

# Can Ryegrasses Speed Establishment of Kentucky Bluegrass Fairways?

Fairway cover is accomplished faster when ryegrass is in the mix, but with negligible bluegrass establishment.

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Throughout the Appalachian Highlands of the Transition Zone, perennial ryegrass (PR) is a predominant species used on golf course fairways. Its rapid establishment rate, dark green color, medium-fine texture and density, ease of striping, good wear tolerance, and persistence at mowing heights down to 0.5 inch make it a desirable fairway choice. In areas of high *Poa annua* pressure such as the Appalachian Highlands, PR's high tolerance level to ethofumesate (Prograss®) has also favored its use. However, epidemics of gray leaf spot (*Pyricularia grisea*) in the summer of 1998 destroyed many PR fairways across the Mid-Atlantic and Midwest regions.

Kentucky bluegrass (KB) is not affected by gray leaf spot and has many of the same turfgrass qualities as PR. So why has it not been used more extensively for fairways in the upper transition zone? Until the mid-1990s, no cultivars were available that performed adequately at present-day fairway heights of 0.5 to 0.75 inch. Additionally, KB is sensitive to ethofumesate injury and is slow to germinate and establish. While spring-seeded PR fairways may be ready to open by June 1, KB may not be ready until August 1. Recent advances in breeding compact-type Kentucky bluegrasses have resulted in the release of five to ten cultivars that university research suggests will persist and function as a high-quality fairway at mowing heights down to 0.5 inch. Although there are now promising fairway culti-



Bluegrass cultivars produce an excellent playing surface, but they are slow to establish from seed. Research has shown that seed mixtures consisting of ryegrass percentages more than 15% do not allow bluegrass seed to compete for space.

vars available, the superintendent is always pushed to renovate and reopen as fast as possible, and on this point the slow-germinating bluegrasses are a handicap.

Our objective was to determine whether Transist intermediate ryegrass (IR), when planted as a companion with KB, would allow for the rapid establishment of a fairway playing surface while not unduly inhibiting KB development. Intermediate ryegrasses are a cross between perennial ryegrass and annual ryegrass. They were developed as bermudagrass fairway overseeding alternatives to PR. Intermediate

ryegrasses are similar in texture and color to PR, but their relatively poor heat tolerance allows a smoother spring transition back to a bermudagrass playing surface. In short, we were hoping to take advantage of the characteristics of both species: fast germination of the ryegrass followed by summer decline to leave behind the KB as the permanent playing surface.

This trial was conducted on a portion of the eighth fairway at the Virginia Tech golf course. Glyphosate (Roundup Pro™) was applied twice in April 2001, the area was verticut aggressively and the dead vegetation

removed, and lime was applied to raise the soil pH to 6.5. On May 1, four compact-type Kentucky bluegrass cultivars (America, Apollo, Unique, and Rambo) were either planted alone at 2 lbs/1000 ft<sup>2</sup> or in mixes with Transist IR or Phantom PR at 4.5 lbs/1000 ft<sup>2</sup>. Seeding at these rates meant that 70% of the seeds applied to each mixed plot was KB, while 30% was either PR or IR. Also applied at seeding were a starter fertilizer (1 lb N/1000 ft<sup>2</sup> from 10-10-10) and Tupersan® (siduron) for preemergence crabgrass control.

Mowing began on May 29 at a one-inch height, twice per week. Chlorothalonil was applied in May and June for dollar spot control, and a 20-20-20 fertilizer was applied at 0.5 lb N/M on May 15 and May 29. On June 11, the area was turned over to the superintendent to receive regular course maintenance, including mowing three times weekly at 0.75 inch. No fungicides were applied after early June 2001 in an attempt to disfavor the ryegrasses.

## RESULTS

On May 31, at four weeks after seeding (WAS), most of the PR+KB and

IR+KB mixes had attained 70% to 80% cover and a quality level of 5 to 6, indicating that these plots were “ready to open” (Table 1). At this point the KB-alone plots had attained only about 25% cover. Sufficient cover for opening was not reached on KB-only plots until about July 24, almost two months later than the mixes containing either ryegrass. None of the KB cultivars developed faster than the others.

Direct counts of the species present in each plot by July 31 indicated that almost no KB had established in PR or IR mixes (Table 1). It is clear that the ryegrasses germinated and developed so quickly that the slow-germinating KB, even though it made up 70% of the seed planted, was not able to compete effectively for resources (space, light, nutrients, water) and become established. Conditions during the 2001 summer were cooler than normal, providing extended dollar spot disease pressure without any substantial periods when more devastating ryegrass diseases such as gray leaf spot, Rhizoctonia blight, or pythium blight could develop. Basically, it was a very good growing season for both bluegrasses and rye-

grasses. By the next spring all plots had obtained nearly 100% cover. However, removal of all species but KB in each plot with selective herbicides in the fall of 2002 revealed that much of this cover was due to *Poa annua* invasion (Table 1). Our results indicated that Rambo and Unique were the most competitive with *Poa annua* and the ryegrasses.

## SUMMARY

The four compact-type Kentucky bluegrasses in this trial were able to persist at a 0.75-inch fairway height. However, they were not competitive with PR or IR and were invaded easily by *Poa annua*. Future attempts at hastening establishment of KB fairways in the Appalachian Highlands of the Mid-Atlantic should include 5% to 15% PR or IR by seed count rather than 30%.

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**Table 1**

Visual quality, estimated percent cover, and tiller density of Kentucky bluegrass monostands or mixes with intermediate ryegrasses or perennial ryegrasses

Treatment	5-31-01		7-24-01		Tillers/cup cutter plug on 7-31-02		3-25-02		Percent KB present or removed herbicidally by 10-1-02	
	Quality	Cover	Quality	Cover	KB	IR/PR	Quality	Cover	KB	Other
America KB	2.8	24	4.4	73	60	0	5.9	94	37	63 <i>Poa</i>
Apollo KB	2.8	26	4.5	69	58	0	6.3	96	46	54 <i>Poa</i>
Rambo KB	3.0	21	4.6	68	69	0	5.8	97	61	39 <i>Poa</i>
Unique KB	2.5	26	5.0	65	72	0	5.9	93	66	34 <i>Poa</i>
America + PR	5.3	55	5.5	89	1	81	7.0	99	8	92 PR
America + IR	6.0	73	5.5	88	1	51	5.8	97	13	87 IR/ <i>Poa</i>
Apollo + PR	6.0	70	5.6	91	1	56	6.8	99	7	93 PR
Apollo + IR	6.0	75	5.5	94	1	54	6.0	97	20	80 IR/ <i>Poa</i>
Rambo + PR	5.5	69	5.9	89	1	75	7.3	99	12	88 PR
Rambo + IR	5.5	88	5.3	85	2	67	5.5	96	13	87 IR/ <i>Poa</i>
Unique + PR	4.5	64	5.3	79	1	64	6.8	99	12	88 PR
Unique + IR	5.8	70	5.5	93	2	52	5.6	95	29	71 IR/ <i>Poa</i>
LSD (0.05)	1.3	18	0.9	19	17	26	0.5	4	16	NA