

PROGRESS REPORT

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TITLE: Determining Best Management Practices To Convert A
Putting Green From Pennncross To A New Variety

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DEPT: Genetics (AJD*) and Crop Science (DCB, AHB)

For several decades, 'Pennncross' was the creeping bentgrass of choice for putting greens. This has changed over the past two years with the introduction of several new bentgrass varieties with improved stress tolerance or better shoot density, and the trend will continue as more new varieties are released. Many superintendents are interested in replacing Pennncross with one of the new bentgrasses, but are uncertain of how to accomplish this without resorting to complete renovation. This study is designed to evaluate several methods by which an existing Pennncross green may be converted to one of the new bentgrass varieties.

One of the challenges in addressing the question of conversion is to develop methods to quantify the success of conversion. Simple visual examination is not possible, since bentgrass varieties are essentially indistinguishable based on morphological characteristics. We are using an existing molecular technology, Restriction Fragment Length Polymorphism (RFLP) to determine population composition. This method can be used to determine the relative percentages of two (or more) varieties in bulk tissue samples (clippings).

The following fall treatments, applied each September, are being evaluated for their effect on bentgrass conversion:

1. Control, no interseeding
2. Broadcast interseeding with L93 and A4
3. Cultivation with Job Saver[®] tines plus broadcast interseeding
4. Verticutting plus broadcast interseeding
5. Primo[®] plus Job Saver[®] cultivation plus broadcast interseeding
6. Primo[®] plus verticutting plus broadcast interseeding

Primo[®] was applied at a rate of 0.3 oz/1000 ft² 3 days before interseeding. Success of the treatments are being evaluated annually for at least three years by sampling clippings from each plot and subjecting them to molecular genetic analysis.

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Leaf tissue was sampled from the plots in late August. DNA was extracted and Southern analysis was conducted using a RFLP probe which distinguishes A4 from Penncross.

Computer imagery and data analysis indicates that conversion from Penncross to A4 during the first year occurred to the greatest extent with the JobSaver plus Primo[®] treatments (Table 1). Conversion was approximately 20%. The least effective treatments were verticutting and verticutting plus Primo[®]. These results led us to cultivate the plots more aggressively in year two, hoping to open up the canopy more and provide a more favorable environment for the seedlings.

Treatment	Conversion, % of A4
Control, no interseeding	0 c
Broadcast seeding	13.8 abc
JobSavers	16.2 ab
JobSavers + Primo [®]	21.2 a
Verticutting	2.5 bc
Verticutting + Primo [®]	2.5 bc

Values followed by the same letter are not significantly different at $P = 0.10$

The data indicate that conversion from Penncross is probably feasible, but that it will take a number of years. Further, it seems likely that complete conversion, in which Penncross is completely eliminated, may not be possible.