EVALUATION OF WIDESTRIKE COTTON INJURY FROM EARLY SEASON HERBICIDE X INSECTICIDE TANK MIXES

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Abstract

This study was conducted in 2010 at the West Tennessee Research and Education Center in Jackson, TN. The objective of this research was to evaluate the tolerance of Phytogen® 375 WRF (WideStrike®) cotton to Ignite® or Sequence® alone or when tank mixed with various insecticides in the presence of thrips. There were significant differences in visual injury between herbicides and also between insecticides. Ignite delayed crop maturity. Total yield was reduced by application of Ignite ($P = 0.0007$) but not by insecticide treatment ($P = 0.1969$). There was no interaction between herbicide and insecticide on total yield ($P = 0.7009$). These data show that maturity can be delayed and yield decreased by an early season Ignite or Ignite + insecticide application to WideStrike cotton that is already stressed by thrips.

Introduction

Glyphosate-resistant (GR) Palmer amaranth, also known as Palmer pigweed, is dramatically changing the way Tennessee cotton producers must manage their crop. Prior to the appearance of GR pigweed, growers would often apply glyphosate and s-metolachlor, typically in the form of Sequence. GR pigweed is forcing producers to try alternative weed control measures. One method is the use of the broadcast application of Ignite (glufosinate) to WideStrike cotton varieties. WideStrike cotton varieties have tolerance to Ignite and were planted on 63% of Tennessee cotton acres in 2010. Ignite is efficacious in controlling Palmer pigweed.

Applications of Ignite on WideStrike cotton can cause crop injury, primary in the form of leaf burn. This injury has rarely been shown to cause yield loss. However, early applications of Ignite may often be co-applied with insecticides for thrips control. These include products such as dimethoate, acephate or dicrotophos (Bidrin®). The effect of insecticides tank mixed with Ignite is unknown, but they could potentially worsen the injurious effects of herbicides.

Materials and Methods

The trial was conducted at the West Tennessee Research and Education Center in Jackson, TN to assess the tolerance of Phytogen® 375 WRF (WideStrike) cotton to early season herbicide x insecticide tank mixes. Phytogen 375 WRF without Temik or an insecticide seed treatment was planted no-till on May 14, 2010. Individual plots were four rows (38 inch centers) x 30 feet. Treatments were replicated four times in a factorial design (herbicide x insecticide). All agronomic practices such as fertilization, seeding rates and control of non-target insects followed University of Tennessee recommendations.

Foliar treatments were applied June 1 to two-leaf cotton. Applications were made using a high-clearance sprayer calibrated to deliver 8 GPA at 40 PSI through TeeJet 80015 flat fan nozzles (2 per row). There was significant thrips injury to plants at the time of application. Visual crop injury was evaluated June 3 using a 0 – 100 scale with 0 = no injury and 100 = plant death. Yield data were collected on September 16 and October 1 by harvesting the center two rows of each plot. Data were subjected to Factorial ANOVA and means were separated using a protected LSD ($P < 0.05$).

Results and Discussion

Ignite caused 25% more visual injury compared with Sequence ($P = 0.0001$). Dimethoate caused 3 – 4% more visual injury compared with the other insecticides ($P = 0.0356$). All insecticide treatments similarly reduced immature thrips numbers and injury (data not shown).

Ignite delayed maturity compared with Sequence as evidenced by first and second harvest data (Figure 1). Ignite also decreased total seed cotton yield compared with Sequence (P = 0.0007, LSD = 299) (Table 1 and Figure 2). There was no significant interaction between herbicide and insecticide treatment on total yield (P = 0.7009).

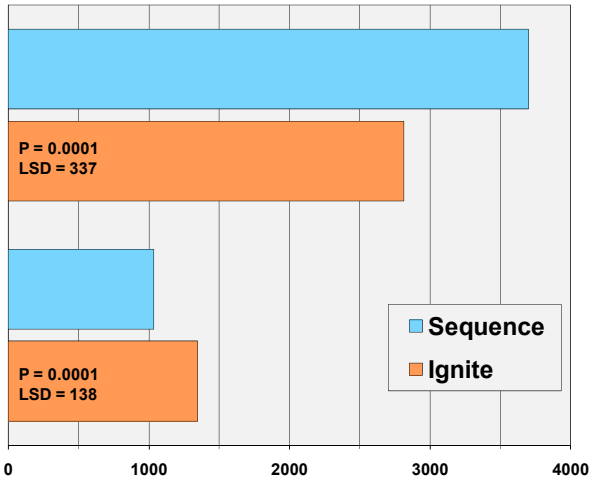


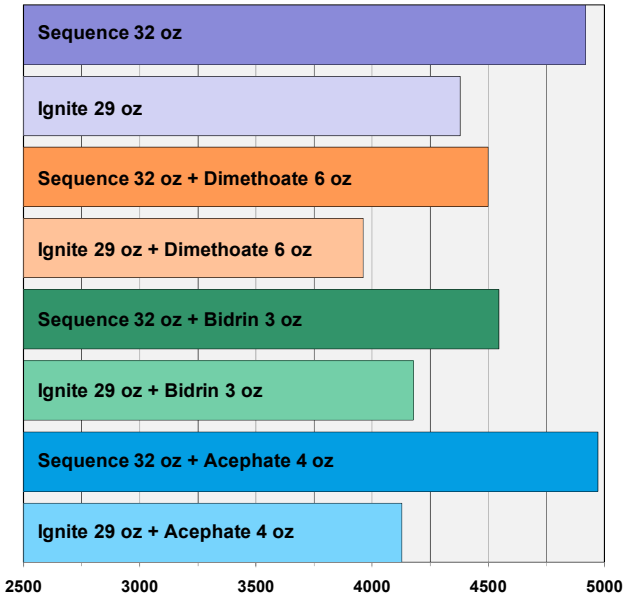
Figure 1. First Harvest, top, (P = 0.0001, LSD = 337) and Second Harvest, bottom, (P = 0.0001, LSD = 138) Seed Cotton (lbs/acre)

Table 1. Factor Analysis for Total Seed Cotton.

Factor	Treatment	Mean	
Herbicide (H)	Sequence	4733	(P = 0.0007, LSD = 299)
	Ignite	4161	
Insecticide (I)	Untreated	4648	(P = 0.1969, LSD = 423)
	Dimethoate	4230	
	Bidrin	4361	
	Acephate	4549	

H x I Interaction (P = 0.7009)

Figure 2. Total Seed Cotton (lbs/acre)



Summary

These data show that maturity can be delayed and yield decreased by an early season Ignite or Ignite + insecticide application to WideStrike cotton that is already stressed by thrips. Cotton producers must weigh this risk against potential yield loss from GR weeds.

Acknowledgements

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