WHEAT RESPONSE TO SELECTED FOLIAR - APPLIED HERBICIDES WHEN APPLIED THE SAME DAY AS TOPDRESSING NITROGEN FERTILIZER. (UKREC 2009-2010)

James R. Martin, Charles R. Tutt, and Dorothy L. Call
Department of Plant and Soil Sciences
University of Kentucky, Princeton, KY 42445-0469.
PH: (270) 365-7541 Ext 203; Email: jamartin@uky.edu

INTRODUCTION

There have been a number of situations where topdressing nitrogen fertilizer interacts with certain herbicides resulting in wheat injury. Osprey (mesosulfuron) was one of the first foliar-applied herbicides that injured wheat when applied in the spring near the time of topdressing nitrogen fertilizer. Recent research indicates PowerFlex (pyroxsulam) can cause a similar response. The injury of using liquid nitrogen fertilizer as a carrier, in place of water, for applying such herbicides as Harmony (thifensulfuron) with liquid nitrogen fertilizer was often believed to be associated with the burning effect of the nitrogen when sprayed onto foliage of plants.

The objective of this research was to evaluate wheat response to various herbicide treatments applied the same day as topdressing nitrogen fertilizer.

METHODS

Liquid nitrogen (28%) at 40 GPA (120 units of N/A) was applied over the entire study March 10, 2010 with TeeJet stream tips (SJ 7-05 VP). All herbicides were then applied in water using 8003 DG Flat Fan tips at a spray volume of 20 GPA. Most herbicide treatments included an Acetolactate Synthase Inhibitor (ALS) since these herbicides can injure wheat, especially during periods of stress. Axial XL is the only treatment that did not have an ALS inhibitor herbicide as a component (See table 1 for a list of herbicides).

Wheat height was determined from 5 random plants measured at weekly intervals up to 6 weeks after application and at maturity. Height differences were based on height of herbicide treated plants minus height of plants in the non-treated checks.

RESULTS

Some chlorosis was observed in all treatments during the first two weeks after treatment (WAT) but did not differ from the non-treated check (Data not shown).

By 2 WAT wheat heights in all herbicide treatments were numerically shorter (i.e. a negative value) than those in the check. Stunting was statistically significant for most treatments for measurements at 2 and 3 WAT, except for Finesse Grass & Broadleaf and for Harmony Extra at 2 WAT.

Based on statistical analysis, none of the herbicides limited wheat yield, yet it is interesting to note that yields of all herbicide treatments were numerically less compared with those of the non-treated check.

Table 1. **WHEAT RESPONSE TO HERBICIDES APPLIED SAME DAY AS TOPDRESSING NITROGEN FERTILIZER (UKREC 2009-2010)**									
	WHEAT HEIGHT REDUCTION OVER TIME**							**TEST WT (lb/Bu)**	**YIELD (Bu/A)**
TREATMENT *	**1 WAT**	**2 WAT**	**3 WAT**	**4 WAT**	**5 WAT**	**6 WAT**	**Maturity**		
Atlantis + NIS	-0.38	**-1.43**	**-2.43**	-1.73	- 2.10	-1.50	-1.38	59.9	113.6
Axial XL	0.15	**-1.2**	**-2.35**	-1.73	-1.90	-1.95	-1.23	58.7	109.8
Finesse Grass & Broadleaf + NIS	0.25	-0.95	**-1.68**	-1.18	-1.85	-1.28	-2.53	60.2	114.6
Harmony Extra + NIS	0.25	-0.78	**-2.30**	-1.50	-1.08	-1.35	-1.78	58.4	105.4
Olympus Flex + NIS	-0.20	**-1.20**	**-1.78**	-1.68	-1.30	-0.95	-1.08	58.1	107.8
Osprey + NIS	-0.13	**-1.58**	**-1.78**	-1.33	-1.73	-1.43	-1.25	59.3	112.3
PowerFlex + NIS	-0.48	**-1.55**	**-1.88**	-1.93	-1.78	-1.65	-1.55	58.9	113.9
PowerFlex + COC	-0.33	**-1.38**	**-2.13**	-1.48	-1.70	-1.48	-0.98	61.9	113.5
Power Flex + 2,4-D + NIS	-0.05	**-2.03**	**-2.58**	-2.25	-2.40	-1.95	-1.48	57.3	111.0
PowerFlex + Clarity + NIS	-0.15	**-1.55**	**-1.73**	-0.88	-1.38	-1.58	-1.05	58.1	111.2
PowerFlex + Harmony Extra + NIS	-0.10	**-1.48**	**-1.78**	-0.98	-1.85	-1.63	-1.30	60.0	112.8
Check	0	0	0	0	0	0	0	59.0	118.9
LSD (0.05)	NS	0.95	1.05	NS	NS	NS	NS	2.4	NS

* Herbicides were applied 03-10-2010 in 20 GPA spray volume using 8003 DG Falt Fan Spray Tips. Liquid N at 40 GPA was also applied same day as herbicides using StreamJet tips (SJ7-05 VP).

** Wheat heights were determined from 5 random plants measured at weekly intervals for 1 through 6 Weeks After Application (WAT) and at maturity. Height differences were based on height of herbicide treated plants minus non-treated check. Shaded cell indicates height difference between treated plants and non-treated plants was statistically significant.

Disclaimer: These results are based on one growing season at a single location and may not reflect what will occur in other environments.