BURNDOWN CONTROL OF COVER-CROP WHEAT WITH GLYPHOSATE OR PARAQUAT APPLIED ALONE OR IN COMBINATION WITH ATRAZINE (UKREC 2006-2007)

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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 treatment. 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.

Methods:

Pioneer 25R35 wheat was planted October 25, 2006 in a conventional tilled seedbed. Since the field was previously fallow, approximately 30 units of nitrogen were applied to simulate carryover of nitrogen from soybeans. No additional nitrogen was applied in the spring.

A CO_2 back sprayer was used to apply treatments in a spray volume of 20 GPA. Applications were made February 28, March 21, and April 18 when wheat was 3, 4.5, and 12.5 inches in height, respectively. Gramoxone Inteon was applied at 2 to 3 pt/A. This was equivalent to 0.5 or 0.75 lb of paraquat/A. A nonionic surfactant at 0.25% v/v was included as an additive with paraquat. Roundup WeatherMAX was applied at 16, 22, or 32 oz/A which is equivalent to 0.56, 0.77, or 1.13 lb ae of glyphosate/A. No additives were included with Roundup WeatherMAX. Gramoxone Inteon and Roundup WeahterMAX were applied alone or with atrazine at 1.5 lb ai/A

Visual ratings of control were made at weekly intervals up to 4 weeks after treatment. The only data presented are the 4 weeks after treatment.

Results:

Based on ratings at 1 to 3 weeks after application, the initial control with Gramoxone Inteon was rapid, yet regrowth occurred, particularly when it was applied alone (data not shown).

Burndown control of 3-inchs tall wheat was 63 and 88% at 4 weeks after treatment when Gramoxone Inteon was applied alone at 2 and 3 pt/A, respectively; however, control was 90 and 96% when atrazine was included (see table 1). All Gramoxone Inteon treatments provided at least 90% control when wheat was 4.5 inches in height. However, control of 12-inch tall wheat ranged from 57% when Gramoxone Inteon was applied alone at the low rate of 2 pt/A to 83% when atrazine was included with Gramoxone Inteon at 3pt/A.

Control with Roundup WeatherMAX within the first few weeks after application was considerably slower than that of Gramoxone Inteon, (data not shown) There was noticeable antagonism to Roundup activity when atrazine was included, yet this declined over time.

Ratings made at 4 weeks after application indicated that Roundup WeatherMAX at the low rate of 16 oz/A provided 85% control of 3-inch tall wheat, compared with 73% when atrazine was added to the spray mix. (see table 1). Control for all other Roundup WeatherMAX treatments ranged form 90 to 100% regardless of herbicide rate or height of wheat.

Summary:

Burndown control was more rapid with Gramoxone Inteon; however there was more regrowth in many cases when compared to that of Roundup WeatherMAX.

Control with Gramoxone Inteon alone was more favorable when it was applied to wheat 4.5 inches tall compared with 3- or 12.5-inch wheat. Increasing the rate from 2 pt/A to 3pt/A increased control by as much as 25% when applied alone. Including atraizne increased control by as much as 27% when Gramoxone Inteon was applied at the low rate to 3-inch tall wheat. Similar benefits were observed when Gramoxone Inteon was applied to 12.5-inch tall wheat.

Burndown control with Roundup WeatherMAX was more variable when applied to 3-inches tall wheat compared with applications made to wheat 4.5 or 12.5 inches tall wheat. The low rate of 16 oz/A was less effective when applied to wheat 3” tall than wheat 4.5 or 12.5” tall. The antagonism caused by atrazine was obvious when the 16 oz/A rate of Roundup WeatherMAX was applied to wheat that was 3” tall. This antagonism was not an issue when wheat was treated at 4.5 or 12.5”tall.

Table 1. Burndown Control of Cover - Crop Wheat Treated in Spring at Different Plant Heights. (UKREC 2006 - 2007)

Burndown Herbicides [1]		(Rate/A)	Wheat Height. [2] 3"	4.5"	12.5"
			Burndown Control (%) [3]		
No Atrazine	Roundup WeatherMAX	16 oz	85	95	100
		22 oz	92	95	100
		32 oz	98	100	100
	Gramoxone Inteon	2 pt	63	90	57
		3 pt	88	93	77
Atrazine (1.5 qt/A)	Roundup WeatherMAX	16 oz	73	92	100
		22 oz	90	100	100
		32 oz	93	100	100
	Gramoxone Inteon	2 pt	90	92	77
		3 pt	96	96	83
				$LSD_{(0.05)}$	7%

[1] Treatments applied in a spray volume of 20 GPA. AMS was not included with Roundup WeatherMAX. A nonionic surfactant at 0.25% v/v was included with Gramoxone Inteon.

Roundup WeatherMAX		Gramoxone Inteon	
Rate/A	(glyphosate lb ae/A)	Rate/A	(paraquat lb ai/A)
16 oz/A	(0.56 lb ae/A)	2 pt/A	(0.5 lb ai/A)
22 oz/A	(0.77 lb ae/A)	3 pt/A	(0.75 lb ai/A
32 oz/A	(1.13 lb ae/A)		

[2] Application dates: (2/28/07 for 3") (3/21/07 for 4.5") (4/18/07 for 12.5")

[3] Control ratings were made at 4 weeks after application.