

PowerFlex® carryover and injury to alfalfa

A study was established in Othello, WA to evaluate PowerFlex (pyroxsulam) carryover and injury to alfalfa planted after winter wheat. The study was conducted first over the years 2011 to 2013 and repeated in 2013 to 2014. Winter wheat was planted on September 29, 2011. In place of winter wheat, spring wheat was planted on May 23, 2013. The soil was a silt loam with a pH of 8.4 and organic matter of 1.67%. Plots were 8 ft by 35 ft and arranged in a randomized complete block design with 4 replications. Herbicides were applied on the wheat crop with a CO₂-pressurized backpack sprayer (Table 1) at 15 GPA. Treatments included PowerFlex (pyroxsulam), Maverick® (sulfosulfuron) and Starane® Flex (fluroxypyr plus florasulam) (Table 2). Alfalfa was planted on August 27, 2012 and September 26, 2013. Stand counts of alfalfa seedlings were taken on October 17, 2012 for the first study and on April 4, 2014 for the second study. Wheat yields were sampled in 2012, but not in 2013. Wheat yields were not different (Table 2). Fresh biomass was measured on June 3, 2013 and July 15, 2013 by mowing a 3 ft wide band along the center of each plot. In 2014, fresh biomass was measured using the same method on June 17 and by clipping crop biomass from two, 7 ft² quadrats in the center of each plot on July 26. Sub-samples were collected from each plot to determine dry matter percent in 2014. Crop canopy height was measured by recording 3 measurements in each plot before each cutting in 2014.

Stand counts did not differ among treatments in either year (Tables 2 and 3). No injury to alfalfa was observed during the 2013 growing season. In 2014, stunting and chlorosis were observed and differed among treatments early in the season (Table 3), but differences subsided later in the season (data not presented). Alfalfa yields were not different among treatments in 2013 (Table 2) or 2014 (Table 3). Crop canopy height was not different at either cutting in 2014 (data not presented).

Table 1. Environmental conditions at herbicide application on wheat for the years 2012 and 2013

Application date	April 5, 2012	June 14, 2013
Application timing (wheat canopy height in inches)	9 to 10	3 to 5
Air temperature (°F)	48	72
Soil temperature (°F)	50	64
Wind velocity (MPH)	3	3.5
Cloud cover (%)	0	40

Table 2. Treatment means for wheat yield in 2012, alfalfa stand count and yields, 2012-2013.

Treatment	Rate		August 1, 2012	October 17, 2012	June 6, 2013	July 15, 2013
	oz pr/A	lb ai/A	Wheat yield bu/a	Alfalfa stand count plants/ft ²	Alfalfa yield ton/A	
Nontreated Check			85.5	18	3.5	3
PowerFlex	2	0.016	84.3	13	5.1	3.3
AGRAL 90*	0.5 % v/v					
Actamaster*	24.25					
PowerFlex	4	0.032	94	16	5	3.4
AGRAL 90	1 % v/v					
Actamaster	48.5					
Starane Flex	13.5	0.089 (fluroxypyr) + 0.003 (florasulam)	94.6	16	5.2	3.1
Starane Flex	27	0.178 (fluroxypyr) + 0.006 (florasulam)	90.4	16	4.5	3.5
Maverick	0.67	0.062	93.3	16	5.4	3.6
AGRAL 90	0.5 % v/v					
Maverick	1.33	0.125	92.1	15	4.6	3.6
AGRAL 90	1 % v/v					

*AGRAL 90 is a non-ionic surfactant marketed by NORAC. Actamaster is an ammonium sulfate based spray adjuvant marketed by Loveland.

Table 3. Treatment means for alfalfa stand count, injury and yield in 2014.

Treatment	Rate		April 4, 2014	May 29, 2014	June 17, 2014	July 24, 2014
			Alfalfa stand count	Alfalfa injury	Alfalfa yield	
	oz pr/A	lb ai/A	plants/ft ²	%	lbs dry matter/A	
Nontreated Check			10	-	5120	7420
PowerFlex	2	0.016	10	23 bcd	5180	8300
AGRAL 90*	0.5 % v/v					
Actamaster*	24.25					
PowerFlex	4	0.032	9	30 ab	5400	6600
AGRAL 90	1 % v/v					
Actamaster	48.5					
Starane Flex	13.5	0.089 (fluroxypyr) + 0.003 (florasulam)	8	24 bcd	5330	6590
Starane Flex	27	0.178 (fluroxypyr) + 0.006 (florasulam)	10	28 abc	4630	5960
Maverick	0.67	0.062	9	4 cd	6340	6270
AGRAL 90	0.5 % v/v					
Maverick	1.33	0.125	10	8 bcd	5110	5660
AGRAL 90	1 % v/v					

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Some of the pesticides discussed in this presentation were tested under an experimental use permit granted by WSDA. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to \$7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance.