

Broadleaf Weed Control in Lima Beans  
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A study was conducted in 2006 to develop herbicide options for broadleaf weed control in lima beans. The trial was conducted at Paterson, WA on a Quincy sand, pH 6.8, 0.4% O.M. The experimental design was a randomized complete block design with four replications.

Lima beans, var. 'M15' were planted May 26, 2006, in 22 inch rows and seed spaced 2.3 inches within the row. Dry beans had been grown the previous year and the field was infested with a natural population of hairy nightshade, black nightshade, common lambsquarters, and pigweed.

Preemergence (PRE) herbicide treatments – applied May 31, 2006

1. Outlook 0.66 lb ai/a
2. Dual II Magnum 1.3 lb ai/a
3. Dual II Magnum 1 lb ai/a

Postemergence (POST) treatments – applied June 26, 2006 when lima beans had three trifoliolate leaves and were 5 to 8 inches tall. All POST treatments received Dual II magnum at 1 lb ai/a preemergence.

1. Raptor 0.03 lb ai/a + Basagran 1 lb ai/a
2. Reflex 0.125 lb ai/a
3. Reflex 0.188 lb ai/a
4. Reflex 0.25 lb ai/a
5. Firstrate 0.016 lb ai/a
6. Basagran 1 lb ai/a
7. Nontreated weedy control
8. Hand-weeded control

All POST treatments included NIS at 0.25% (v/v) spray solution. All herbicides were applied with a backpack CO2 sprayer at 2.5 mph, 27 psi, 8002 XR nozzles, 20 gpa carrier volume.

Weed control and lima bean injury were rated at 1, 2, and 4 weeks after POST treatments were applied. Lima beans were harvested August 30, 2006 from the center two rows of each plot by 10 ft. All plants from the harvested area were weighed and a ten plant subsample from each plot was weighed and all pods removed by hand. All pods from the ten plant subsample were weighed and then a 20 pod subsample was shelled and bean: pod weight ratio determined.

### Results.

All PRE treatments did not injure lima beans appreciably (Table 1). Outlook and Dual II Magnum PRE treatments controlled black nightshade and pigweed well (Table 2). Hairy nightshade and lambsquarters control ranged from 85 to 95%, and escape weeds were enough to reduce lima bean yield in Outlook plots compared to hand weeded checks (Table 1).

Raptor plus Basagran or Basagran alone applied POST gave excellent control of all broadleaf weeds with little or no injury to lima beans. Firstrate controlled all broadleaf weeds well except common lambsquarters and did not injure lima beans (Table 2).

Reflex injured lima beans at all rates tested and stunted the beans season long (Table 1). Reflex controlled nightshades and pigweed well, but control of common lambsquarters was only 87 to 91% at 4 WAT (Table 2).

Uncontrolled weeds in nontreated checks reduced lima bean yield by 95% compared to hand weeded checks and averaged only 0.12 ton/acre (Table 1). Lima bean yield was greatest and similar to hand weeded checks with Raptor plus Basagran or Basagran alone applied POST following Dual II Magnum PRE (Table 1). Lima bean yield was slightly lower in plots treated with Firstrate POST, Outlook PRE, and Dual II Magnum PRE probably due to common lambsquarters escapes. Lima bean yield in plots treated with Reflex was lowest and similar to that of nontreated weedy checks due to excessive herbicide injury and stunting (Table 1).

PRE applied Dual II Magnum followed by Raptor plus Basagran or Basagran alone applied POST provided excellent broadleaf weed control with minimal injury to lima beans. Reflex was too injurious to consider a registration for use in lima beans. Firstrate was safe on lima beans and could be useful in fields where nightshade or pigweed are the major broadleaf weed problems. Firstrate tended to be relatively weak on common lambsquarters in this trial.

Table 1. Lima bean injury and yield after treating with various PRE and POST herbicide treatments at Paterson, WA in 2006.

Crop Code (PHSLU = lima bean) Part Rated			PHSLU	PHSLU	PHSLU	PHSLU	PHSLU Shelled	PHSLU
Rating Data Type			Injury	injury	injury	Pod yield	Bean yield	bean/pod
Rating Unit			%	%	%	t/a	t/a	wt Ratio
Rating Date			7/3/06	7/10/06	7/24/06	8/30/06	8/30/06	8/30/06
Trt No.	Treatment Name	Rate Unit	1	5	10	15	16	17
1	Dimethenamid (Outlook)	0.66 lb ai/a	0.00 f	0.00 d	0.00 d	2.68 de	1.21 cde	0.45 a
2	Metolachlor (Dual II Mag)	1.3 lb ai/a	0.00 f	1.25 d	1.25 d	3.11 cde	1.49 bcd	0.48 a
3	Metolachlor (Dual II Mag)	1 lb ai/a	8.25 d	5.25 d	0.00 d	6.38 a	2.87 a	0.45 a
	Imamox (Raptor)	0.03 lb ai/a						
	Bentazon (Basagran)	1 lb ai/a						
	NIS (R-11)	0.25 % v/v						
4	Metolachlor (Dual II Mag)	1 lb ai/a	15.50 c	18.00 c	18.25 c	3.36 cde	1.31 cd	0.36 bc
	Fomesafen (Reflex)	0.125 lb ai/a						
	NIS (R-11)	0.25 % v/v						
5	Metolachlor (Dual II Mag)	1 lb ai/a	20.00 b	25.75 b	33.25 b	2.48 e	0.87 def	0.31 cd
	Fomesafen (Reflex)	0.188 lb ai/a						
	NIS (R-11)	0.25 % v/v						
6	Metolachlor (Dual II Mag)	1 lb ai/a	29.25 a	40.50 a	50.00 a	1.70 ef	0.44 ef	0.26 d
	Fomesafen (Reflex)	0.25 lb ai/a						
	NIS (R-11)	0.25 % v/v						
7	Metolachlor (Dual II Mag)	1 lb ai/a	4.75 e	1.25 d	0.00 d	4.33 bcd	1.93 bc	0.45 a
	Chloransulam (Firstrate)	0.0156 lb ai/a						
	NIS (R-11)	0.25 % v/v						
8	Metolachlor (Dual II Mag)	1 lb ai/a	4.75 e	0.75 d	0.00 d	5.82 ab	2.72 a	0.47 a
	Bentazon (Basagran)	1 lb ai/a						
	NIS (R-11)	0.25 % v/v						
9	Weedy check		0.00 f	0.00 d	0.00 d	0.30 f	0.12 f	0.43 ab
10	Metolachlor (Dual II Mag) Handweeded	1 lb ai/a	0.00 f	0.00 d	0.00 d	4.67 abc	2.21 ab	0.47 a
LSD (P=.05)			3.236	7.051	11.072	1.626	0.742	0.083
Standard Deviation			2.230	4.860	7.631	1.121	0.511	0.057

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT)

Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

Table 2. Broadleaf weed control in lima beans after treating with various PRE and POST herbicide treatments at Paterson, WA in 2006.

Weed Code			SOLSA	SOLSA	SOLSA	SOLNI	SOLNI	CHEAL	CHEAL	CHEAL
Rating Data Type			Hairy n.s.	Hairy n.s.	Hairy n.s.	Black n.s.	Black n.s.	Lambsquar	Lambsquar	Lambsquar
Rating Date			Control	Control	Control	Control	Control	Control	Control	Control
			7/3/06	7/10/06	7/24/06	7/10/06	7/24/06	7/3/06	7/10/06	7/24/06
Trt	Treatment	Rate Unit								
1	Dimethenamid (Outlook)	0.66 lb ai/a	85.94 c	93.00 c	89.00 d	99.00 a	99.00 ab	92.00 d	92.50 b	90.00 c
2	Metolachlor (Dual II Mag)	1.3 lb ai/a	93.75 b	95.00 bc	93.00 cd	96.75 b	96.00 c	92.75 cd	91.75 b	91.75 bc
3	Metolachlor (Dual II Mag)	1 lb ai/a	99.50 a	99.75 a	99.50 ab	99.25 a	99.50 ab	99.50 a	99.50 a	99.25 ab
	Imamox (Raptor)	0.03 lb ai/a								
	Bentazon (Basagran)	1 lb ai/a								
	NIS (R-11)	0.25 % v/v								
4	Metolachlor (Dual II Mag)	1 lb ai/a	99.50 a	99.25 a	97.75 ab	100.00 a	100.00 a	95.25 bcd	92.00 b	90.25 c
	Fomesafen (Reflex)	0.125 lb ai/a								
	NIS (R-11)	0.25 % v/v								
5	Metolachlor (Dual II Mag)	1 lb ai/a	98.75 a	97.75 ab	95.25 bc	100.00 a	100.00 a	96.25 abc	91.00 b	87.00 c
	Fomesafen (Reflex)	0.188 lb ai/a								
	NIS (R-11)	0.25 % v/v								
6	Metolachlor (Dual II Mag)	1 lb ai/a	99.75 a	97.50 ab	97.25 abc	100.00 a	100.00 a	98.00 ab	91.00 b	91.25 bc
	Fomesafen (Reflex)	0.25 lb ai/a								
	NIS (R-11)	0.25 % v/v								
7	Metolachlor (Dual II Mag)	1 lb ai/a	99.25 a	99.75 a	99.50 ab	99.25 a	97.50 bc	93.00 cd	93.50 ab	91.50 bc
	Chloransulam (Firstrate)	0.0156 lb ai/a								
	NIS (R-11)	0.25 % v/v								
8	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	99.50 a	99.00 ab				
	Bentazon (Basagran)	1 lb ai/a								
	NIS (R-11)	0.25 % v/v								
9	Weedy check		0.00 d	0.00 d	0.00 e	0.00 c	0.00 d	0.00 e	0.00 c	0.00 d
10	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a	100.00 a				
	Handweeded									
LSD (P=.05)			4.458	3.506	4.073	1.554	2.025	3.822	6.084	7.498

Weed Code			AMAPO	AMAPO	AMAPO
Rating Data Type			Pigweed	Pigweed	pigweed
Rating Date			Control	Control	Control
			7/3/06	7/10/06	7/24/06
Trt	Treatment	Rate Unit			
No.	Name	Rate Unit	4	9	14
1	Dimethenamid (Outlook)	0.66 lb ai/a	93.50 b	95.50 c	92.75 b
2	Metolachlor (Dual II Mag)	1.3 lb ai/a	97.75 ab	96.25 bc	95.75 ab
3	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a
	Imamox (Raptor)	0.03 lb ai/a			
	Bentazon (Basagran)	1 lb ai/a			
	NIS (R-11)	0.25 % v/v			
4	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a
	Fomesafen (Reflex)	0.125 lb ai/a			
	NIS (R-11)	0.25 % v/v			
5	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a
	Fomesafen (Reflex)	0.188 lb ai/a			
	NIS (R-11)	0.25 % v/v			
6	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a
	Fomesafen (Reflex)	0.25 lb ai/a			
	NIS (R-11)	0.25 % v/v			
7	Metolachlor (Dual II Mag)	1 lb ai/a	98.25 ab	99.00 ab	97.75 ab
	Chloransulam (Firstrate)	0.0156 lb ai/a			
	NIS (R-11)	0.25 % v/v			
8	Metolachlor (Dual II Mag)	1 lb ai/a	98.00 ab	98.00 abc	97.75 ab
	Bentazon (Basagran)	1 lb ai/a			
	NIS (R-11)	0.25 % v/v			
9	Weedy check		0.00 c	0.00 d	0.00 c
10	Metolachlor (Dual II Mag)	1 lb ai/a	100.00 a	100.00 a	100.00 a
	Handweeded				
LSD (P=.05)			4.522	3.168	4.693

Means followed by same letter do not significantly differ (P=.05, Duncan's New MRT).