved Leaf Spot resistance.

Over the past 30 years we have witnessed many trends and improvements in cool season turfgrasses. In the 1950s, Merion Kentucky bluegrass became popular. In the 60s and 70s many improved Kentucky bluegrasses became commercially available. The 1970s was the decade for the improvement, commercial release, and acceptance of perennial ryegrasses. The 1980s seems to be the decade for the turf-type tall fescues, and rightly so.

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