## Research Summary

# Polystand Composition Succession of Cool-Season Turfgrass Communities

Investigations were conducted in which turf-type tall fescue (*Festuca arundinacea*), dwarf tall fescue, Kentucky bluegrass (*Poa pratensis*), and perennial ryegrass (*Lolium perenne*) were seeded in eight combinations as species mixtures at two locations under irrigated and non-irrigated conditions. The experimental site was established in 1991 on a silt loam soil in central Missouri. The turfs were mowed at 0.75 and 2.0 inches (19–51 mm), twice weekly with the clippings returned. The experimental area was fertilized with 1.0 lb per 1,000 $ft^2$ (48 kg • $ha^{-1}$) of 20 N-4 P - 8 K in March, September, October, and November, for an annual total of 4 lb per 1,000 $ft^2$ per year (192 kg • $ha^{-1}$ $yr^{-1}$). A modified Brinkman Traffic Simulator was applied to the turfs in October 1993, involving 15 passes on one-half of each mowed plot at an interval of three times per week for two weeks. The plot layout was a randomized complete block design in a split-split-plot arrangement with three replications. The study involved a five-year period of observations.

**Perennial ryegrass became the dominant species in all polystands with tall fescue, Kentucky bluegrass, or both. This study revealed that the seed mixtures containing only 20% perennial ryegrass by weight with Kentucky bluegrass will eventually result in dominance by the perennial ryegrass under the conditions of this investigation.**

After five years the turf-type tall fescue comprised 82% of the polystand with Kentucky bluegrass, while dwarf tall fescue comprised 48% of the polystand with Kentucky bluegrass.

**The Kentucky bluegrass was more competitive to tall fescue in the irrigated than in the non-irrigated experimental area.** The mowing height caused small changes in polystand composition from year to year, while the one period of simulated traffic had little effect on the polystand composition one year following the stress simulation treatment. In terms of turf recovery following traffic stress stimulation, polystands containing Kentucky bluegrass with tall fescue recovered more rapidly than a blend of tall fescue cultivars.

**There was a distinct advantage in using a mixture of species, compared with the use of an individual species in terms of reducing the severity of disease occurrence.** Dollar spot (*Sclerotinia homoeocarpa*) was the most prevalent disease during the five-year period and infected primarily the perennial ryegrass, with little occurrence on Kentucky bluegrass. Brown patch (*Rhizoctonia solani*) occurred primarily on the tall fescue, and occasionally on the perennial ryegrass. The irrigated turf plots tended to have more dollar spot. Brown patch damage was more apparent on the non-irrigated plots of tall fescue, possibly because of the slow recovery rate from disease injury.

***Comments.*** The relative competitive ability and the resultant composition of cool-season turfgrass polystands can vary with the location in which the experiment is conducted. This is to be expected in that the environmental stresses and types of disease/insect problems may vary in severity and in relation to the particular turfgrass species they most strongly influence. Thus, **in the interpretation of results from polystand composition studies one should consider the particular regional environment rather than making broad continent application.**

***Source.*** *Turf performance of mixtures and blends of tall fescue, Kentucky bluegrass, and perennial ryegrass* by J.H. Dunn, E.H. Irvin, and B.S. Fresenburg. *HortScience* 37(1):214–217, 2002.

## Turfgrass Culture Under Tree Shade

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was planted to achieve the desired initial landscape effect. The original intention was for many of these trees to be removed over time as adjacent trees grow larger.

Wind movement can be improved by judicious pruning and/or the elimination of thick underbrush and shrub plantings that form dense encircling screens. **Maximum air drainage is achieved if selective clearing of underbrush is done in the direction of prevailing winds.** The beauty of a landscape is sometimes enhanced by new vistas through selective shrub or tree removal. More favorable temperature and relative humidity regimes are the benefits of unimpaired air movement. Disease development is also reduced due to the lower relative humidity and more favorable conditions for drying.

Most tree species are shallow rooted. The roots will extend beyond the perimeter of the tree drip line into adjacent irrigated turf areas. Root competition for water is especially critical in dryer climates and in situations where trees are growing adjacent to an irrigated turf. **Pruning of shallow tree roots is an effective practice in alleviating competition for nutrients and water. The best approach is trenching to a 2- to 3-foot (0.6–0.9 m) depth at a 4- to 5-year interval.** The installation of vertical physical barriers is seldom effective.