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Extension FactSheet

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Cool-Season Turfgrasses for Sports Fields and Recreational Areas

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Selection of the proper turfgrass species is one of the most important decisions to be made when establishing a playing surface or recreational area. Since the turf is meant to be permanent, it is important to select a grass species adapted to the area and to the intended level of management.

The most important criteria when selecting grass species for recreational areas can be summarized as:

- Ability to tolerate heavy traffic and recuperate quickly.
- Quick seedling germination and establishment.
- Good annual color and ability to grow at low temperatures.
- Drought and heat stress resistance.
- Pest, disease and weed resistance.

Species Selection

In the northern United States and Europe, only a few species of cool-season grasses are useful for recreational areas. Each grass species has relative advantages and disadvantages based upon the above criteria. In essence, no grass species is perfect!

The recommended species are:

1. **Kentucky bluegrass (*Poa pratensis*)**
2. **Perennial ryegrass (*Lolium perenne*)**
3. **Tall fescue (*Festuca arundinacea*)**

Less common species, such as Supine bluegrass (*Poa supina*), have been used with varying degrees of success in more northern parts of the country.

Kentucky Bluegrass (KBG)

KBG is the primary recreational turfgrass, and with proper management, forms a fine-textured, high quality, long lasting turf. This species produces rhizomes (underground stems) that give rise to new bluegrass plants (Figure 1). Rhizome formation enables bluegrass to recuperate from injury and fill in thin areas.

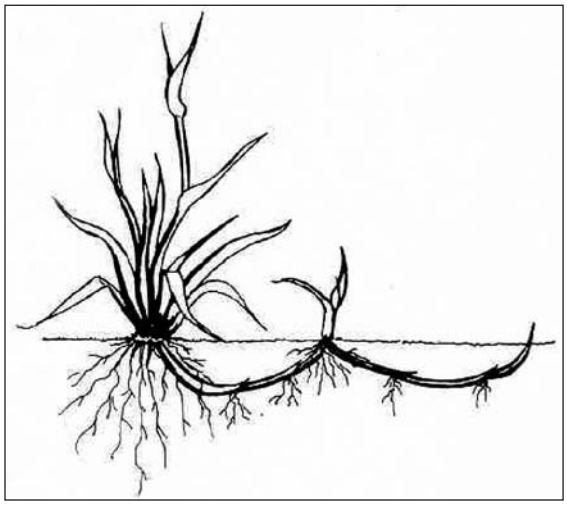

Figure 1: KBG plant, showing underground stems, or rhizomes, producing new plants.

Germination rates are slow to moderate and usually range from 10 to 21 days depending on conditions. Slow establishment rates mean that weed competition, notably crabgrass (*Digitaria spp.*), can inhibit KBG development, particularly in spring seedings when weed pressure is at its highest.

KBG seeded alone will usually require 6 to 9 months *minimum* for an acceptable turf surface.

During hot, dry periods it tends to become dormant and lose color and irrigation is often necessary.

KBG requires moist, well-drained soil to develop into a high quality turfgrass. A medium to high level of management is required with routine applications of fertilizer.

Most varieties respond well to a mowing height of 1.25 to 3 inches. Lower mowing heights mean more care (irrigation, regular mowing, fertility, etc.) or weeds will encroach.

Diversity Among KBG Cultivars

KBG cultivars are diverse in nature. For example, one cultivar may be more susceptible to a disease than another cultivar. Rutgers University has classified KBG cultivars into groups that display similar characteristics. The "Elite" grouping is the best for recreational areas as they produce good to excellent turf quality. There are several Elite types. Seed blends of KBG cultivars usually include 2 to 3 cultivars. For more genetic diversity, cultivars could also be selected from more than one Elite type subgroup (Table 1).

Table 1: Elite KBG Types

Groups	Traits
Compact	Compact, dark, long winter dormancy, good stress resistance
Midnight	Compact, dark, long winter dormancy, good stress resistance (except stem rust)
America	Fine leaf, high density, moderate winter dormancy and stress resistance
Mid-Atlantic	Medium-high density, deep roots and rhizomes, moderate winter dormancy, good stress tolerance
Julia	High quality, moderate winter performance, susceptible to brown patch, summer patch and dollar spot
CELA	Early spring green-up, moderate stress tolerance, good winter color
Aggressive	Dense growth habit, not necessarily traffic tolerant, variability among stress tolerances

Most recently, **hybrid bluegrasses** have become commercially available. Cultivars such as Thermal Blue (Texas bluegrass x Kentucky bluegrass) are becoming more popular as they are displaying improved drought resistance and excellent rhizome growth. There are several commercial cultivars currently available, including Thermal Blue, Reveille, and Solar Green.

KBG Bottom Line: Turf of choice but slow to establish.

Perennial Ryegrass (PRG)

PRG is a fine textured species with the potential to develop into a high quality, hardwearing turf. PRG has rapid seed germination (3 to 5 days) and seedling establishment qualities. This species has a bunch-type growth habit but it has excellent density through tillering (Figure 2).

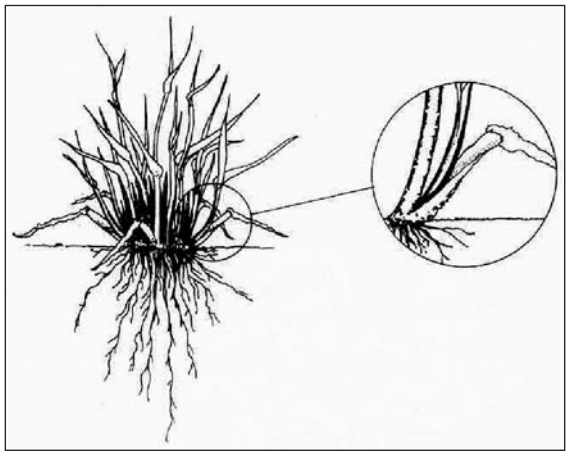

Figure 2: PRG plant, showing bunch-type growth habit. New shoots (tillers) are highlighted.

The cold tolerance and disease resistance capabilities are less than for KBG and all ryegrasses require well-drained soils of medium to high fertility.

Diseases that frequently occur on PRG include:

- *Red Thread* (typically in spring).
- *Dollar spot* (typically in summer).
- *Rust* (typically in the fall).
- Devastating diseases such as *grey leaf spot, pythium,* and *brown patch* can also cause problems in July, August, and September.

PRG has moderate drought resistance and requires irrigation to maintain quality during most summers.

PRG may contain endophytes—symbiotic fungi that improve tolerance to insects such as bluegrass billbugs.

PRG is seldom seeded alone. Many commercial mixtures of ryegrass with Kentucky bluegrass are available. When mixed with KBG, the ryegrass component of the mixture is usually between 10 and 50%. As with KBG seeding, the PRG component of mixtures should be comprised of at least two differ-

ent cultivars. The amount of PRG in KBG mixtures will depend on the time period between seeding and anticipated use. Shorter time periods between seeding and use will require higher percentages of PRG in the mixture (see Table 2). During the playing season, PRG is the over-seeding grass of choice. Bare areas should be over-seeded weekly with PRG.

Note: If the PRG component in a mix exceeds 20% by weight, it will dominate the final turf stand.

Most varieties respond well to a mowing height of 1.0 to 2.5 inches.

Table 2: Timing and Seed Rates

Time between Seed and Play	Grass	% Weight	Rate lbs/M
9 months	KBG	100	1-3
9 months	TF	100	4-8
9 months	TF+KBG	90:10	4-6
6 months	KBG+PRG	80:20	2-3
3 months	KBG+PRG	50:50	3-5
< 3 months	PRG	100	6-8
Over-seeding	PRG	100	6-10*
Over-seeding (traditional mix)	KBG+PRG	50:50	3-5
Dormant Seeding	KBG	100	3-4

* If there is bare ground and the aim is to get full cover in as short a time as possible, seeding rate could be increased.

Transitional and annual ryegrasses were recently introduced as over-seeding tools for high traffic areas, particularly sports fields used in the fall. Both germinate and establish rapidly. Transitional ryegrass has more perennial traits (darker green, high density) than annual ryegrass.

PRG Bottom Line: Quick to establish but susceptible to many diseases.

Tall Fescue (TF)

TF has been used traditionally as a low-medium maintenance grass in areas where a coarser texture is not objectionable. It is tolerant of low fertility and persists well under low maintenance situations and shaded areas. In the last few years, a number of improved "turf-type" tall fescue cultivars have been commercialized and they are much improved in quality.

Seeds will germinate and establish quickly (5 to 7 days) but slightly slower than perennial ryegrass. *When mature,* TF has excellent wear tolerance and, due to its deep-rooted nature, resists drought and will remain green throughout most summers.

TF can be mixed with KBG if the TF is the dominant species (90 to 95% TF) but it does not mix well with PRG as they both form clumps and TF goes dormant quicker than PRG in the fall. If TF is not over-seeded regularly and mowed at the lower end of the preferred range, it will form clumps.

Newer cultivars have good color, density and a greater tolerance of low mowing (1.5 to 3 inches). TF has moderate disease tolerance but is susceptible to brown patch, especially in July and August.

Tall Fescues With Rhizomes?

TF has rhizomes as a recessive trait, so it is considered a "bunch type" grass. However, some cultivars display more rhizome activity than others. Rhizome development in a full stand of turf on native soils is not as evident as the rhizome development on sandy soils in a low density turf, suggesting that soil compaction and sward density affect rhizome development. Research to date has suggested that rhizome development appears to take around two growing seasons (Figure 3).

TF Bottom Line: Good for low maintenance areas. Watch for brown patch disease in summer.

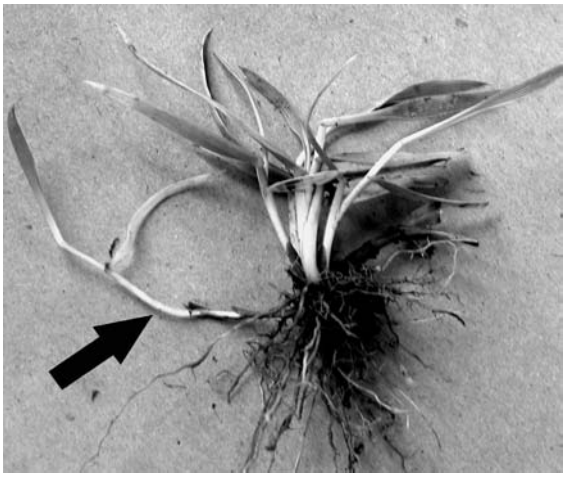

Figure 3: TF plant showing short rhizome with daughter plant.

Tips for Successful Seeding

Choosing the Right Cultivar

As a rule of thumb, it is best to blend three to five cultivars if one type of grass is chosen. If a mix of grass is desired (e.g. KBG:PRG mix), two cultivars of

each are best. This offers the best diversity and possible resistance to certain disease or insect problems. The National Turfgrass Evaluation Program (NTEP) has a website that lists all turfgrass cultivars and ranks them for quality, stress tolerance etc. The information is free and can be seen at **www.ntep.org**. An overview of cool season grass traits can be seen in Table 3.

Table 3: Pros and Cons of Cool-Season Turfgrasses for Recreational Areas

Trait	KBG	PRG	TF
Wear Tolerance	M-G*	G	G
Recuperative Potential	G	M	F
Quality	G	G	M
Establishment Speed	F	E	M
Drought Resistance	F-M	G	G
Drought Tolerance	G	F-M	F-M
Insect Avoidance	F-M	M-G	G
Disease Avoidance	M	F	F-M
Shade Tolerance	F	F	G
Fall & Spring Color	F-M	G	M

*KEY: Excellent (E), Good (G), Medium (M), Fair (F)

Seeding at the Right Time

The best time to seed in the northern United States is mid-August to mid-September. This timing offers many advantages:

1. Warm soil
2. Greater possibility of rainfall to aid germination
3. Not as much competition from weeds as in spring

As a rule of thumb, optimum air temperatures for germination of cool-season grasses is between 59 and 86ºF.

Starter fertilizer applications, made during the growing season, in conjunction with seed applications, will enhance seedling development.

In summary, establishment speed dictates which grass to seed at any given time. *KBG is slow* to establish, *TF is moderate*, *PRG is quick*. As mentioned above, this gives PRG the competitive edge and it will dominate in a mix.

PRG is seen as the grass of choice for over-seeding bare areas in the fall, but KBG should be seeded in the spring and as dormant seedings late fall/winter to try and maximize the KBG in a sward.

Suggested KBG:PRG Annual Seeding Program

November to December: Dormant seed 100% KBG that will germinate the following spring. Higher seed rates should be used to compensate for a higher seed mortality rate than a conventional spring seeding.

April to May: Spring seed 100% KBG in conjunction with a pre-emergence herbicide that will not affect KBG germination, e.g. Siduron (Tupersan)*

June and July: If temperatures allow and irrigation is adequate 50:50 KBG:PRG mix (PRG will dominate). Irrigation is critical.

Mid-August to Early September: 50:50 KBG:PRG (PRG will dominate).

September to Late October: 100% PRG. Seed bare soil areas weekly at 6 to 8 lbs/1000 sq. ft.

*More information on weed control in new seedings can be found in the online Bulletin L-187, *Management of Turfgrass Pests Weeds, Diseases, and Insects* at **http://ohioline.osu.edu/l187/index.html**.

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