

Choose Kentucky Bluegrass Types to Develop Improved Blends

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Kentucky bluegrass (*Poa pratensis* L.) is the most widely used cool-season turfgrass in the United States. The popularity of Kentucky bluegrass is due to its ability to develop dense turfs of pleasing color and clean mowing quality. Its extensive rhizome system provides the ability to recuperate after stress periods and fill in damaged areas.

Since Kentucky bluegrass reproduces through an asexual process called apomixis, improvement in cultivar performance is challenging. However, apomixis also provides the opportunity to produce true-to-type seed from superior plants generation after generation.

Over the past several decades, more than 200 cultivars of Kentucky bluegrass have been released. Kentucky bluegrass cultivars have been developed through a number of approaches including: selection of naturalized ecotypes; selection of successful, highly apomictic plants found in old pastures or turfs, and selection of single, highly apomictic plants from breeding programs using intra- and inter-specific hybridization.

Turfgrass breeders have traveled throughout the United States and the world collecting Kentucky bluegrasses that have persisted under a range of environmental conditions. Many genotypes have been identified that vary dramatically in disease resistance, stress tolerance and growth habit. As expected, many of the Kentucky bluegrass genotypes are best adapted to regions that are climatically similar to their site of collection. Thus, Kentucky bluegrass plants can be classified based on climatic region of adaptation as well as growth habit and turf performance.

More recently, with improved breeding techniques (Pepin and Funk, 1971), hybrids can be developed successfully, and the genetic background of the parents may also be useful in classification.

Kentucky bluegrasses are classified into

three general categories: Elite turf types, BVMG turf types and common type. Prior to the release of Merion in 1947, common-type Kentucky bluegrasses (Category III) were the predominant type used for turf.

The common-type bluegrasses perform best under low-maintenance conditions, but are highly susceptible to leaf spot caused by *Drechslera poae* (Baudys) and melting-out disease caused by *Bipolaris sorokiniana* (Sacc. In Sorok), particularly under higher maintenance situations.

Merion, discovered by Joseph Valentine in the early 1930s, was resistant to leaf spot disease and greatly increased the usefulness of Kentucky bluegrasses in regions with a humid, temperate climate.

Turf-type Kentucky bluegrasses (Categories I and II) have a lower, more prostrate growth habit, respond well to higher management inputs, tolerate closer mowing and have greater resistance to leaf spot disease than common-type bluegrasses.

The main classification types in Categories I and II include Compact, Julia, Bellevue, Mid-Atlantic, Aggressive, Shamrock types and BVMG (named after Baron, Victa, Merit and Gnome) (Bara et al., 1993). It should be noted that this classification system continues to be refined as more cultivars are developed and their distinct turf characteristics are expressed in research trials.

Category 1

Compact type. Cultivars within this group are characterized by low, compact growth (Bonos et al., 2000) and possess good to excellent resistance to leaf spot disease (Murphy et al., 1997).

Many cultivars can form a highly attractive turf after green-up in late spring, with some cultivars producing excellent turf quality. Top performers in New Jersey turf trials are Moonlight, Princeton P-105, Blackstone, Langara and Blacksburg. Generally, these cultivars exhibit good resistance to stripe smut disease (*Ustilago striiformis*), have long winter dormancy and a purple coloration during cold weather. Black-

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stone tends to exhibit better winter performance than most other cultivars in this group. Performance during summer heat and drought stress is variable.

Due to the low, compact growth habit, cultivars within the compact type may be the most suitable for fairways, especially in areas where Kentucky bluegrass thrives — climates with bright sun, low humidity and cool nights.

Compact-Midnight type. Within the compact type, a number of cultivars exhibit similar growth and performance characteristics to the cultivar Midnight. They have long winter dormancy with late-spring green-up. These cultivars characteristically have a dark green color with good to excellent turf quality and good heat tolerance. These cultivars are susceptible to powdery mildew (*Erysiphe graminis*), so use in shaded areas should be limited.

Many of these cultivars have good resistance to summer patch disease (*Magnaporthe poae*), an important disease at low cutting heights.

Compact-America type. Within the compact type, a number of cultivars exhibit similar growth and performance to the cultivar America. These cultivars have finer leaf texture and higher density than other compact-type cultivars. They have moderate winter dormancy and, unlike the Compact-Midnight type, have good resistance to powdery mildew.

Julia type. This group of cultivars exhibits similar growth and performance characteristics to the cultivar Julia. This group of cultivars has a medium-low growth habit and can form highly attractive turf. They have moderate winter performance, good resistance to leaf spot and stripe smut, but can be damaged by dollar spot (*Sclerotinia homoeocarpa*) and brown patch (*Rhizoctonia solani*) diseases.

Bellevue type. These cultivars form a turf with medium growth, medium-wide leaves and medium-shoot density (Bonos, et al., 2000). This group characteristically exhibits excellent cool-season vigor, which is evident by excellent color retention and turf quality during the winter, and early spring green-up.

Cultivars within this group can become stemmy in turf plots from seedhead formation in late spring. This group of cultivars exhibits some susceptibility to billbug feeding.

Mid-Atlantic ecotype. This group of cultivars forms a vigorous turf of medium density with a deep, extensive root and rhizome sys-

tem. In general, this group has moderate susceptibility to leaf spot disease; an exception is SR 2000, which has good resistance.

The ability to recover from leaf spot damage and other stresses is excellent and results from the deep, extensive rhizome system. This type exhibited good tolerance of summer stress (Bonos and Murphy, 1999) without supplemental irrigation under New Jersey conditions. This group has moderate to good winter performance. The cultivar Eagleton has shown repeatedly in New Jersey turf trials to be resistant to billbug (*Stenophourous spp.*) feeding, which is a serious and often misdiagnosed problem on many Kentucky bluegrass turfs in the Northeast.

The Mid-Atlantic ecotype would be a good component of low- to moderate-maintenance seed blends and mixtures. It would perform well on golf course roughs because of its medium density, and ability to maintain active green growth during extended drought and heat-stress periods.

Aggressive type. This group of cultivars shares two common characteristics: aggressive lateral growth and a turf with high shoot density. An aggressive, dense growth may be advantageous for highly trafficked turfs and can hasten the development of a mature sod. Aggressive cultivars can dominate other cultivars or species when used in blends or mixtures.

If aggressive cultivars dominate a stand, this could lead to the rapid expression of the cultivar's strengths or weaknesses. Other turf characteristics are variable within this group (Bonos et al., 2000; Murphy et al., 1997).

Shamrock type. Cultivars within this type exhibit characteristics similar to the cultivar, Shamrock. These cultivars exhibit good leaf spot resistance, moderate winter performance and are susceptible to billbug feeding. They have the potential for high seed yield. Compared to the BVMG type, Shamrock-type cultivars have less seedhead formation in turf plots and show better resistance to stripe smut disease, although SR 2100 is susceptible.

Other type. This preliminary grouping of cultivars and selections possess characteristics intermediate between two or more previously described groups. Further study is needed to identify new classification groups of cultivars or determine specific characteristics common to a known group.

Category II

BVMG type (*Baron, Victa, Merit, Gnome type*).

This widely used group of cultivars has high seed yield potential and can generally produce medium-good quality turf in the absence of stripe smut disease.

These cultivars have medium-low growth, medium-wide leaves, and produce a medium-density turf. They can become stemmy in mowed turf plots from seedhead formation in late spring. The BVMG type has moderate resistance to leaf spot disease, but entries evaluated in long-term trials in New Jersey are susceptible to a new strain of stripe smut disease.

Dragon shows better resistance to stripe smut disease than other cultivars. They generally have poor winter color, long winter dormancy and can suffer significant billbug damage. This type isn't recommended for golf courses because of its stripe smut susceptibility.

Category III

Common type (formerly Midwest Ecotypes). These cultivars and selections, frequently referred to as "common" Kentucky bluegrass, have an erect growth habit and narrow leaf blades (Bonos et al., 2000). Common-type Kentucky bluegrasses are useful for conservation purposes, permanent pastures and low-maintenance utility turf, which makes them a candidate for naturalized or infrequently mowed areas on large-acreage commercial and residential turfs, and golf courses.

Many of these cultivars were selections of naturalized ecotypes found in old pastures of the midwestern United States. They produce seed early and economically, exhibit good stress tolerance and often survive summer drought in a dormant condition. However, these common-type bluegrasses can suffer severe turf loss from leaf spot and melting-out disease under conditions of close mowing in humid environments.

A few experimental selections do show improved leaf spot resistance in New Jersey turf trials.

Summary

Kentucky bluegrasses have many uses on athletic fields, home lawns and golf courses, including roughs, naturalized areas and some potential for fairways and tees.

The compact-type cultivars, including the Midnight and America types, have the greatest potential for low-mowing tolerance. Low-mowing tolerance will be greatest in regions with bright sun, low humidity and cool nights. The aggressive-type cultivars have the greatest potential for highly trafficked turfs and athletic field situations. The Mid-Atlantic-type has the greatest potential for golf course roughs, higher-cut home lawns and areas prone to drought stress in the Northeast.

Blends of three or more Kentucky bluegrass cultivars should be used for optimum performance. Blends for surrounds, roughs or fairways should include elite cultivars from Category I that are similar in appearance, leaf texture and color, but more diversified in environmental stress and pest tolerance. Combining the diverse strengths of more than one Kentucky bluegrass cultivar will optimize adaptability of the turf blend or mixture.

Turf managers should evaluate the results of NTEP trials conducted under climatic conditions similar to their regions for the most accurate evaluation of cultivars. Considerably more improvement is needed for low-mowing tolerance, summer-patch resistance, annual bluegrass competition and quicker establishment before Kentucky bluegrass is used to its fullest potential.

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QUICK TIP

Because summer stress is caused by a complex of diseases including brown patch and Pythium that varies from course to course, it's essential to apply a tank-mix of broad spectrum fungicides to manage the disease. In addition, careful monitoring of results will provide you with a better understanding of which products best fit your situation.

Always Read and Follow Label Directions

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