Public Abstract
First Name:Kenton
Middle Name:Matthew
Last Name:Binkholder
Adviser's First Name:Reid
Adviser's Last Name:Smeda
Co-Adviser's First Name:
Co-Adviser's Last Name:
Graduation Term:FS 2010
Department:Plant, Insect and Microbial Sciences
Degree:MS
Title:IDENTIFICATION AND MANAGEMENT OF GLYPHOSATE-RESISTANT ANNUAL BLUEGRASS (*Poa annua* L.)

Annual bluegrass is a winter annual weed and is problematic on golf courses in the Transition Zone and Southern United States. Superintendents have applied glyphosate on dormant zoysiagrass to remove winter annual weeds. In 2007, a population of annual bluegrass in Columbia, Missouri (hereafter referred to as CCMO1) was not controlled with glyphosate following more than 10 years of continuous use. Research was conducted to determine if population of annual bluegrass in Columbia, Missouri is glyphosate-resistant, to evaluate alternative control strategies utilizing pre-emergence (PRE) and post-emergence (POST) herbicides in zoysiagrass, and to determine the impact of glyphosate on annual bluegrass reproduction. Research results indicated that CCMO1 survived application rates of 6.3 kg ae ha-1 where susceptible biotypes were controlled at 0.78 kg ha-1. These data resulted in an R:S ratio of 5.2. Alternative management resulted in 90% control of annual bluegrass in spring with fall applied PREs and no injury or delay of greenup was observed. POST herbicides resulted in ALS inhibitors resulting in >95% control of annual bluegrass and no injury, while glyphosate resulted in 58% control and 25% injury of zoysiagrass. Optimum management of glyphosate-resistant annual bluegrass is best with fall applied PRE and a spring follow-up with a POST if necessary. Impact of glyphosate on annual bluegrass reproduction resulted in 15,000 to 16,000 and 21,000 to 30,000 seeds produced for untreated S and CCMO1 plants, respectively. In addition, viability of CCMO1 seeds was 1.2-fold higher than S; resulting in no apparent lack of reproductive fitness associated with glyphosate-resistance. When treated at flowering S plants resulted in 1.5 viable seeds per plant, whereas CCMO1 plants resulted in 2.4 viable seeds per plant for I80 rate at flowering. Continued use of glyphosate to manage a resistant population of annual bluegrass is not advised, as plants exhibit the potential to increase viable seeds in soil seed-bank.