

OTRF FINAL REPORT

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Project: THE EFFECTS OF PERENNIAL RYEGRASS OVERSEEDING ON WEED SUPPRESSION AND SWARD COMPOSITION

Research Project and Results

In 2005 several field trials were implemented to assess the efficacy of perennial ryegrass overseeding into Kentucky bluegrass athletic fields for weed suppression. The goal of the research was to determine optimal application rates and timings for overseeding as a part of an integrated pest management (IPM) program. Seed for the overseeding experiments was generously donated by Pickseed Canada Inc.

Initial funding provided by the Ontario Turfgrass Research Foundation (OTRF) led to the acquisition of federal funding from the Natural Sciences and Engineering Research Council of Canada (NSERC). The outcome of this combined funding resulted in the establishment of two trials, one irrigated and one non-irrigated, at the Guelph Turfgrass Institute (GTI). Overseeding treatments included three rates of overseeding (2, 4, 8 kg/100m²) at seven application times (May, July, September, May+July, May+September, July+September, May+July+September). These trials were replicated four times and included 21 overseeding treatments, a weedy control, a spot spray, and a conventional spray. Weed populations were assessed in each plot using a randomized point quadrat in May of 2005 before any treatments were applied. Successive weed counts were completed in June, August and October in both 2005 and 2006. Turfgrass species populations were also recorded using the point quadrat method.

Collaboration between the OTRF and the Town of Oakville led to the implementation of three trials directly on athletic fields in the Town of Oakville. Weed populations were assessed in the same way as those at the GTI. Four specific overseeding treatments were chosen to apply to the plots plus a weedy control. These treatments included a single overseeding in May at a rate of 8 kg/100m² as well as overseeding applications in May+September at 2, 4, and 8 kg/100m². The two non-irrigated sites, Hopedale and Westbrook, comprised six replicates and four replicates on each field respectively whereas Shell Park was an irrigated field and had three replicates of the experiment. Two non-irrigated trials on athletic fields located at the University of Guelph were also implemented in the 2005 growing season with the same treatments as the Town of Oakville sites.

Analysis of the data from GTI and the in-use fields found that overseeding in July+September and May+July+September at the higher rates of 4 and 8 kg/100m² significantly decreased weed cover in the second year (2006) on irrigated plots when weed pressure was high. Similarly, overseeding in May+July+September at 4 and 8 kg/100m² significantly decreased weed cover in the second year (2006) on non-irrigated plots when weed pressure was high. After evaluation of these results, overseeding recommendations should consist of applying seed at multiple intervals over the growing season to obtain the best results for weed suppression.

Perennial ryegrass populations increased in stands that were originally pure Kentucky bluegrass; however, on the in-use fields in Oakville and at the University of Guelph where there was a history of overseeding and wear occurring on a regular basis, no significant increases in populations were noted. In addition, at the conclusion of the

experiment in October 2006, no differences in establishment were found between the three rates of overseeding and therefore research of the long-term effects of overseeding on weed cover at low rates is merited.

Results from this short-term cultural weed control experiment are encouraging and justify overseeding budgets for municipalities which have a municipal by-law restricting herbicide application or simply wish to implement an IPM program on their athletic fields and recreational parks.

Outcomes

Highly Qualified Persons

Evan Elford successfully defended his M.Sc. and his degree will conferred in June 2007.

Extension presentations:

- Ontario Turfgrass Symposium, Guelph, ON.....2006, 2007
- Sports Turfgrass Managers Association, San Antonio, TX.....2007
- Sports Turf Association Field Day St. Catherine's ON.....2006
- City of Ottawa Turfgrass Worker Education.....2006, 2007
- Healthy Lawns Seminars (3) Guelph, ON.....2007

Extension publications:

Elford, Evan, Competitive turf: overseeding for weed management, 2006, Spring, 19:1:15

Scientific Presentations:

Effects Of Timing And Rate Of Perennial Ryegrass (*Lolium perenne* L.) Overseeding On Weed Suppression In Established Turfgrass. Evan M. A. Elford, Darren E. Robinson, François J. Tardif, and Eric M. Lyons Department of Plant Agriculture, University of Guelph, Guelph, ON, N1G 2W1, Canada. Canadian Weed Science Society Annual Meeting, 2006 Victoria, B.C.

Effects of Perennial Ryegrass (*Lolium perenne* L.) Overseeding into Kentucky Bluegrass (*Poa pratensis* L.) Athletic Turf for Weed Suppression. E. M. A. Elford*, F. J. Tardif, E. M. Lyons; Plant Agriculture, University of Guelph, Guelph, ON, Canada. Weed Science Society of America Annual Meeting, 2007 San Antonio TX

Scientific Publications

M.Sc Thesis: "The effects of perennial ryegrass overseeding on weed suppression and sward composition"

Manuscript in preparation to be submitted to Weed Technology