

WHEAT RESPONSE TO OSPREY AND POWERFLEX WHEN NITROGEN FERTILIZER IS TOPDRESSED AT DIFFERENT TIMES (2008-2009)

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Osprey (mesosulfuron methyl) and PowerFlex (pyroxsulam) are foliar-applied herbicides used to manage weedy grasses after wheat emergence. Both products are an Acetolactate Synthase (ALS) inhibitor that can injure wheat; consequently, they formulated with a safener. PowerFlex is a relative new product that does not have any cases of injury in Kentucky, whereas a few isolated cases of Osprey injury have been reported, particularly when it was applied near the time of topdressing nitrogen fertilizer.

METHODS

Although Osprey and PowerFlex were evaluated in separate studies, the methods used were very similar. Both herbicides were applied March 13, 2009 in water at spray volume of 20 GPA with 8003 flat fan tips. The commercial formulations of both products were formulated with a safener. Osprey was applied at a rate of 4.75 oz/A plus surfactant at 0.5% (v/v), plus 28% liquid nitrogen at 1 qt/A. PowerFlex was applied at a rate of 3.5 oz/A + Activator 90 at 0.5% v/v + dry Ammonium Sulfate at 1.52 lb/A.

Liquid nitrogen (28%)n was applied with TeeJet stream tips at 40 gal/A (120 units of N/A). The timing for topdressing nitrogen in the PowerFlex study occurred over a period of five weeks at weekly intervals designated as -14, -7, 0, +7, and +14 days

relative to timing of PowerFlex. In addition to these timings, the Osprey study also included -21 and +21 days. Each nitrogen timing had a duplicate set of plots with one group receiving herbicide at day 0 and the other set of plots without herbicide.

The Osprey trial was a part of a three-year study. Data discussed in this report were limited to the third year; whereas, information on the first and second year's research were reported in previous Wheat Science Research Reports. This is the first year of research with PowerFlex.

OSPREY RESULTS

Wheat injury from Osprey occurred in the form of yellow or necrotic leaves and stunted plants. In most cases wheat plants were numerically shorter than the non-treated checks within one to two weeks after Osprey.

Table 1 shows the difference in height between wheat plants that were treated with Osprey compared with the herbicide check for each timing of topdressing nitrogen fertilizer. The amount of stunting was usually greater when nitrogen fertilizer was topdressed the same day as spraying Osprey (i.e. 0-day timing of N fertilizer). The nitrogen timings that caused significant height reduction were -14, -7 and 0-day Osprey treated plants. These plants recovered by the time wheat was mature.

The later timings did not appear to cause significant stunting of wheat.

The most significant discoloration occurred when Osprey and nitrogen fertilizer were applied the same day but lasted only two weeks after Osprey application (Table 2). Discoloration due to Osprey was observed with the -14 and -7 day timings of nitrogen, but the symptoms due to herbicide lasted for only one week. Discoloration due to Osprey was not a factor when nitrogen was topdressed after Osprey.

Although injury from Osprey was observed with certain nitrogen timings, it did not affect wheat yield (Figure 1). There was a general trend for greater wheat yields with the early nitrogen timings compared with the late timings.

POWERFLEX RESULTS

The results of the PowerFlex study were similar to those observed in the Osprey Study. Injury symptoms in the form of stunting and discoloration tended to be greatest when PowerFlex and nitrogen were applied the same day. Although stunting was observed at certain times for the -7 days nitrogen treatment, it was not consistent throughout the spring (Table 3). Any differences in height of plant for the

+14 days timing were not statistically significant.

Discoloration from PowerFlex did occur, however, it was difficult to find a meaningful trend (Table 4).

Wheat yields in the PowerFlex study ranged from 90.3 to 105.8 bu/A (Figure 2). The injury that was observed from PowerFlex did not impact wheat yield. Wheat yields tended to be greater with the early nitrogen timings compared with the late timings.

SUMMARY

Topdressing nitrogen fertilizer the same day as applying Osprey or PowerFlex will injure wheat in the form of stunted plants and chlorotic to necrotic foliage and may sometimes limit wheat yield. Although wheat injury may occur, the risk of it impacting wheat yield should be minimal (if any) when following label directions. The interval between herbicide application and topdressing nitrogen fertilizer is 14 days for Osprey and 7 days for PowerFlex.

ACKNOWLEDGEMENTS

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**Table 1. Wheat Height Reduction When Topdressed with N
at Different Times Relative to Osprey
(UKREC 2008-2009)**

TIMING FOR TOPDRESSING	1 WAT	2 WAT	3 WAT	4 WAT	5 WAT	6 WAT	MATURITY
	Wheat height reduction in inches beginning 1 week after Osprey and ending at maturity						
- 21 Days	- 0.9	- 0.8	- 1.4	- 2.0	- 1.6	- 1.8	- 0.8
- 14 Days	- 1.2	- 1.5	- 1.8	- 1.2	- 1.4	- 1.9	- 0.7
- 7 Days	- 1.9	- 1.6	- 0.5	- 1.4	- 1.1	- 2.0	- 0.6
0 Day	- 1.5	- 2.5	- 3.6	- 2.9	- 3.0	- 3.0	- 1.0
+ 7 Days	- 0.2	- 0.2	- 0.8	- 0.4	0.3	0.1	0.5
+ 14 Days	- 0.1	- 0.5	- 0.3	-.1	0.3	0.1	0.3
+ 21 Days	0.1	0.1	0.0	- 0.1	- 0.2	- 0.1	- 0.5

Heights measured weeks at 1 through 6 weeks after Osprey treatment and at maturity.
Shaded cells indicate statistical significant height reduction from Osprey within each study.

**Table 2. Wheat Discoloration Ratings When Topdressing with N
at Different Times Relative to Osprey
(UKREC 2006-2007, 2007-2008, and 2008-2009)**

TIMING FOR TOPDRESSING	1 WAT	2 WAT	3 WAT	4 WAT	5 WAT	6 WAT
	Percent Discoloration 1 through 6 weeks after Osprey					
- 21 Days	13	8	1	3	0	5
- 14 Days	13	5	1	0	0	0
- 7 Days	20	5	0	0	0	0
0 Day	48	15	4	3	0	0
+ 7 Days	23	18	6	5	0	0
+ 14 Days	20	33	28	10	0	0
+ 21 Days	25	35	38	40	9	3

Discoloration rating based on a percentage scale 0 = no discoloration 100 = complete loss of green color
Shaded cells indicate statistical significant discoloration from Osprey within each study.

**Table 3. Wheat Height Reduction When Topdressed with N
at Different Times Relative to PowerFlex
(UKREC 2008-2009)**

TIMING FOR TOPDRESSING	1 WAT	2 WAT	3 WAT	4 WAT	5 WAT	6 WAT	MATURITY
	Wheat height reduction in inches beginning 1 week after Osprey and ending at maturity						
- 14 Days	- 1.03	- 1.62	- 1.30	- 1.25	- 2.2	- 1.55	- 0.88
- 7 Days	- 1.93	- 2.2	- 3.15	- 1.67	- 2.83	- 2.03	- 1.58
0 Day	- 1.85	- 3.72	- 3.17	- 3.58	- 3.43	- 2.78	- 1.52
+ 7 Days	- 0.4	- 0.98	- 2.02	- 1.35	- 0.62	- 1.43	- 0.85
+ 14 Days	- 0.25	+ 0.1	+ 0.1	- 0.17	- 0.07	0.5	+ 0.8

Heights measured weeks at 1 through 6 weeks after Osprey treatment and at maturity.
Shaded cells indicate statistical significant height reduction from Osprey within each study.

**Table 4. Wheat Discoloration Ratings When Topdressing with N
at Different Times Relative to PowerFlex
(UKREC 2008-2009)**

TIMING FOR TOPDRESSING	1 WAT	2 WAT	3 WAT	4 WAT	5 WAT	6 WAT
	Percent Discoloration 1 through 6 weeks after Osprey					
- 14 Days	9	10	5	5	1	3
- 7 Days	13	10	6	8	0	0
0 Day	40	15	10	8	0	0
+ 7 Days	25	23	10	10	0	0
+ 14 Days	23	33	43	13	0	0

Discoloration rating based on a percentage scale 0 = no discoloration 100 = complete loss of green color
Shaded cells indicate statistical significant discoloration from Osprey within each study.

Figure 1. Wheat Yield When Topdressed with N Fertilizer at Different Times Relative to Osprey (UKREC 2008-2009)

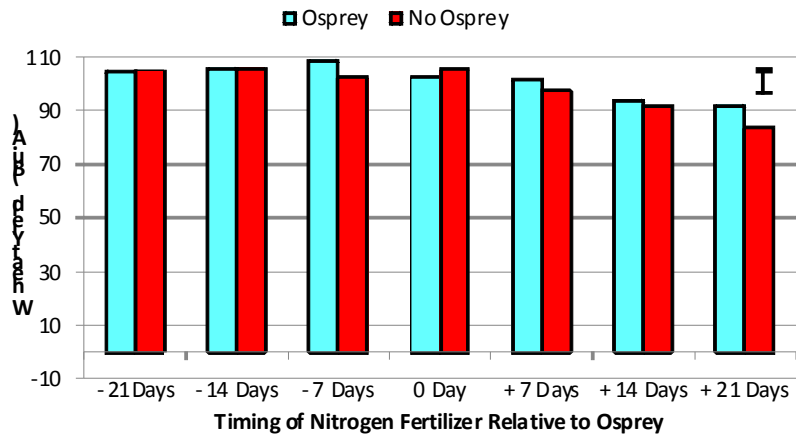


Figure 2. Wheat Yield When Topdressed with N Fertilizer at Different Times Relative to PowerFlex (UKREC 2008-2009)

