Conversion of Established Putting Greens via Interseeding

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Objectives

The objectives of this research were to determine the effect of propagule pressure, velocity herbicide, and trimmit plant growth regulator on the conversion of an established golf course putting green to 'Penn A-4' creeping bentgrass (*Agrostis stolonifera* L.). Results of this research will help determine the effectiveness of interseeding as an alternative renovation method.

Rationale for research

We believe that fully 90 percent of our 420 Iowa Golf Courses have putting greens with 'older' varieties of creeping bentgrass and that many of those courses also have varying amounts of *Poa annua* as a component of their putting greens. New varieties of creeping bentgrass exist that offer improved agronomic characteristics and are better able to resist invasion from annual bluegrass. However, there are currently no methods for converting established putting greens to new varieties without taking the area out of play resulting in serious economic losses for the facility. It is our belief that interseeding could be used as a possible conversion method for established putting greens.

Findings and Discussion

One of my interseeding studies is located on a practice putting green at Hyperion Field Club. Below are the details of the study and why I think this project has a chance to be successful.

Presence of *Poa annua* –The practice green where the study is located has between 50-60% *poa.* So why would this help the interseeding process? The success of establishing new seedlings in existing turf is closely tied to plant competition. Trying to establish a cool-season species in established cool-season turf is difficult because they both share the same growth cycle. This is also the reason why overseeding in the southern U.S. is so successful. Cool-season grasses seeded into warm-season turf works quite well because they have different growth cycles. In our situation, even though *poa* is a cool-season species it is a winter annual. Winter annuals germinate in the fall persist through the winter and spring before ending their lifecycle during the summer months.

Products that harm *Poa annua* – There are perennial-type *poa's* as well, but they are generally more susceptible to summer stresses compared to creeping bentgrass. Our study is utilizing Velocity and Trimmitt, both products that harm *poa* more than bentgrass. Velocity applications started June 4 and were applied at 2 oz/A every 14 days for a total of 4 applications. Trimmitt applications also started June 4 and are being applied at 6 oz/A every 14 days. A total of 8 applications of Trimmitt will be made.

Establishing a creeping bentgrass seedbank – There are many plants that have been classified as "invasive" species. A shared trait of these plants is their ability to produce large volumes of seed and establish a seed bank. This is one reason why *poa* is so successful at colonizing established putting greens. I am borrowing this concept and attempting to establish a seedbank of creeping bentgrass. Bentgrass seed is being spiked into the green every 14 days at a rate of 1.5 lbs/1000 ft^2.

Accurate, non-disruptive spiker/seeder – The attraction of converting through interseeding is that play can continue during the conversion and revenue is not lost. Therefore, the process of placing the seed into the putting green must be non-disruptive. I'm using a walk-behind Maredo spiker/seeder to seed into the putting green. The company that manufactures this machine also makes floating heads that mount on a triplex unit. This machine accurately meters creeping bentgrass seed into many small holes. There is minimal disruption and play can follow directly behind the machine.

Image 1. Treatments include an untreated control and applications of Velocity herbicide and Trimmit plant growth regulator.

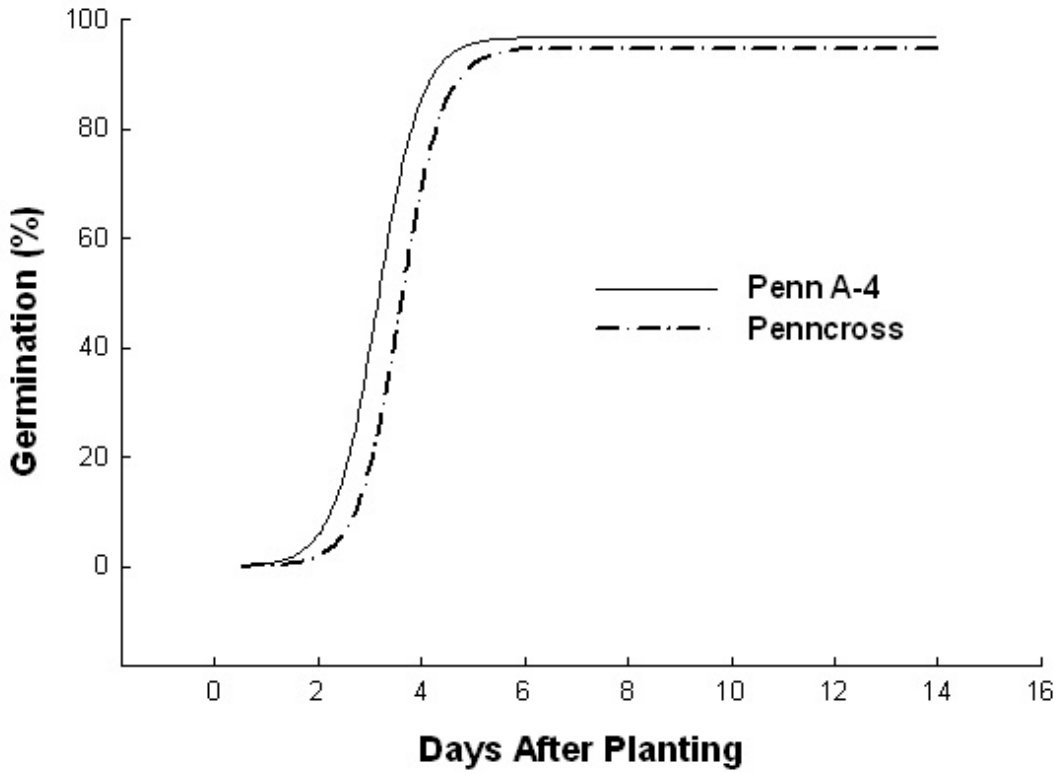

Figure 1. The results from our germination study show that 'Penn A-4' has superior germination characteristics compared with 'Penncross'. While these differences appear small, this study was conducted under optimum conditions and the discrepancy between the two cultivars would likely be greater under field conditions.

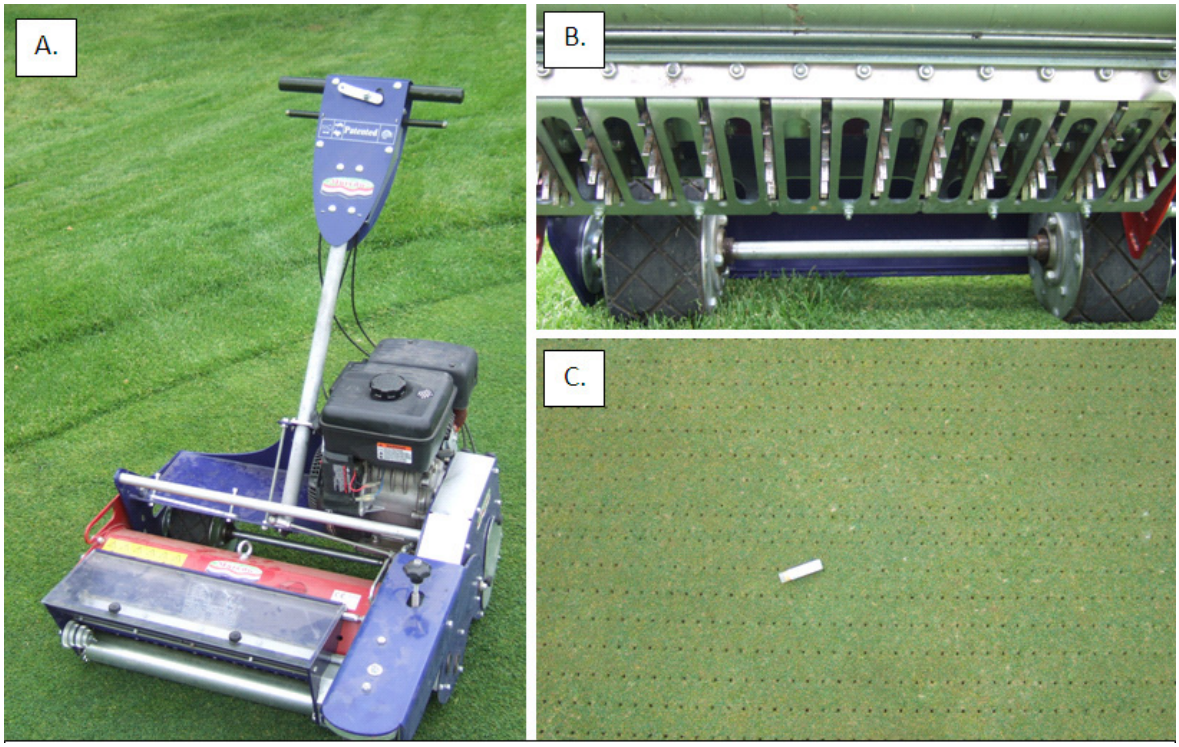

Image 2. A Maredo spiker/seeder (A) is used to sow seed into the putting surface. The machine uses a series of small spikes (B) to create a number of holes in the turf canopy. The minimal disruption created by the Maredo allows play to continue without stoppage.

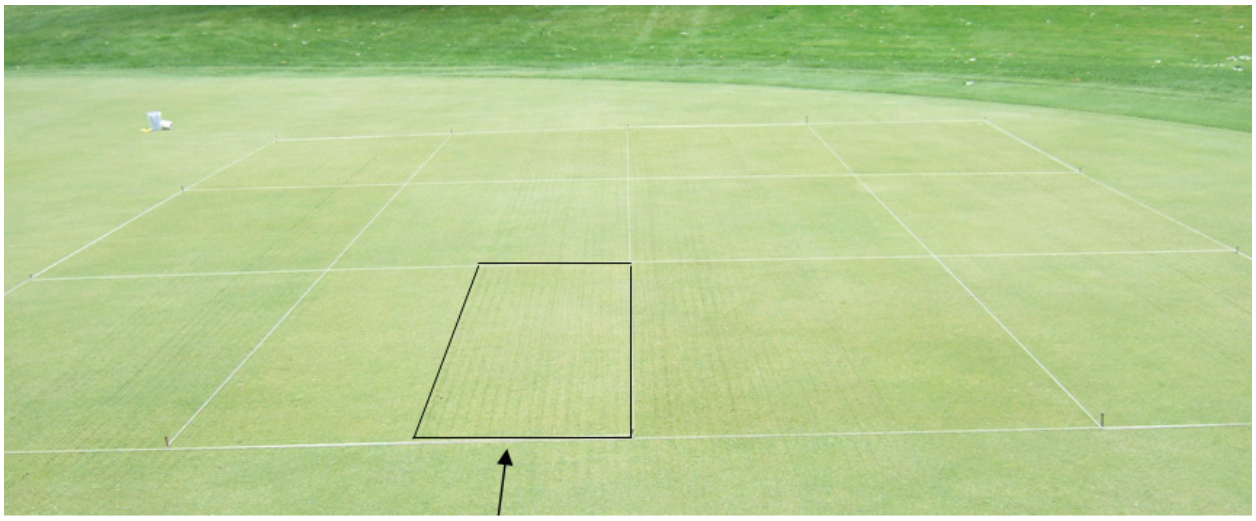

Image 3. Seed is spiked into half of each plot every 14 days at 1.5 lbs/1000 ft^2. The interseeded rows can be seen emerging through the existing canopy.

Image 4. Rows interseeded with 'Penn A-4' began to converge later in the season forming bands of new turf. Random amplified polymorphic DNA (RAPD) markers will be used to distinguish cultivars.