

Field Pea and Lentil Response to Fall-Applied Preemergence Herbicides

Caleb Dalley, Daniel Abe, Hettinger Research Extension Center

A trial was conducted to evaluate field pea and lentil response and resulting weed control from fall application of soil active preemergence herbicides. On October 8, 2019, herbicide treatments were applied (see table) 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. Field pea and lentil were planted on May 5, 2020 using a no till drill. Field pea ‘Salamanca’ were planted at a rate of 120 lbs seed per acre at a depth of 2.5 inches. Lentil ‘Invincible’ was planted at a rate of 15 seeds per square foot at a depth of 1.5 inches. No additional herbicides were applied after planting.

Injury to pea and lentil were evaluated 8 days after crop emergence. No injury was observed for any herbicide treatment in field pea. In lentil, injury occurred with herbicide treatments containing sulfentrazone (Spartan Charge and Spartan Elite). This injury was visible as necrotic lesions (dead tissue) on leaves and stems. Crop stand was measured using two 0.5 m² quadrats per plot on June 9, three weeks after crop emergence. No herbicide treatment affected crop stand within each crop. Control of three weed species, kochia, common lambsquarters, and green foxtail, was evaluated on June 23, five weeks after crop emergence. Kochia control was 95 to 100% for all herbicide treatments. Common lambsquarters was controlled 95 to 100% with herbicides containing sulfentrazone (Spartan Charge and Spartan Elite). Control of common lambsquarters with other herbicide treatments was poor and ranged from 18 to 38%. Control of green foxtail was best at 78-81% with application of sulfentrazone plus metolachlor (Spartan Elite). Control was fair 56-61% with carfentrazone+pyroxasulfone (Anthem Flex) and was poor with pyroxasulfone+flumioxazin (Fierce). All other treatments provided no control of green foxtail. Better control of green foxtail with Anthem Flex versus Fierce, both of which contain the herbicide pyroxasulfone, was related to the higher rate of pyroxasulfone in the Anthem Flex application (2.1 oz of pyroxasulfone active per acre) compared with Fierce (1.3 oz of pyroxasulfone active per acre). Crop height was measured on June 23 by measuring the height of 10 random plants per plot. There were a few differences in the height of field pea but there were no differences in lentil height. The differences in the height of field pea was small and is not easily explained as there was no visual injury and it did not appear related to differences in weed control. Field pea and lentil were both harvest on August 12 using a small plot combine (Kincaid XP). Yield of field pea was increased, compared with the untreated control (1597 lbs/acre), following application of sulfentrazone plus carfentrazone (Spartan Charge), 1904 lbs/acre; and sulfentrazone plus metolachlor (Spartan Elite), 1872 lbs/acre. All other treatments yielded similar to the untreated control. Lentil yield was increased compared to the untreated control (1665 lbs/acre) only with application of pyroxasulfone plus flumioxazin (Fierce), 1996 lbs/acre. While some treatments yielded numerically less than the untreated control, no treatment resulted in yields that were statistically different. These trials show the value of fall application of preemergence herbicide for improved efficacy of spring weed control.

Table 1. Field pea and lentil and weed control response to fall application of preemergence herbicides.

Treatment		Crop	Injury		Control		Stand	Height	Yield
Product name	Rate		8 DAE	Kochia	Lamb	G. fox			
		(oz/A)	%			#/m ²	cm	lb/acre	
1	Untreated	Pea	0 c	0 b	0 e	0 e	58 b	37 bcd	1597 de
2	Valor	Pea	0 c	100 a	19 d	0 e	62 b	39 ab	1552 de
3	Valor	Pea	0 c	95 a	25 cd	0 e	69 b	39 ab	1656 cde
4	Spartan Charge	Pea	0 c	100 a	98 a	0 e	71 b	41 a	1904 abc
5	Anthem Flex	Pea	0 c	96 a	35 bc	56 b	69 b	37 bc	1797 a-d
6	Fierce	Pea	0 c	100 a	28 bcd	23 d	66 b	35 d	1682 b-e
7	Spartan Elite	Pea	0 c	100 a	95 a	78 a	61 b	36 cd	1872 abc
8	Untreated	Lentil	0 c	0 b	0 e	0 e	250 a	20 e	1665 b-e
9	Valor	Lentil	0 c	100 a	18 d	0 e	249 a	20 e	1509 e
10	Valor	Lentil	0 c	96 a	38 b	0 e	268 a	21 e	1518 e
11	Spartan Charge	Lentil	13 b	100 a	96 a	3 e	254 a	19 e	1574 de
12	Anthem Flex	Lentil	0 c	95 a	38 b	61 b	260 a	19 e	1916 ab
13	Fierce	Lentil	0 c	100 a	30 bc	41 c	254 a	20 e	1996 a
14	Spartan Elite	Lentil	23 a	100 a	100 a	81 a	250 a	19 e	1664 cde
LSD P=.10			4.29	5.70	10.28	7.92	20.13	2.31	252.56
CV			142.0	5.66	19.56	27.84	10.67	6.73	12.42
Treatment F			14.13	224.44	72.47	89.55	134.49	92.15	2.31
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0218

Treatments were applied on Oct 8, 2019.

All treatments were tank mixed with glyphosate (Roundup PowerMAX at 22 oz/acre) plus AMS (8.5 lb/100 gal) and HSOC (1% v/v).

Weeds evaluated were kochia, common lambsquarters, and green foxtail

Crop stand was measured using two 0.5 m² quadrats per plot and was measured on Jun 9, at 3 weeks after crop emergence.

Crop height was average of 10 random plants per plot and was measured on June 23, at 7 weeks after crop emergence.

Field pea and lentil were planted on May 5, 2020.