Converting Existing Putting Greens Through Interseeding

By Marcus A. Jones and Nick E. Christians

Managing annual bluegrass (*Poa annua*) during periods of high environmental stress can be challenging to say the least. I learned how difficult it can be during my time as an assistant golf course superintendent. Our putting greens, with a mixture of Penncross and Washington bentgrasses, had long ago given way to annual bluegrass, a common problem at many long-established facilities. Fairways and tees also had considerable amounts of *Poa*.

In the turf industry *Poa* is a fact of life, an inevitable invader of intensely managed landscapes. While *Poa* can provide an acceptable playing surface, we were committed to extensive chemical inputs to maintain quality conditions and our approach was becoming unsustainable given our shrinking budget.

We needed to renovate our playing surfaces and were anxious to utilize the newest bentgrass cultivars with their improved agronomic characteristics and increased competitiveness against *Poa*. The only problem was we couldn't afford the stoppage of play that accompanies a traditional renovation.

In the end, we were stuck trying to manage our existing playing surfaces. When I decided to return to school for my doctorate, deciding on a research project was easy: renovating existing putting greens through interseeding.

What the literature says

A review of the interseeding literature is quite divided. Many people within academia have experimented with interseeding and their results are all but unanimous: Interseeding doesn't work. Yet many researchers from industry and turfgrass practitioners contend to find value in the practice.

Those who have had marginal success often have to disrupt the playing surface to the extent that quality and uniformity are severely compromised. The difficulty of establishing new cultivars is often credited to the inability of the seedlings to compete with mature plants for soil moisture and nutrients. However, a study conducted by Rutgers University provided a small glimmer of hope.

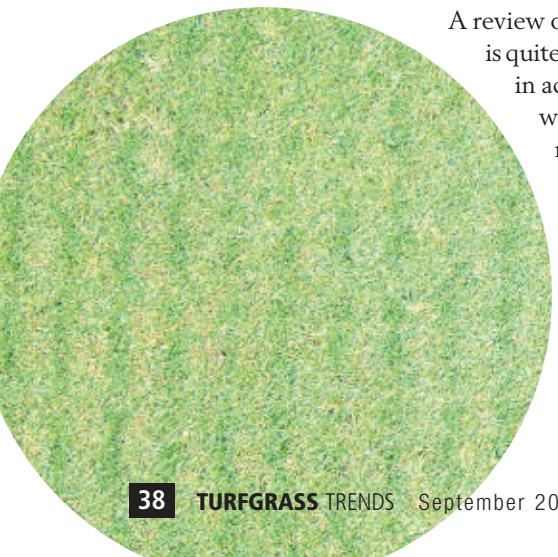
The Rutgers study investigated the effects of seeding date and interseeding cultivar on the establishment of creeping bentgrass into an annual bluegrass putting green. The results of their work suggested mid-summer seeding dates resulted in the greatest conversion and that recently released cultivars of creeping bentgrass are better suited for interseeding compared with traditional cultivars such as Penncross.

Our approach to interseeding

We first evaluated a number of creeping bentgrass cultivars to identify which was the most aggressive from a germination standpoint. Knowing that the seedling would be faced with competition from the existing turf, it was important that we selected a bentgrass cultivar of high vigor. Based on our results, we chose Penn A-4 as our interseeding species.

A second strategy was to attempt to create a soil seedbank of creeping bentgrass. Research suggests that creeping bentgrass can remain viable in the soil years after being planted. A large soil seed bank is one reason why *Poa* is so successful at colonizing established putting greens. Borrowing this concept, we utilized multiple interseeding events throughout the season using a Maredo spiker/seeder. Interseeding was performed either two or nine times to supply yearly totals of 4.5 or 13.5 pounds per 1,000 square feet Penn A-4.

We also used generous seeding rates (1.5 pounds per 1,000 square feet) each time we interseeded in order to account for the high mortality rates expected from traffic and plant competition.



A vigorous renovation plot in the fall. One clearly can see the seedlings emerging through the canopy.

PHOTO COURTESY: MARCUS JONES

Finally, we incorporated Trimmit growth regulator and Velocity herbicide into the trial. The hope was that we could reduce the competition from the existing turf with the use of these products. Velocity applications started the first week of June and were applied at two ounces per acre every 14 days for a total of four applications. A fifth and final application of Velocity was made October 1. Trimmit applications also started June 4 and were applied at 6 ounces per acre every 14 days for a total of eight applications.

The interseeding trial was conducted at a local golf course on their practice putting green and on a research green at the Iowa State University Horticulture Research Station. Regular maintenance practices were only slightly altered as the goal was to preserve conditions that would allow play.

Mowing was performed daily to a height of 0.125 inches and overhead irrigation was applied as necessary. Fertilizer (7N-7P-7K) was applied at a rate of 0.25 pounds N per 1,000 square feet each month of the growing season and diseases and insects were controlled as necessary.

Does it work?

The 4.5 and 13.5 pounds per 1,000 square feet seeding regimes resulted in a 19% and 39% conversion to Penn A-4, respectively, on the golf course putting green the fall after interseeding (Figure 1).

Penn A-4 populations were reduced to 1% and 8% the next spring (Figure 2).

These data indicate a transient shift to Penn A-4 occurred but was not able to persist.

Furthermore, applications of Trimmit or Velocity did not hasten conversion to Penn A-4 (Figures 1 and 2). The percentage of annual bluegrass was reduced from approximately 60% to 20% in plots treated with Velocity during the first year of the study. However, significant loss of density was observed during the second year of the study from Velocity applications.

Conversion was more persistent on the research putting green. The 13.5 pounds per 1,000 square feet seeding regime resulted in a 42% establishment of Penn A-4 the fall following interseeding. Evaluation of the plots the following spring revealed 45% Penn A-4 still present. Although interseeding was more successful in the research setting, the overall quality of the turf would not be acceptable for most putting greens.

These results suggest that the level of maintenance and overall quality of the putting surface influence the success of conversion. Conversion through interseeding in this study was unsuccessful when the plots were maintained under golf course conditions. Interseeding was only successful when conditions were allowed to deteriorate below acceptable levels. The overall conditioning of the putting surface in order to permit interseeding needs to be weighed against the cost of a traditional conversion when deciding on a renovation program.

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FIGURE 1: CONVERSION

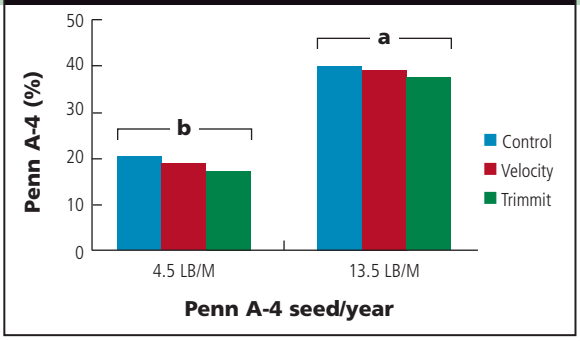
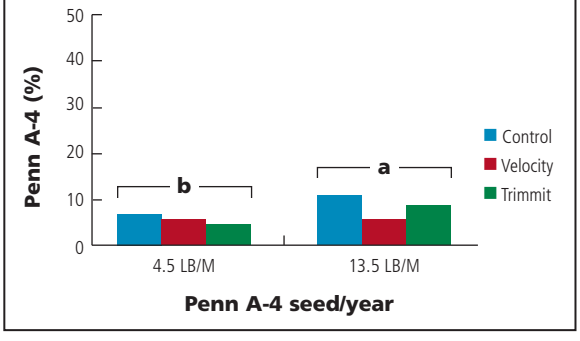


FIGURE 2: PENN A-4 POPULATIONS



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