Comparing Rates of Carfentrazone plus Pyroxasulfone (Anthem Flex) with and without Metribuzin for Weed Control in Lentil

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A trial was conducted to evaluate lentil response and resulting weed control from spring application of carfentrazone plus pyroxasulfone (Anthem Flex) applied as a spring preemergence application at planting. Lentil 'Imvincible CL' was planted on May 5, 2020 using a no till drill at a rate of 25 seed per square foot at a depth of 1.5 inches. On May 6, herbicide treatments were applied using a tractor-mounted research sprayer at a spray volume of 10 gallons per acre using 8002XP flat fan nozzles. All treatments were tank-mixed with glyphosate (Roundup PowerMAX at 22 oz/acre) + AMS (8.5 lbs/100 gallons) + Destiny HSOC (1% v/v) to control weeds that had emerged prior to planting. Lentil emergence occurred on May 19. Between planting and lentil emergence rainfall of 0.23 inched occurred (May 7). During the first six weeks after planting, other substantial rainfall (> 0.05 inches) events occurred on June 2 (0.12 inches), June 4 (0.09 inches), and June 6 (0.16 inches). During the last week of June and first week of July, 3.14 inches of rainfall occurred. Lack of rainfall during the first six weeks of growth limited activation of the applied preemergence herbicides and also limited the germination and growth of summer annual weeds. The rainfall that occurred at the end of June and first of July allowed for herbicide activation and encouraged crop growth and emergence of green foxtail. No other weeds were evaluated due to low and uneven emergence rates.

Lentil injury was evaluated 8 and 14 days after emergence; no injury was observed during either evaluation. It is possible that the lack of substantial rainfall during May and early June limited lentil response to applied herbicides. Under normal or above normal rainfall conditions, results would possibly have been different. Stand counts were measured on June 8 using two randomly placed 0.5 m^2 quadrats placed in each plot and then counting numbers of lentil plants. There were no differences in lentil stand counts due to herbicide application. Lentil height was measured on June 29 (6 weeks after lentil emergence) by measuring height of 10 random plants within each plot. No difference in lentil height was found. Green foxtail control was evaluated on July 10 (65 days after treatment application). Green foxtail control increased with increasing rates of carfentrazone plus pyroxasulfone (Anthem Flex). The addition of metribuzin did not consistently improve foxtail control. The herbicide pyroxasulfone is a preemergence herbicide that is active on grass seedling weeds as well as some small seeded broadleaf weed; it has little or no postemergence activity. Pyroxasulfone required a half inch or more of rainfall to be properly incorporated and activated within the soil profile where weed seeds are germinating. Where green foxtail is a summer annual grass that emerges during the summer months, often coinciding with rainfall events, the application of a preemergence herbicide, such as pyroxasulfone, will help to control this weed as it is emerging. Lentil yield was measured on August 12 using a small plot combine. All carfentrazone plus pyroxasulfone treatments, with and without metribuzin yield greater than the untreated control and most yielded greater than the pendimethalin control treatment.

Table 1. Comparison of Anthem Flex with and without metribuzin for weed control in lentil.

Treatment		Lentil			Green foxtail	
Product name	Rate	Injury	Stand count	Height	control	Yield
	(oz/A)	—%—	—#/m^2—	—cm—	—%—	lbs/acre
1 Anthem Flex	3.5	0 -	276.5 -	25.3 -	69.3 d	1695 a-d
2 Anthem Flex	4	0 -	234.5 -	25.6 -	76.3 cd	1945 a
3 Anthem Flex	3.5	0 -	264.0 -	25.3 -	69.3 d	1524 cd
Metribuzin DF	2					
4 Anthem Flex	4	0 -	265.0 -	24.8 -	84.0 abc	2018 a
Metribuzin	2	0 -				
5 Anthem Flex	3.5	0 -	262.5 -	25.7 -	87.5 abc	1923 abc
Metribuzin	4					
6 Anthem Flex	4	0 -	262.0 -	25.6 -	84.8 abc	1821 abc
Metribuzin	4	0 -				
7 Anthem Flex	3.5	0 -	266.8 -	25.0 -	78.0 bcd	1567 bcd
Metribuzin	5.3					
8 Anthem Flex	4	0 -	253.3 -	24.3 -	87.0 abc	1699 a-d
Metribuzin	5.3					
9 Anthem Flex	6	0 -	259.3 -	25.1 -	91.8 a	1927 ab
10 Prowl H2O	40	0 -	263.3 -	25.6 -	89.5 ab	1406 d
11 Untreated		0 -	256.0 -	24.5 -	0 e	954 e
LSD P=.10		NS	31.68	1.65	11.78	367.3
CV		0.0	10.14	5.46	13.21	18.01
Treatment F		0.000	0.627	0.457	27.676	3.424
Treatment Prob(F)		1.0000	0.7793	0.9044	0.0001	0.0049

Lentil injury was evaluated on May 27 and June 8; no injury was observed at either date.
Stand count of lentil was measured on June 8 using two 0.5 m^2 quadrats per plot.
Lentil height was measured on June 29 (6 weeks after emergence) by measuring height of 10 random plants per plot.
Green foxtail control was evaluated on July 10 (65 days after treatment application).