EFFECT OF APPLICATION TIMING ON BURNDOWN CONTROL OF COVER-CROP WHEAT WITH GLYPHOSATE OR PARAQUAT APPLIED ALONE OR WITH ATRAZINE

James Martin, Charles Tutt, and Dottie Call
Plant & Soil Sciences Department
University of Kentucky, Princeton, KY 42445
PH: (270) 365-7541, Ext. 203; Email: jamartin@uky.edu

Introduction:

Wheat is grown as a cover crop where it is seeded in the fall and killed the following spring with tillage or burndown herbicide treatments. This practice limits soil loss during the winter months in fields prone to erosion. While tillage is very effective in controlling wheat, burndown treatments are needed where no-tillage practices are used.

Burndown treatments often include glyphosate or paraquat. These are applied alone where soybeans or certain other crops are planted; whereas, atrazine is usually added where corn or grain sorghum are planted.

Wheat that has over wintered and in the tillering stage can be difficult to kill, particularly with paraquat. Including atrazine with paraquat can enhance burndown control.

This research was conducted to determine if burndown control of cover crop wheat is affected by application timing and herbicide rate.

Results:

The three application timings in the 2007 study were February 28, March 21, or April 18, when wheat was 3, 4.5, and 12.5 inches in height, respectively. The timings for the 2008 study were February 25, March, 24 and April 21 when wheat was 4, 8, and 15 inches tall, respectively. Burndown herbicides included Roundup WeatherMAX (glyphosate) at 16, 22, and 32 oz/A and Gramoxone Inteon (paraquat) at 2 or 3 pt/A. These herbicides were applied either alone or in combination with atrazine at 1.5 lb ai/A.

Although control was evaluated at weekly intervals up to four weeks after each application timing, the only data reported are those made in mid May (Table 1).

Results of the cover-crop wheat study indicated that application timing did not significantly influence control of cover-crop wheat with any of the herbicide treatments. As expected, the initial burndown control was more rapid with paraquat than with glyphosate; however in some cases regrowth of wheat occurred by four weeks after application of paraquat. When averaged across application timings, burndown control of wheat with all paraquat treatments was 78% compared with 97% with glyphosate treatments. Including atrazine with paraquat tended to enhance wheat control, yet atrazine tended to limit the speed of control with glyphosate. In most instances the antagonism from atrazine to glyphosate diminished by mid May.

Table 1. **Effect of Application Timing on Burndown Control of Cover - Crop Wheat with Roundup WeatherMAX and Gramoxone Inteon Applied alone or with Atrazine.** (UKREC Spring of 2007 and 2008)

Burndown Herbicides [1]		Rate/A	Application Date (Wheat Height) [2]			Application Date (Wheat Height) [2]		
			2/28/07 (3")	3/21/07 (4.5")	4/18/07 (12.5")	2/25/08 (4")	3/24/08 8"	4/21/08 15.5"
			Burndown Control (%) [3]					
No Atrazine	Roundup WeatherMAX	16 oz/A	73	96	100	97	88	98
		22 oz/A	90	93	100	100	96	100
		32 oz/A	98	100	100	100	100	100
	Gramoxone Inteon	2 pt/A	33	85	57	50	27	70
		3 pt/A	73	90	77	81	50	87
Atrazine (1.5 lb ai/A)	Roundup WeatherMAX	16 oz/A	88	100	100	100	92	83
		22 oz/A	99	100	100	100	100	93
		32 oz/A	100	100	100	98	100	99
	Gramoxone Inteon	2 pt/A	88	88	77	93	93	90
		3 pt/A	99	96	83	99	88	90
			LSD $_{(0.05)}$ 7%			LSD 9%		

[1] Treatments were applied in a spray volume of 20 GPA. A nonionic surfactant at 0.25% v/v was included with paraquat.

[2] Plants in 2007 had 1 to 3 tillers during each application time.
Plants in 2008 had 3 tillers on 2/25 and 5 tillers on 3/24/ and 4/21.

[3] Control ratings were made at end of season approximately Mid May.