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 turfbs 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 ft² (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 ft² 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.