COMPARING GLYPHOSATE FORMULATIONS AND GRAMOXONE MAX FOR LATE-SPRING BURNDOWN CONTROL OF COVER-CROP WHEAT

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INTRODUCTION:

A number of glyphosate products with different concentrations, salts, and adjuvants have been developed over the last few years. The differences in formulations add a level of confusion and uncertainty over rate and relative effectiveness of products for burndown control of wheat.

The objective of this experiment was to evaluate different glyphosate formulations and Gramoxone Max for controlling large wheat in late April.

METHODS:

Glyphosate products evaluated in this study were ClearOut 41 Plus, Roundup UltraMax, Roundup WeatherMax, and Touchdown IQ. These were chosen because of differences in concentration and/or type of salt used with the product. Information on the formulations and label directions concerning these glyphosate products and Gramoxone Max are indicated in Table 1.

The glyphosate products were applied at 0.375 and 0.75 lb acid equivalents (ae) per acre. The rates listed in table 2 are based on amount of product as well as acid equivalent per acre.

Burndown treatments were applied to cover-crop wheat on April 26, 2003 when plants were 20 inches in height and in the early-boot stage of growth. Treatments were applied in a spray volume of 20 GPA.

Wheat control was evaluated on May 3 and 10 (i.e. 1 and 2 weeks after application).

RESULTS:

Wheat control at 1 week after application with glyphosate ranged from 47 to 67 % compared with 90% with Gramoxone Max. However, by 2 weeks after application, many glyphosate treatments provided equal or better control of wheat compared with that observed with Gramoxone Max.

Control with all four glyphosate formulations at the 0.75 lb ae/A rate was at least 93% at 2 weeks after application compared with 90% with Gramoxone Max.

Wheat control did not exceed 80% where Roundup Ultra Max, Roundup Weather Max, or Touchdown IQ were applied at the low rate of 0.375 lb ae/A. All treatments provided nearly complete control as the season progressed (data not shown).

SUMMARY / CONCLUSION:

Burndown control of wheat in the early boot stage was more rapid with Gramoxone Max than with any of the glyphosate products. However all glyphosate products applied at 0.75 lb ae/A provided equal of better control than Gramoxone Max at 2 weeks after application. As the season progressed, all treatments provided nearly complete control of wheat.

It is important to recognize that wheat may be more difficult to control, especially with Gramoxone Max, when plants are in the jointing stage than the boot stage. In these instance, glyphosate is often preferred over Gramoxone Max when these herbicides are applied alone. However, including atrazine with Gramoxone Max will often improve the level of wheat control, providing environmental conditions are favorable for root uptake of atrazine.

Table 1. **Information on Formulations and Label Recommendations For Controlling Wheat.**							
Herbicide Product	Salt (Acid)	Formulation *	Maximum Labeled Wheat Size				
			6"	12"	18"	24"	30"
			Glyphosate Product Rate (Ounces/A)				
ClearOut 41 Plus	Isopropylamine (glyphosate)	4 lb ai/gal (3 lb ae/gal)	16	-	-	-	24
Roundup Ultramax	Isopropylamine (glyphosate)	5 lb ai/gal (3.73 lb ae/gal)	13	20	32	-	-
Roundup WeatherMax	Potassium (glyphosate)	5.5 lb ai/gal (4.5 lb ae/gal)	16	22	32	-	-
Touchdown IQ	Diammonium (glyphosate)	3.75 lb ai/gal (3 lb ae/gal)	16	-	-	24	-
Gramoxone Max	Dichloride (paraquat)	4.143 lb ai/gal (3 lb ae/gal)	Gramoxone Max Rate for Weed Size 1.3 to 1.7 pt/A for 1 to 3 " weeds 1.7 to 2.0 pt/A for 3 to 6 " weeds 2.0 to 2.7 pt/A for 6 " weeds For best results apply prior to tillering or after boot stage. Applications made between tillering and boot stage will generally not provide complete control.				
* Active ingredient (ai) accounts for the weight of the herbicide acid plus the salt. Acid equivalent accounts only for weight of the parent herbicide acid.							

T*able 2.* **Comparing Different Glyphosate Formulations and Gramoxone Max For Burndown Control of Wheat** (UKREC 2003)				
Herbicide	Rate/A		Wheat Control (%)	
	Product	Acid equivalent	(5/3/03)	(5/10/03)
ClearOut 41 Plus	16 oz/A	0.375 lb ae/A	57	93
	32 oz/A	0.75 lb ae/A	67	98
Roundup Ultra Max	13 oz/A	0.375 lb ae/A	67	77
	26 oz/A	0.75 lb ae/A	67	96
Roundup Weather Max	11 oz/A	0.375 lb ae/A	47	80
	22 oz/A	0.75 lb ae/A	53	93
Touchdown IQ	16 oz/A	0.375 lb ae/A	47	80
	32 oz/A	0.75 lb ae/A	67	97
Gramoxone Max	2 pt/A	0.75 lb ae/A	90	90
LSD (0.05)			10	6
1. Treatments were applied April 26, 2003. Wheat Average height = 20", early boot stage. 2 Ammonium sulfate (AMS) was included with all glyphosate treatments at a rate of 3.7% v/v. A nonionic surfactant at a rate of 0.25% was included with the Gramoxone Max treatment.				