The Fine Fescues
— Their Morphology and Behavior

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Fine fescues are noteworthy not only for their attractiveness, but also for their ability to persist in dry shade under trees and on acidic or poor soils where most other grasses deteriorate. This is why seed mixtures formulated for shaded areas usually contain large percentages of fine fescues. In addition, fescues survive better than most grasses on sandy soils which have low fertility and tend to dry out quickly.

Fine fescues have certain weaknesses. Prolonged summer heat, coupled with wetness, close mowing, and heavy N fertilization may result in 'die-out' of large patches of fescue in solid stands. Recovery of these dead patches is more limited than in Kentucky bluegrass sod, because most fescues do not regenerate from rhizomes to the same degree as Kentucky bluegrass. In fact, Chewings-type and hard fescues depend solely on tillering to regenerate and fill bare spots. This has been a major reason for including Kentucky bluegrasses with the fine fescues in turf mixtures. Summer losses of fine fescues are generally attributed to disease associated with high temperatures and wet soil conditions. It must be remembered, however, that management practices such as overfeeding with nitrogen and frequent close moving increase disease problems.

Fine fescues in a seed mixture also play an important role in the establishment phase as a 'companion' grass. Under good growing conditions rhizomatous fescues are quite vigorous and will provide a protective cover within 3 or 4 weeks. With high cut and low intensity management these will become a permanent component of the turfgrass area. Ryegrass, which has been used traditionally as a companion grass to assure rapid coverage, tends to be initially overly competitive against Kentucky bluegrass but later may fail to persist.

The fine fescues showing the greatest potential for turf use can be subdivided into four major types. They are referred to in this discussion as Chewings, creeping, spreading, and hard fescues. The Chewings, creeping and spreading fescues are currently included in one species, *Festuca rubra* L., commonly called red fescue. However, the three types are very different in appearance, growth habit, management requirements, adaptation, breeding behavior and, in part, chromosome numbers. The reproductive isolation which occurs between these groups as a result of differences in chromosome number and/or time of flowering indicates that each should be regraded as distinct species.

The Chewings-type *F. rubra* L. subsp. *commutata* Gaud., is fine-leaved, non-rhizomatous and low-growing. Under mowing, these plants may spread slowly by basal tillering. Where summers are cool, they will tolerate rather close mowing. In warmer areas where red fescues are grown it is best to mow them at heights of 2 to 3 inches. A number of Chewings-type fescue varieties have been developed in recent years and have shown considerable promise in turf trials. 'Jamestown' is a dark green variety developed at the University of Rhode Island. 'Highlight' is a moderately light green, heavy seeding variety developed in the Netherlands.

Most Chewings-types, including 'Jamestown' and 'Highlight', are susceptible to powdery mildew. Their dense growth habit makes these varieties more competitive and persistent in mixtures with Kentucky bluegrass than varieties formerly available. Persistence in mixtures may be enhanced by decreasing the amount of fertilizer or increasing mowing height.

'Banner', a Chewings-type synthetic developed at Rutgers is composed of 45 clones from the Northeast and is being tested at various locations throughout the U. S. and Europe. Its performance to date has been encouraging and indicates it is worthy to be released. Seed of this variety is currently being increased in Oregon. All Chewings-type fescues flower before or at daybreak in the nursery and appear reproductively isolated from rhizomatous fescues which flower in the late afternoon.

The creeping types of red fescue are currently regarded by European taxonomists as *Festuca rubra* subsp. *tricophylla* Gaud. The creeping varieties have 42 chromosomes, and flower in the late afternoon. They are represented by such varieties as 'Cumberland Marsh', 'Dawson', 'Golfrood' and 'Oasis'. They are

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'Dawson' and 'Golfrood' are examples of 42 chromosome creeping fescues which produce fewer and thinner rhizomes than 'Fortress' and 'Novarubra' which are 56 chromosome spreading fescues.

Table 1. Characteristics of Fine Fescues

Type	Species	Height	Spread	Leaf Texture	Chromo. No.	Hour of flower	Typical Varieties	Color
Chewings	*F. rubra* L. subsp. *commutata* Gaud.	low	v. little	fine	42	6 a.m.	Highlight Jamestown Banner	lt. green dk. green med. green
Creeping	*F. rubra* L. subsp. *trichophylla* Gaud.	med.	little	med.	42	2-4 p.m.	Dawson Golfrood	med. green lt. green
Spreading	*F. rubra* L. subsp. *rubra*	mod. tall	good	broader (like Ky. bluegrass)	56	3-5 p.m.	Fortress Ruby Boreal	dk. green dk. green dk. green
Hard	*F. longifolia* Thuill.	low	v. little	fine	42	6-8 a.m.	C-26	dk. green
Sheeps	*F. ovina* L.	low	v. little	wiry	28,42	12 noon	none available	blue-green

fine-leaved, low-growing varieties with short thin rhizomes; and under mowing, they develop a turf appearance similar to the better Chewings fescues. Types such as 'Golfrood' have demonstrated good salt tolerance. Some of the most leaf spot resistant varieties are found in this group. The creepers are generally poor seed producers. Also, they may be destroyed by dollar-spot disease in New Jersey.

The spreading-types of fescue (*F. rubra* subsp. *rubra* L.) also flower in the late afternoon. They have 56 chromosomes, wider leaves, long spreading rhizomes and good seedling vigor. They are not as tolerant to close mowing and grow less dense than the creeping or Chewings-type varieties. Under New Jersey conditions, they have performed well in roadside tests when used alone or in mixtures with Kentucky bluegrass varieties. Their good seedling vigor makes the spreading fescues particularly valuable as a companion grass in the establishment phase. 'Boreal' and 'Ruby' are representatives of the spreading type fescues. A synthetic of six regionally adapted spreading fescues was developed at Rutgers in 1970. It is being tested at various locations under close and high mowing and it is receiving intensive study in New Jersey for roadside use Early performance has been favorable and seed increase is in progress in Oregon for contemplated release as 'Fortress'.

The hard fescues (*F. longifolia* Thuill.) have received considerable attention since the development and release of 'Biljart' hard fescue in Holland (better known in the U. S. as Scotts C-26). Because of the success of this new hard fescue variety, turfgrass breeders in both the U. S. and Europe are collecting hard fescues from old turf areas and initiating breeding programs with this species. The better hard fescues produce a turf comparable in texture and growth habit to the better varieties of Chewings-type fescue, have a slower vertical growth rate, resist some diseases better, and offer adaptation to some poor soil conditions. The color of C-26 hard fescue is an attractive deep green that persists in spite of moderate drought. Cool season dormancy often persists well into midspring which may be objectionable. The hard fescues have weak seedling vigor, fill in only by tillering, and appear to be rather slow to recover from wear and physical injury when grown in pure stands. Hard fescues flower in the nursery shortly after daybreak and the pollination season occurs prior to flowering of *F. rubra.*

The sheep's fescue types (*F. ovina L.*) are usually blue-gray in color. Their leaves are more prostrate than most grasses under mowing. The unusual leaf orientation and color contrast with other turfgrasses and contribute to heterogeneity as opposed to blending in mixtures. Sheep's fescues often predominate in shady or droughty areas that have been under low maintenance. This species flowers at mid-day (approximately) under New Jersey conditions and appears to be distinct and reproductively isolated from hard fescues. □

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many, but the technology exists to overcome them. The question now is, "Will we use it?"

SITE PLANNING CONSIDERATIONS

DO'S

1. Keep it convenient to refuse production centers;
2. Keep away from drinking and irrigation water supplies;
3. Consider possible future land use;
4. Consult state and Federal public health offices for assistance;
5. Use cover materials that are workable in all weather conditions and temperatures;
6. Take advantage of good public relations resulting from a shift to sanitary landfill program;
7. Use modern, efficient site equipment.
8. Plan to use secondary access routes to site.

DON'T'S:

1. Disturb natural drainage;
2. Locate on or near springs;
3. Locate on exposed rock strata;
4. Depend on clay or gumbo if avoidable;
5. Locate where access roads may be sometimes flooded;
6. Locate where trucks must be routed through residential areas.