

Multiple Autumn Applications of Mesotrione and Mesotrione plus Ethofumesate for Selective Post-emergence *Poa annua* L. Suppression in *Poa pratensis* L. Fairways



C.T. Golob and W.J. Johnston
Washington State University, USA



Introduction

Annual bluegrass (*Poa annua* L.) invasion, especially in fairways that are planted to dark green Kentucky bluegrass (*Poa pratensis* L.) cultivars, is often aesthetically unpleasing (Riggs, 2010). The lighter green color of *P. annua* contrasts with the darker green color of *P. pratensis* and gives fairways a mottled look (Reicher and Throssell, 1998). In addition, there are greater challenges to maintain these stands at desirable playing conditions (Riggs, 2010; Reicher and Throssell, 1998). Beginning in 2009, a 2-year study was conducted at Pullman, WA to determine the efficacy of mesotrione ('Tenacity') applied alone or combined with a grass weed herbicide, ethofumesate ('Prograss'), in the Autumn, for post-emergence control of *P. annua* in a *P. pratensis* fairway.

Materials and Methods

The study was conducted on a fairway at Palouse Ridge Golf Club (PRGC) that was initially, Autumn 2009, 55% *P. pratensis* and 45% *P. annua*. Treatments were applied at 234 L ha⁻¹ three times each Autumn on 22 Sept., 7 Oct., and 19 Oct. 2009 and 16 Sept., 4 Oct., and 18 Oct. 2010 with a bicycle-wheeled CO₂ pressurized sprayer using 11002 flat fan spray nozzles at 276 kPa. At each date, mesotrione was applied at 173 g a.i. ha⁻¹, ethofumesate at 414 g a.i. ha⁻¹, or mesotrione at 173 g a.i. ha⁻¹ + ethofumesate at 414 g a.i. ha⁻¹. Additionally, a nonionic surfactant ('Activator 90') was added at 0.25 % v/v with treatments that contained mesotrione. The percentage of *P. annua* within each plot was determined at various times throughout the following two growing seasons. Percentage change of *P. annua* was determined by dividing the percent *P. annua* in the stand at each rating date by the initial percentage. Turfgrass quality (2011 only) was rated from 1 to 9; 9 = excellent. The experimental design was a randomized complete block with three replications. Standard errors were calculated for each mean at each rating date.

Results and Discussion

Mesotrione at 173 g a.i. ha⁻¹ + ethofumesate at 414 g a.i. ha⁻¹ reduced *P. annua* greater in the turfgrass stand, compared to the other treatments, over the 2 years of the study (Fig. 1). Reduction in *P. annua* during the first year was ≤84% and the second year 93%. Mesotrione at 173 g a.i. ha⁻¹ reduced *P. annua* by ≤71 % the second year. Overall, by the end of the study, the mesotrione + ethofumesate treatment reduced *P. annua* in the stand by 65%. Mesotrione at 173 g a.i. ha⁻¹ resulted in approximately a 10% reduction of *P. annua*. The check and ethofumesate at 414 g a.i. ha⁻¹ each resulted in a >75% increase in *P. annua*. At the end of each Summer, the percentage of *P. annua* increased regardless of treatment.

The mesotrione + ethofumesate treatment, which had the greatest reduction in *P. annua* in the stand also had the highest turfgrass quality during the Summer 2011 (Fig. 2). With this reduction in *P. annua* there was a greater percentage of *P. pratensis* in the stand, which resulted in higher turfgrass quality (Fig. 3).

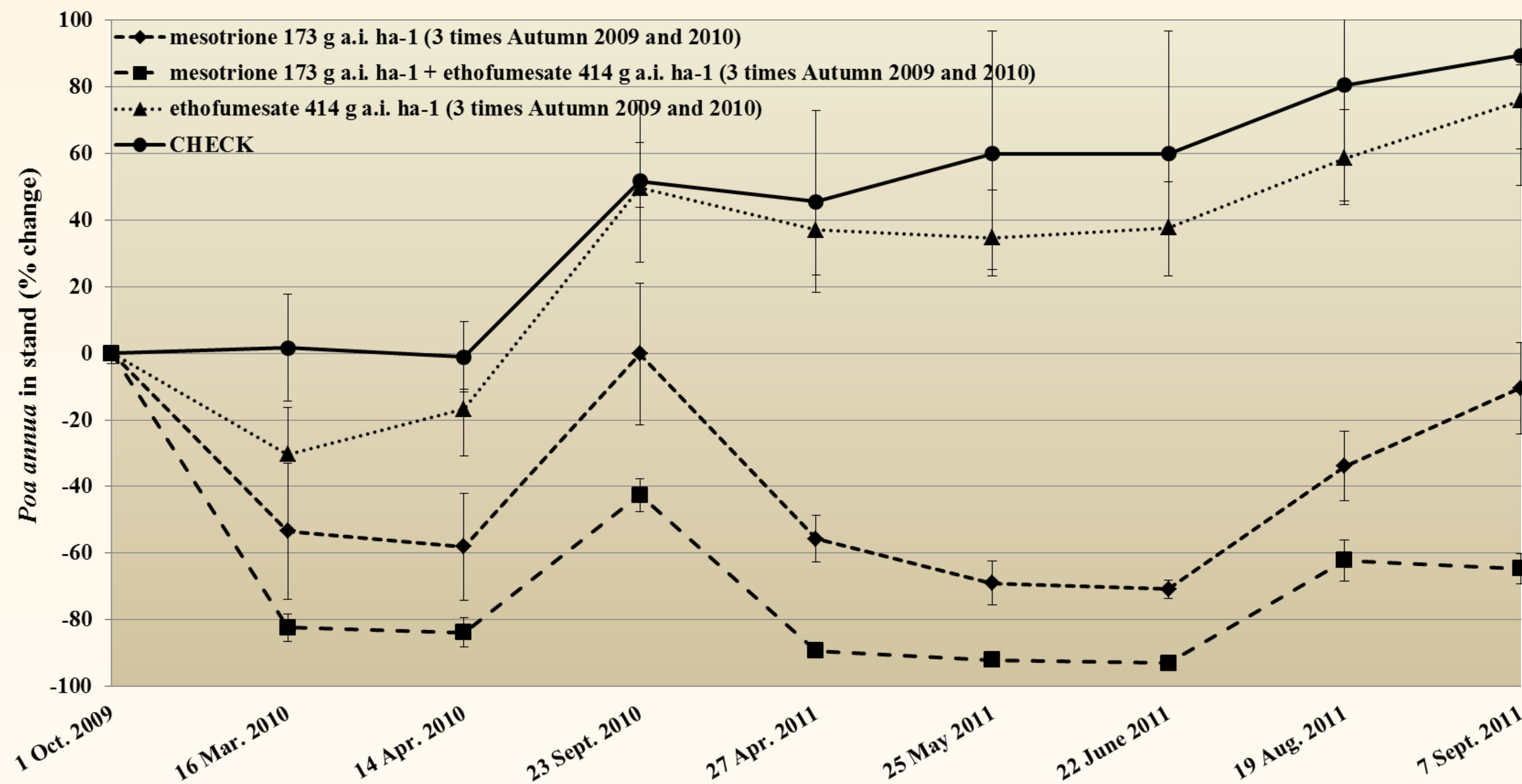


Fig. 1. Percentage change in *P. annua* in a *P. pratensis* fairway over two years of multiple Autumn herbicide applications at Pullman, WA.

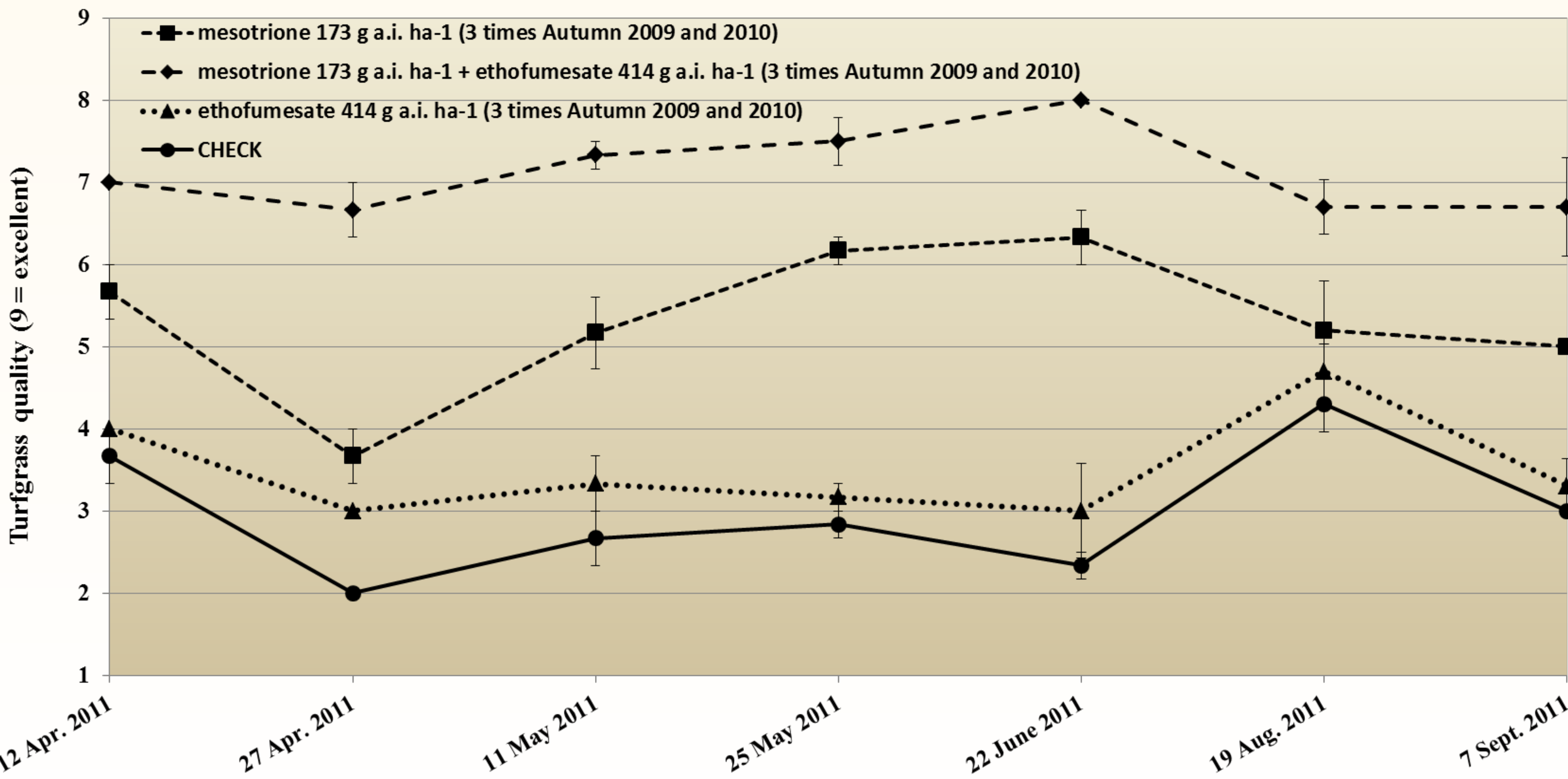


Fig. 2. Turfgrass quality of a *P. pratensis* fairway after two years of multiple Autumn herbicide applications at Pullman, WA.

Conclusions

Overall, mesotrione at 173 g a.i. ha⁻¹ + ethofumesate at 414 g a.i. ha⁻¹, over two consecutive years of multiple Autumn applications reduced *P. annua* (>65%) and had the highest overall turfgrass quality of all treatments. Since complete *P. annua* control was not achieved, it appears that continual Autumn applications of mesotrione at 173 g a.i. ha⁻¹ + ethofumesate at 414 g a.i. ha⁻¹ will most likely be necessary to maintain low levels of *P. annua* in *P. pratensis* fairways.

Literature cited

Reicher, Z. and Throssell, C. 1998. Control of *Poa annua* and *Poa trivialis* in lawns. Purdue Turfgrass Science Program. <http://agry.purdue.edu/turf/pubs/agry9802.htm>.
Riggs, N. Dec. 2010. Two new *Poa annua* control tools. Superintendent Magazine. <http://www.superintendentmagazine.com/article-6425.aspx>.



Fig. 3. Mesotrione + ethofumesate treatment after two years of multiple Autumn herbicide applications at Pullman, WA.