

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

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### **Abstract**

This study was conducted in 2010 and 2011 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 in 2010, but not in 2011. Ignite delayed crop maturity in 2010 but did not delay maturity in 2011. Total yield was reduced by application of Ignite but not by insecticide treatment in 2010. Herbicide treatment did not affect yield in 2011 but insecticide application increased yield ( $P = 0.0165$ ). There was no interaction between herbicide and insecticide on total yield in 2010 or 2011. 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 and approximately 70% in 2011. Ignite is efficacious in controlling Palmer pigweed.

Applications of Ignite on WideStrike cotton can cause crop injury, primarily 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 and May 10, 2011. Individual plots were four rows (38 inch centers) x 30 feet. Treatments were replicated four times in a 2 (herbicide) x 3 (insecticide) factorial design. All agronomic practices such as fertilization, seeding rates and control of non-target insects followed University of Tennessee Extension recommendations.

Foliar treatments were applied June 1, 2010 and May 30, 2011 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 of both years using a 0 – 100 scale with 0 = no injury and 100 = plant death. Yield data were collected on September 16, October 1, 2010 and September 23, 2011 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 in 2010 ( $P < 0.0001$ ) but there were no differences in visual injury in 2011 ( $P = 0.2796$ ). Dimethoate caused 3 – 4% more visual injury compared with the other insecticides in 2010 ( $P = 0.0356$ ), but insecticide had no effect on leaf burn in 2011 ( $P = 0.8098$ ). All insecticide treatments similarly reduced immature thrips numbers and injury ( $P < 0.05$ , data not shown).

Compared with Sequence, Ignite delayed crop maturity in 2010, resulting in a greater percentage of the crop being harvested during the second picking (data not shown). However, there were no observed effects of herbicide treatment on crop maturity in 2011. In 2010, treatment with Ignite decreased total seed cotton yield compared with Sequence but not in 2011 (Table 1, Figs. 1 and 2). Insecticide treatment had no effect on total seed cotton yield in 2010, but Bidrin and acephate increased yield in 2011 (Table 1, Figs. 1 and 2). There was no significant interaction between herbicide and insecticide treatment on total yield in 2010 or 2011.

Table 1. Effects of herbicide and insecticide treatments on seed cotton weights in 2010 and 2011.

Main Effect	Treatment	Year 2010 (lbs/acre)	Year 2011 (lbs/acre)
Herbicide	Sequence	4733 a	3085 a
	Ignite	4160 b	3174 b
		$P = 0.0007, LSD = 299$	$P = 0.3496, LSD = 193$
Insecticide	Untreated	4648 a	2885 a
	Dimethoate	4230 a	3068 ab
	Bidrin	4361 a	3286 b
	Acephate	4549 a	3280 b
		$P = 0.1969, LSD = 423$	$P = 0.0165, LSD = 273$

Herbicide x insecticide interactions were not significant (2010:  $P = 0.7009$ ,  $LSD = 598$ ; 2011:  $P = 0.1456$ ,  $LSD = 387$ ).

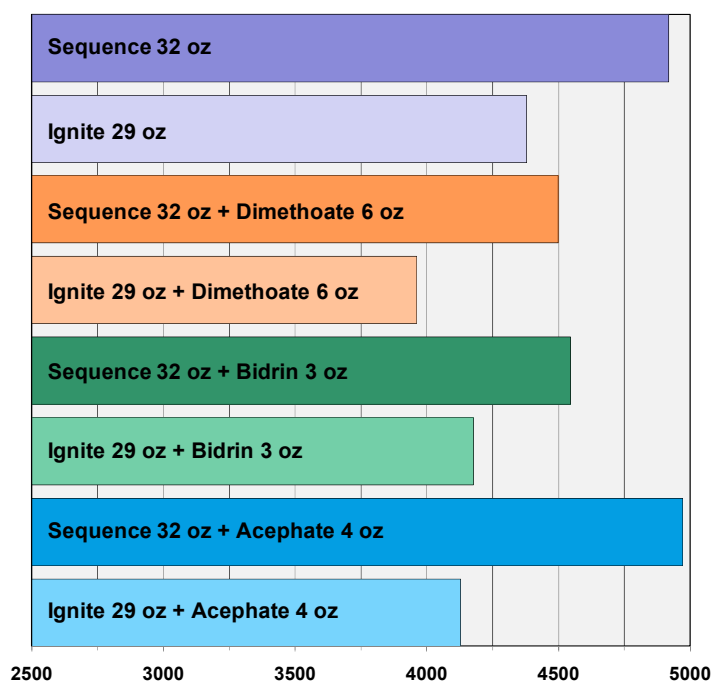


Figure 1. Total seed cotton (lbs/acre) in treatments of herbicide and insecticide tank mixes made to cotton at the second true leaf, 2010.

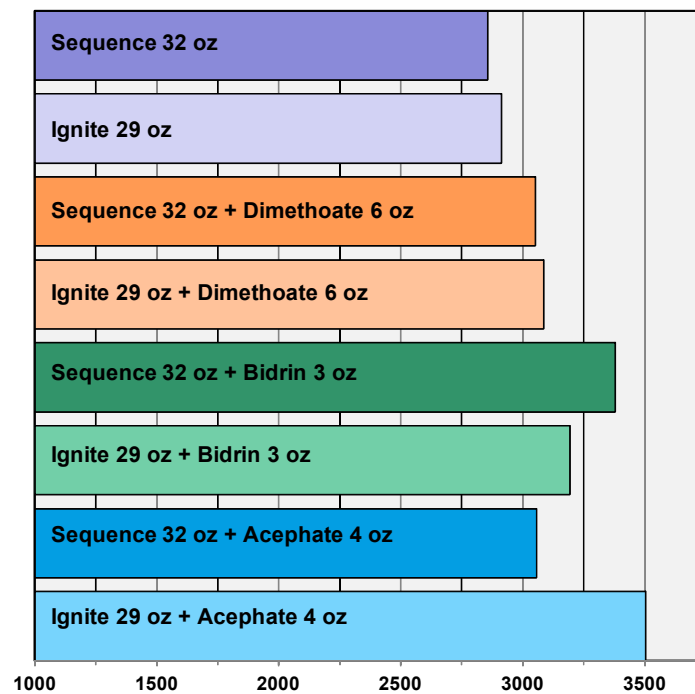


Figure 2. Total seed cotton (lbs/acre) in treatments of herbicide and insecticide tank mixes made to cotton at the second true leaf, 2010.

### 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

The authors wish to express their appreciation to Cotton Incorporated for their support of this research.