

Project Number: 13K 3419 5228

Title: Weed control in green peas

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Reporting Period: 2002-03

Accomplishments:

Eight herbicides alone and in various combinations were tested for crop safety in green peas. A total of thirty treatments were applied.

Results:

Two studies were conducted in 2002: (1) reduced rate, combination treatment study, and (2) a new herbicide test of Spartan and Valor alone or in combination with Dual Magnum or Prowl. In both trials, weed control and yield parameters were measured. Peas were also tested for Sandea (halosulfuron) carryover sensitivity in three cucumber trials.

1. Green peas were planted May 6, 2002 at WSU Mount Vernon. Herbicides were applied May 7 (PRE) and June 6 (POST). Weed control and crop injury was evaluated June 6 and July 15. Pea plants within a randomly placed 1-m² quadrat in each plot were pulled from the soil July 29 and 30. These plants were counted and pods containing harvestable peas stripped and counted. From those pods, 100 pods were randomly selected and opened, and peas weighed. Total pea yield for each plot was then calculated. The experimental design was a randomized complete block with four replicates. Results are included in Tables 1 and 2.

Peas treated with the full rates of Command + Basagran, full or half rate of Sencor (PRE), or full rate of Sencor (POST) provided excellent weed control and were top yielders. Combinations of Command with Sencor (either PRE or POST) were also excellent. The half rate of Command was marginal in weed control and yield, as was the half rate of Sencor (POST). Sencor (PRE) with either Basagran or MCPA gave fairly good weed control, but fairly poor pea yield. Weed control was poor with Sencor (POST) + MCPA, but yield was fairly good. All other treatments failed in weed control and yields were correspondingly reduced.

2. Green peas were planted May 6, 2002 at WSU Mount Vernon. Herbicides were applied May 8 (PRE). Weed control and crop injury were visually evaluated May 24 and June 6. Pea plants within a randomly placed 1-m² quadrat in each plot were pulled from the soil July 29 and 30. These plants were counted and pods containing harvestable peas stripped and counted. From those pods, 100 pods were randomly selected and opened, and peas weighed. Total pea yield for each plot was then calculated. The experimental design was a split plot, randomized complete block with four replicates. The main effect was herbicide formulation/rate and the split effect was pea variety. Results are included in Tables 3 and 4.

Early pea injury from Valor was generally higher than for Spartan, particularly for 'Snake' as compared to 'Charo'. All Valor applications caused significant yellowing and stunting of 'Snake' by May 24 compared to nontreated peas. Symptoms from most treatments persisted though June 6. Pea population did not vary due to herbicide treatment for either variety at harvest. Control of the two *Polygonum* weed species (POLXX) was excellent from all Valor treatments at the June evaluation, but Spartan was not as active on POLXX, and only mixtures with Prowl or Dual Magnum adequately controlled that weed complex. Control of CHEAL in early June was excellent with all treatments. Maximal pea yields were achieved with all Valor treatments or with Spartan + Prowl; all other treatments yielded significantly lower than the optimal treatment (3.6 T/a for Valor + Prowl in 'Snake' and 3.1 T/a for Valor at 0.03 lb/a in 'Charo').

Table 1. Weed control on pea yield from several herbicides at full and reduced rates.

Treatment	Timing ^a	Rate	Grass	Brdlf.	Pods	Pea
			control	control	plant	yield
		product/a	%	%		ton/a
Command	PRE	10.7 fl.oz	80	97	4.8	3.4
Command	PRE	5.3 fl.oz	80	76	4.9	2.7
Sencor	PRE	5.3 oz	93	99	7.2	4.3
Sencor	PRE	2.7 oz	85	99	5.0	3.2
Sencor	POST	2.7 oz	64	92	5.0	3.0
Sencor	POST	1.3 oz	40	60	4.0	2.3
Basagran	POST	1 ½ pt	28	58	3.3	1.7
Basagran	POST	3/4 pt	40	55	3.8	1.5
MCPA	POST	4 fl.oz	35	23	3.3	1.5
MCPA	POST	2 fl.oz	50	10	3.3	1.6
Command + Sencor	PRE + PRE	2.7 fl.oz + 1.3 oz	79	99	6.1	3.9
Command + Sencor	PRE + POST	2.7 fl.oz + 0.7 oz	74	98	6.0	3.8
Command + Basagran	PRE + POST	2.7 fl.oz + 2/3 pt	50	79	4.0	2.0
Command + MCPA	PRE + POST	2.7 fl.oz + 1 fl.oz	49	71	4.0	1.9
Sencor + Basagran	PRE + POST	1.3 oz + 2/3 pt	60	94	4.4	2.4
Sencor + Basagran	POST + POST	0.7 oz + 2/3 pt	40	66	3.7	2.0
Sencor + MCPA	PRE + POST	1.3 oz + 1 fl.oz	71	88	4.2	2.4
Sencor + MCPA	POST + POST	0.7 oz + 1 fl.oz	38	55	3.5	2.2
Basagran + MCPA	POST + POST	1/3 pt + 1 fl.oz	45	40	3.1	1.5
Command + Basagran	PRE + POST	10.7 fl.oz + 1 ½ pt	88	99	6.3	4.2
Untreated	—	—	0	0	2.9	1.2
LSD _{0.05}	—	—	21	17	1.6	1.3

^aPRE = preemergence; POST = postemergence.

Table 2. Crop injury and weed control from several new herbicides in green peas.

Treatment	Timing ^a	Rate	Crop injury		Grass control		Brdlf. control	
			5/24	6/22	5/24	6/22	5/24	6/22
			lb ai/a	%	%	%	%	%
1. Axiom	PRE	0.75	5	8	95	98	99	94
2. Broadstrike	PRE	0.055	28	28	65	36	99	92
3. Broadstrike	PRE	0.5	20	15	55	51	100	96
+ Sonalan	PRE	+ 0.03						
4. Prowl	PRE	0.5	1	5	80	79	100	99
+ Outlook	PRE	+ 0.64						
5. Dual Magnum	PRE	0.64	0	4	75	84	100	98
+ Sencor	PRE	+ 0.15						
6. Lasso	PRE	2	1	5	89	96	98	89
7. Prowl	PRE	0.75	0	0	13	23	100	99
8. Spartan	PRE	0.15	18	4	78	92	100	97
+ Sencor	PRE	+ 0.1						
9. Cobra	POST	0.05	—	5	—	23	—	84
+ Basagran	POST	+ 0.25						
10. Axiom	POST	0.5	—	6	—	97	—	96
11. Raptor	POST	0.032						
+ Basagran	POST	+ 0.25						
+ 32-0-0	POST	+ 1%	—	0	—	100	—	77
12. Staple	POST	0.0638	—	45	—	41	—	74
13. Untreated	—	—	0	0	0	0	0	0
LSD _{0.05}	—	—	7	13	21	29	2	14

^aPRE = preemergence; POST = postemergence.

Table 3. Pea injury and weed control following application of various herbicides (2002).

Treatment	Rate lb ai/a	Pea injury				Weed control (June 6)	
		'Snake'		'Charo'		CHEAL ^a	POLXX ^b
		May 24	June 6	May 24	June 6	%	
Flumioxazin	0.03	8	3	5	3	100	98
Flumioxazin	0.047	10	1	3	4	100	98
Flumioxazin	0.06	16	8	13	8	100	100
Flumioxazin + Pendimethalin	0.03 + 0.75	8	1	3	3	100	100
Flumioxazin + s-metolachlor	0.03 + 1.0	10	4	8	5	100	100
Sulfentrazone	0.094	0	0	0	0	100	82
Sulfentrazone	0.125	3	1	3	1	100	82
Sulfentrazone	0.188	5	1	3	4	100	87
Sulfentrazone + Pendimethalin	0.094 + 0.75	1	0	0	0	100	99
Sulfentrazone + s-metolachlor	0.094 + 1.0	9	1	4	5	100	95
Untreated	—	0	0	0	0	0	0
LSD _{0.05}	—	6	3	6	4	ns	5

^aCHEAL = *Chenopodium album* (common lambsquarters).

^bPOLXX = combination of *Polygonum lapathifolium* (pale smartweed) and *P. persicaria* (ladysthumb).

Table 4. Pea yield measurements following treatment with various herbicides (2002).

Treatment	Rate	'Snake'			'Charo'		
		Pop.	Pods	Yield	Pop.	Pods	Yield
	lb ai/a	pl./a	Pods/pl.	tons/a	pl./a	Pods/pl.	tons/a
Flumioxazin	0.03	2.71	3.1	2.5	2.57	4.9	3.1
Flumioxazin	0.047	3.28	3.0	3.1	2.25	5.9	2.6
Flumioxazin	0.06	2.69	3.7	3.2	2.37	4.7	3.0
Flumioxazin + Pendimethalin	0.03 + 0.75	2.78	3.8	3.6	2.74	4.4	2.4
Flumioxazin + s-metolachlor	0.03 + 1.0	2.82	3.1	2.7	2.22	4.5	2.4
Sulfentrazone	0.094	2.57	2.2	1.4	2.77	3.7	2.2
Sulfentrazone	0.125	3.16	1.9	1.6	2.44	3.3	1.8
Sulfentrazone	0.188	2.72	2.7	2.0	2.08	3.1	1.5
Sulfentrazone + Pendimethalin	0.094 + 0.75	2.88	3.3	3.0	2.80	4.3	2.7
Sulfentrazone + s-metolachlor	0.094 + 1.0	2.89	2.5	2.1	2.61	3.6	2.1
Untreated	—	2.67	1.2	0.6	2.36	2.8	1.2
LSD _{0.05}	—	ns	0.9	0.9	ns	1.3	0.8