Interseeding Improved Cultivars of Creeping Bentgrass into Existing Putting Greens

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Introduction

A myriad of recently released cultivars of creeping bentgrass with more desirable agronomic characteristics are available. Traditional conversion involving the use of non-selective herbicides or soil fumigants is costly and time consuming. Interseeding has been proposed as an alternative conversion method. Interseeding is a method of conversion where seed is sown into an established grass sward. The goal is for the introduced cultivar or species to become the major component of the sward over time.

A variety of factors influence the success of interseeding. Gap size has been found to influence the early success of seedlings. However, significant disruption to the canopy would reduce the uniformity of the playing surface and may not be desirable to golfers.

Factors such as germination speed and seed size have also been found to influence the success of seed sown into areas with established plants. In addition, research shows that seeding at above average rates has been advantageous when trying to establish turf cover when traffic is present.

The objectives of this study were to evaluate the ability of converting an established golf course putting green via interseeding.

Materials and Methods

An interseeding study was conducted on an established practice putting green at Hyperion Field Club in Johnston, IA in 2009 and 2010. Four replications arranged in a split block experimental design were used to evaluate three plant protectants (main plot) and two seeding regimes (subplot within main plot). Main plot treatments included a non-treated control, applications of Velocity herbicide, or Trimmit plant growth regulator. Sub plot treatments included seed sown into the canopy twice or nine times.

A Maredo seeder with vibratory spikes was used throughout the season to seed into the existing canopy at 1.5 lb/1,000ft^2 for seasonal totals of 4.5 or 13.5 lb/1,000ft^2. Velocity was applied every 14 days at 2 oz/acre starting June 4, 2010 and concluding July 16, 2010 for a total of four applications. A fifth and final application of Velocity was made October 1, 2010 at the same rate. Trimmit was applied every 14 days at 6 oz/acre starting June 4, 2010 and concluding September 10, 2010 for a total of eight applications.

Regular maintenance practices were only slightly altered as the goal was to preserve conditions that would be conducive for the play of golf. Irrigation via hand-watering was conducted during the summer months in order to provide moisture to promote germination. Regular maintenance included mowing, performed daily, to a height of 0.125 in. and overhead irrigation that was applied as necessary. Fertilizer (7N-7P-7K) was applied at a rate of 0.25 lb N/1,000 ft^2 each month of the growing season and diseases and insects were controlled as necessary.

Plant samples were collected during the fall of each year prior to snowfall and the following spring for evaluation of Penn A-4 populations. Cultivar identification was performed by using random amplified polymorphic DNA markers

that consistently amplified a 680 bp band in Penncross which was absent in Penn A-4.

Results and Discussion

Five months after initial seeding, the 4.5 and 13.5 lb/1,000 ft^2 seeding regimes resulted in a 19 and 39 percent conversion to Penn A-4, respectively (Figure 1). However, twelve months after initial seeding, Penn A-4 populations were reduced to 1 and 8 percent for the 4.5 and 13.5 lb/1,000 ft^2 seeding rate, respectively (Figure 2). These data indicate a transient shift to Penn A-4 occurred but was not able to persist. Additionally, applications of Velocity or Trimmit did not hasten conversion to Penn A-4 (Figures 1 and 2). The lack of establishment is likely due to competition from the surrounding turf and mechanical and environmental stresses. During the first year of the study, the percentage of annual bluegrass was reduced from approximately 60 to 20 percent in plots treated with Velocity (Figure 3). No loss of density occurred, but phytotoxicity was observed in plots treated with Velocity. Significant loss of density was observed during the second year of the study from Velocity applications. Our results indicate that converting an established putting green to Penn A-4 via interseeding was not successful in our study. Additionally, Velocity herbicide seems to have the capability to remove annual bluegrass from established putting greens, but needs to be used with caution in order to avoid a loss in turf density.

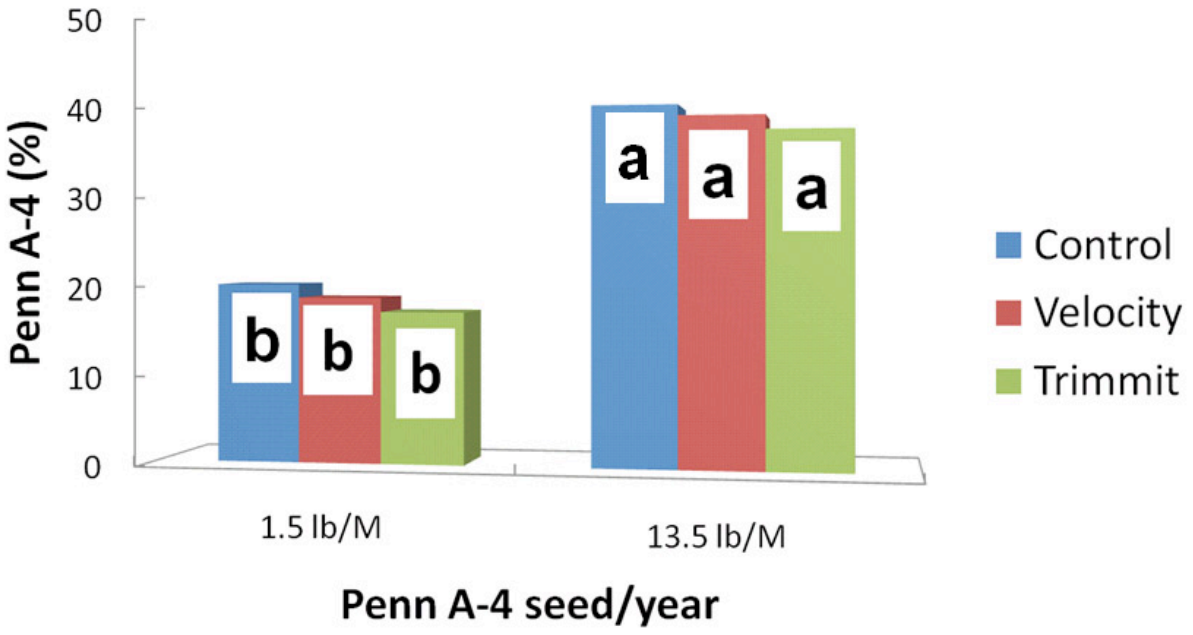

Figure 1. Percentage conversion of an established putting green to Penn A-4, five months after initial seeding. Values within seeding regimes followed by the same letter are not different at P = .05

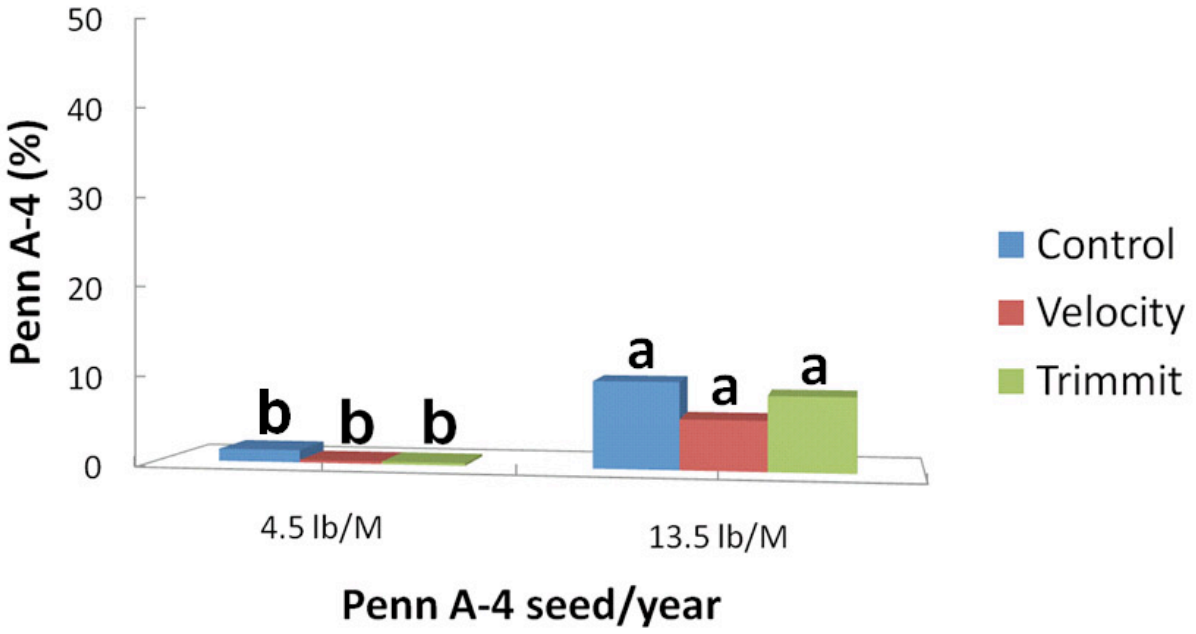

Figure 2. Percentage conversion of an established putting green to Penn A-4, 12 months after initial seeding. Values within seeding regimes followed by the same letter are not different at P = .05

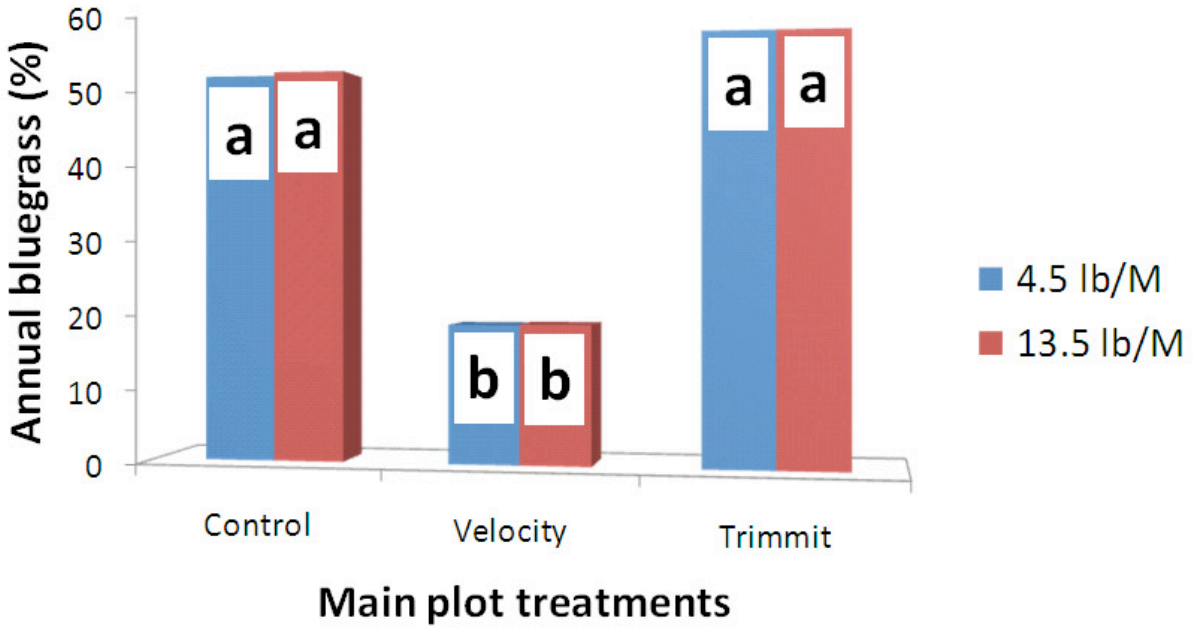

Figure 3. Percentage control of annual bluegrass for three main plot treatments and two sub plot treatments. Values within main plot treatments followed by the same letter are not different at P = .05.