Mesotrione Reduces Presence of Annual Bluegrass During Fairway Conversion

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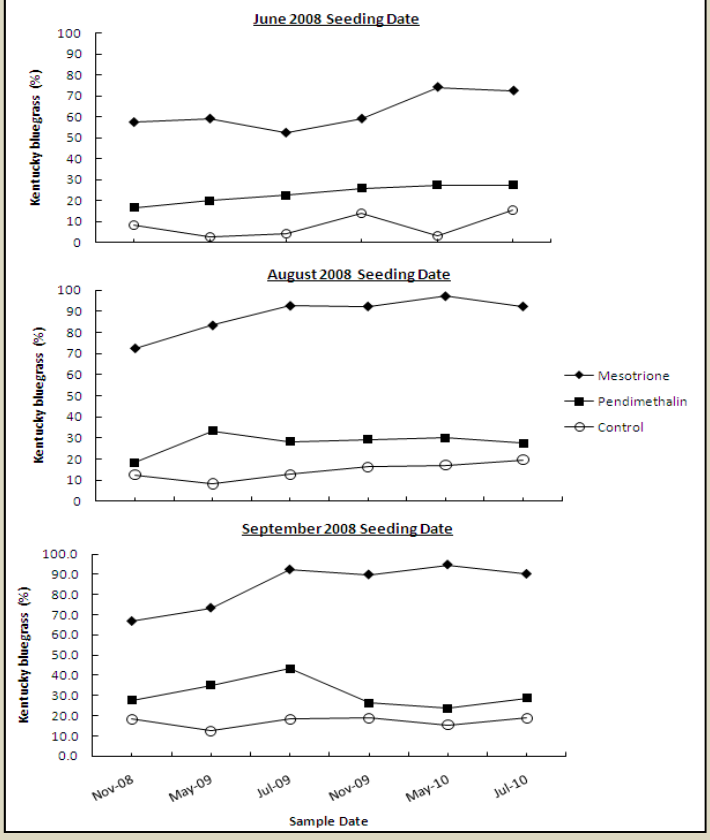
Introduction

Annual bluegrass (*Poa annua* L.) is the most troublesome, invasive weed in cool-season turfgrasses, and its impact has been felt worldwide in the turfgrass industry (Beard, 1970; Poole et al., 2005). Annual bluegrass is troublesome for golf course superintendents due to its unsightly color, ability to tolerate low mowing heights, and poor heat, drought, and disease tolerance. These factors lead to increased irrigation, fertilization, and fungicide applications to maintain acceptable turf quality (Rossi, 2001; Shem-Tov and Fennimore, 2003; McCullough and Hart, 2008). Many research programs have focused on controlling annual bluegrass (Gaussoin and Branham, 1987; Rossi, 2001; Lycan et al., 2005; Hart and McCullough, 2007), and many herbicides have shown promise only to discover that annual bluegrass returns to treated areas after treatments cease (Rossi, 2001). The density of the annual bluegrass seed bank is thought to cause reinfestation (Shem-Tov and Fennimore, 2003). Strategies combining rapid establishment of Kentucky bluegrass with effective control of annual bluegrass during fairway conversion must be developed to ensure a high quality playing surface.

The objectives of our study were:

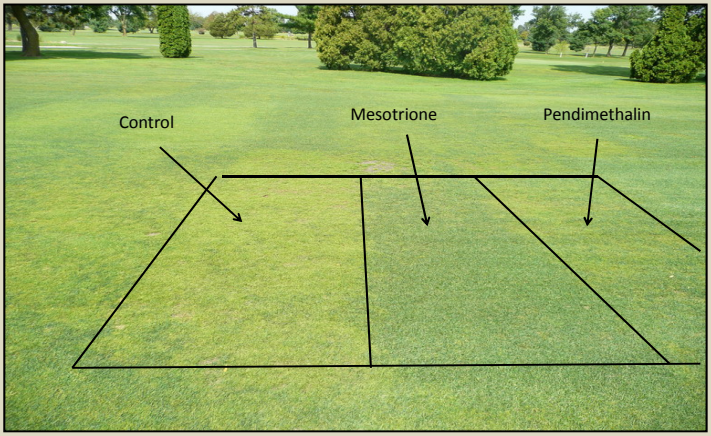
1) To evaluate the effectiveness of two herbicides, mesotrione and pendimethalin, in reducing the presence of annual bluegrass during fairway conversion to Kentucky bluegrass,
2) To determine the best month to perform fairway conversion, and
3) To determine if doubling the normal seeding rate increased Kentucky bluegrass cover.

Figure 1. Percentage cover of Kentucky bluegrass averaged over two years on two courses, treated with mesotrione, pendimethalin, and a non treated control. Each figure represents one of three seeding months, June, August, or September 2008.



Materials & Methods

- Two separate studies were conducted over four years at three different golf courses in Iowa. The 2007-2008 study was conducted at Homewood Golf Course in Ames, IA and Twin Pines Golf Course in Cedar Rapids, IA. The 2008-2009 study was conducted at Twin Pines Golf Course in Cedar Rapids, IA and Jewell, IA.
- Three seeding months (June, August, and September) and two seeding rates (15 and 30 g m^{-2}) were evaluated with the following low mowing tolerant varieties of Kentucky bluegrass: 'Absolute', 'Everglade', 'Liberator', 'NuDestiny', and 'Total Eclipse'.
- Pendimethalin was applied at 1.68 kg ha^{-1} in three applications on 15 Oct, 15 Nov, and 15 Apr while mesotrione was applied at 0.19 kg ha^{-1} on 10, 20, and 30 Oct. These spraying schedules and amounts were applied during the establishment year and the following year. Both treatments were applied with a 0.25% v/v non-ionic surfactant.
- Visual estimates of percentage Kentucky bluegrass, annual bluegrass, and bare soil were made in Nov of the establishment year, May, Jul, and Nov of the following year and May and July of the year after treatments ended.
- All other fertility, fungicide treatments, and irrigation were in accordance with the respective golf course superintendent's fairway management program



Conclusions

- The highest percentage cover of Kentucky bluegrass occurred when seeded in August or September and treated with three sequential applications of mesotrione in October during the establishment year and the year following establishment.
- Increasing the seed rate had no effect on the final percentage cover of Kentucky bluegrass.
- Mesotrione reduced the presence of annual bluegrass more effectively than pendimethalin.
- No phytotoxicity was observed on kentucky bluegrass seedlings as a result of mesotrione application.
- By the end of the study, plots seeded in August or September and treated with mesotrione contained greater than 90% Kentucky bluegrass cover.