

Evaluation of WideStrike® Cotton Injury from Early Season Herbicide x Insecticide Tank Mixes

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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 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.



Seedling cotton injured by Ignite application.

Objective

The objective of this research was to evaluate the tolerance of PHY 375 WRF (WideStrike) cotton to Ignite or Sequence alone or when tank mixed with various insecticides in the presence of thrips.

Materials & Methods

- Planted: May 14, 2010, and May 10, 2011, No-till, 38-inch rows, West Tennessee Research and Education Center
- Variety: Phytogen 375 WRF without Temik® or insecticide seed treatment
- Design: Four replications in a factorial design (Herbicide x Insecticide)
- Plots: 4 rows X 30 feet
- Foliar treatments applied on June 1, 2010 and May 30, 2011 to two-leaf cotton (note: there was significant thrips injury to plants at the time of treatment application)
- Evaluation of visual crop injury: June 3 using a 0 – 100 scale, 0 = no injury, 100 = plant death
- Harvested: Sept 16 & Oct 1, 2010 and Sept 23, 2011, two center rows

Results

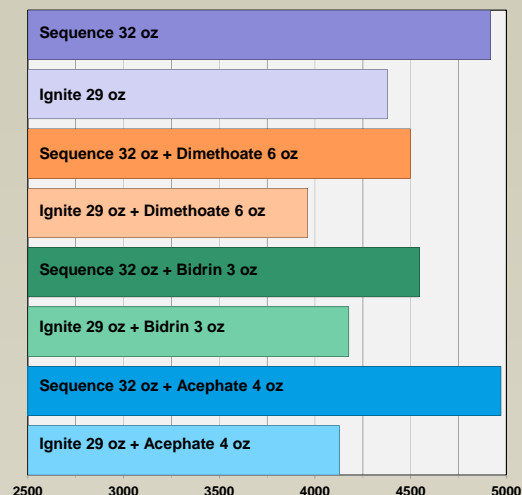
- Ignite caused 25% more visual injury, primarily as leaf burn, compared with Sequence ($P = 0.0001$, data not shown) in 2010, but there were no differences in 2011 ($P = 0.2796$)
- Dimethoate caused 3 to 4% more visual injury, primarily as leaf burn, compared with the other insecticides in 2010 ($P = 0.0356$, data not shown), but insecticide had no effect on leaf burn in 2011 ($P = 0.8098$)
- All insecticide treatments similarly reduced immature thrips numbers and injury in both years ($P < 0.05$, data not shown)
- Ignite delayed maturity compared with Sequence in 2010 as evidenced by first and second harvest data, (data not shown), but no differences were detected in 2011
- Ignite decreased seed cotton yield compared with Sequence in 2010, but not in 2011
- Bidrin and acephate treatments increased seed cotton yield in 2011

Treatment Effects on Seed Cotton Weights (lbs/acre)

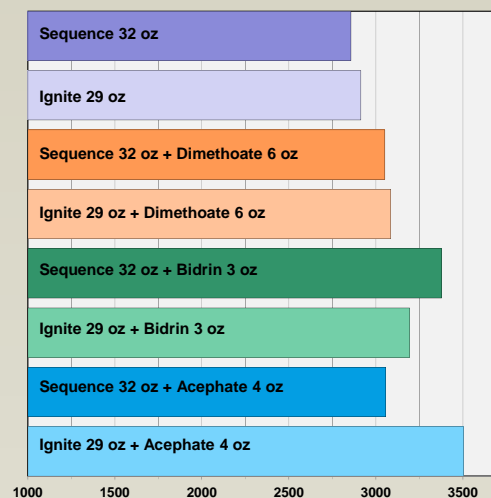
Main Effect	Treatment	Year 2010	Year 2011
Herbicide	Sequence	4733 a	3085 a
	Ignite	4160 b	3174 a
<i>Factorial Analysis</i>		$P = 0.0007$	$P = 0.3496$
		$LSD = 299$	$LSD = 193$
Insecticide	Untreated	4648 a	2885 a
	Dimethoate	4230 a	3068 ab
	Bidrin	4361 a	3286 b
	Acephate	4549 a	3280 b
<i>Factorial Analysis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

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

2010 Total Seed Cotton (lbs/acre)



2011 Total Seed Cotton (lbs/acre)



Conclusions

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.



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