

Evaluation of Plant Growth Regulators (PGRs) for *Poa annua* Reduction in an *Agrostis stolonifera* Fairway

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Abstract

Poa annua is a common weed found on golf course fairways, tees, and greens. There are currently no truly effective, selective controls for this species in creeping bentgrass (*Agrostis stolonifera*) turf. An approach that has met with some success is to reduce *Poa annua* infestations through the application of gibberellic acid (GA) inhibiting plant growth regulators. These PGRs slow the growth of *Poa annua* more than the creeping bentgrass, giving creeping bentgrass a competitive advantage that slowly increases its population. We compared an experimental GA inhibiting material, EXP-TGN4549, to the industry standards, paclobutrazol, trinexapac-ethyl, and flurprimidol on a creeping bentgrass/*Poa annua* golf course fairway. Trinexapac-ethyl did not reduce *Poa annua* plant counts during the season. The flurprimidol and paclobutrazol at label rates both reduced *Poa annua* plant counts by approximately 50%. The EXP-TGN4549 at the 0.56 kg/ha rate reduced *Poa annua* populations to the same extent as the flurprimidol and the paclobutrazol.

Background

This research project was initiated in the spring of 2006. The objective of the 2006 study was to measure the growth regulating capability of EXP-TGN4549. Secondly, observations of any reductions in *Poa annua* were also recorded. The research was then continued in a new field study in the spring of 2007 to observe phytotoxicity on creeping bentgrass and *Poa annua* reduction.

Methods

Research plots were located at Veenker Memorial Golf Course in Ames, Iowa. The 2006 study was located on the 15th fairway, which was a 'Southshore' creeping bentgrass and *Poa annua* mix. The 2007 study was located around the practice green. The green and collar area was originally established to 'Penncross' creeping bentgrass and was maintained by the grounds crew. The research plots were treated every four weeks at varying rates, the actual dates were; June 9, July 14, August 11, September 8, and October 9, 2006 (Table 1). Phytotoxicity levels were taken visually and *Poa annua* counts were taken using a 0.84 m² grid periodically throughout the research. A 9 to 1 scale was used for the phytotoxicity ratings, where 9 represented no damage, 6 represented acceptable turf, and 1 indicated dead turf. In the 2007 study, treatments were applied every four weeks. Data were collected on phytotoxicity and *Poa annua* reduction in the 2007 study.

Results

The 2006 EXP-TGN4549 study concluded that this experimental compound is effective at regulating the growth of creeping bentgrass for two to three weeks, with repeat application intervals of three weeks to provide continued growth regulation. There was a rate response in growth reduction with increasing levels of EXP-TGN4549 during the 2006 season (Figure 1). The study also showed that EXP-TGN4549 did not cause phytotoxicity in excess of the comparable GA inhibiting compounds. The flurprimidol and paclobutrazol at label rates both reduced *Poa annua* plant counts by approximately 50%. The EXP-TGN4549 at the 0.56 kg/ha rate reduced *Poa annua* populations to the same extent as the flurprimidol and the paclobutrazol (Figure 2). The 2007 study showed no statistically significant differences in phytotoxicity or in *Poa annua* reduction. A final count of the *Poa annua* will be taken in the spring of 2008, when seedheads develop.

Table 1. Treatments in the 2006 EXP-TGN4549 study

Treatment	Product	Rate (kg/ha)	Application Interval
1	EXP-TGN4549	0.105	4 weeks
2	EXP-TGN4549	0.14	4 weeks
3	EXP-TGN4549	0.28	4 weeks
4	EXP-TGN4549	0.56	4 weeks
5	Trinexapac-ethyl (6011)	0.096	4 weeks
6	Paclobutrazol (6012)	0.28	4 weeks
7	Flurprimidol (6013)	0.28	4 weeks
8	Control	--	--

Treatment dates were June 9, July 14, August 11, September 8, and October 9, 2006

Figure 1. 2006 percentage clipping reduction of 'Southshore' creeping bentgrass/*Poa annua* from EXP-TGN4549 treatments

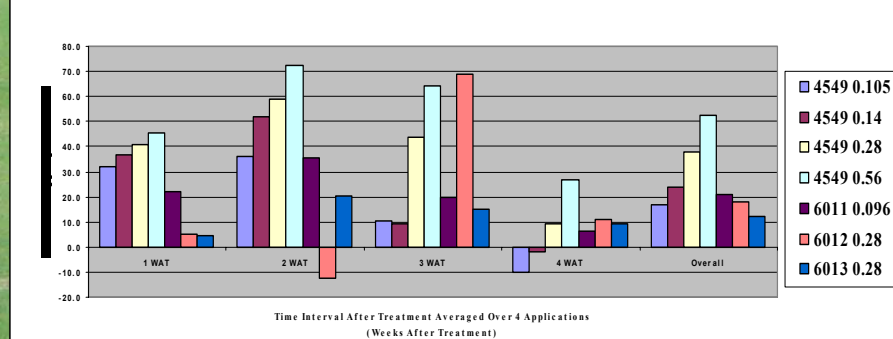
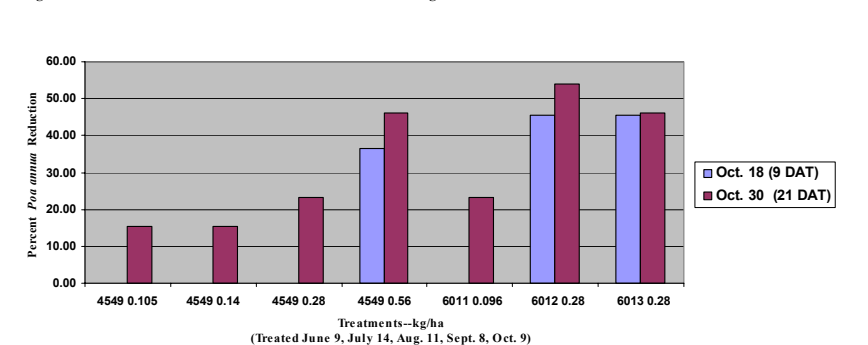


Figure 2. 2006 Percent *Poa annua* reduction in 'Southshore' bentgrass from EXP-TGN4549 treatments



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