

Project Number: 13K 3419 6228

Title: Weed control in cucumbers

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Reporting Period: 2001-2002

Accomplishments:

1. Gowan Co. registered Sandea (halosulfuron) herbicide for use in cucumbers, due in large part to data provided from the weed science program at WSU Mount Vernon.
2. Ten herbicides were tested this year for crop safety in cucumbers. A total of twenty-two treatments were applied. In addition, data was generated regarding injury to rotational crops resulting from Sandea carryover in soil. Finally, using cover crops immediately prior to cucumbers resulted in either inadequate weed control or unacceptably low cucumber establishment.

Results:

Three studies were completed in 2001: an advanced testing herbicide trial, a Sandea carryover trial, and a cover cropping trial. For all trials, the cucumber cultivar 'Calypso' was seeded in early July, 2001.

Most treatments in the advanced test caused slight (less than 10%) injury to cucumber, but several POST treatments caused 30% or more injury (Dual Magnum, Sandea, Outlook, and Prowl). A PRE treatments with these products also caused moderate injury at treated rates, but may still be good candidates at lower rates. Strategy (pre-packaged mix of Curbit + Command) applied PRE looked good in this trial. Crop injury, weed control, and yield information is in Table 1.

Sandea was applied at 0.5X, X, 1.5X, and 2X (X = 1 oz product/a, highest labeled use rate), incorporated, and plots seeded to several rotational crops. Beets, spinach, and cauliflower were severely injured or killed at all rates, while potatoes and peas were moderately injured (Table 2a). Cucumbers were not significantly injured, even at the 2X rate. A second rotational crop planting into these residuals is still being evaluated. Plots will be replanted/maintained through fall of 2002.

Appendix. Data tables.

Table 1. Injury to and yield of cucumbers and weed control after treatment with various herbicides and herbicide combinations.

Treatment	Timing ^a	Rate product/a	Crop injury ^b	Weed control		Cuke yield tons/a	Yield per plant ^c	
				8/8	9/20		no.	wt. kg
1. Prowl	PRE	1.8 pt	19	85	63	16.8	2.1	0.16
2. Gallery	PRE	6.4 oz	5	46	39	14.2	1.8	0.10
3. Outlook	PRE	1/4 pt	24	56	38	13.1	1.8	0.10
4. Dual Magnum	PRE	1/3 pt	5	63	40	13.3	1.9	0.10
5. Command + Prowl	PRE	1/3 pt 1.8 pt	30	94	80	14.1	1.7	0.11
6. Command + Gallery	PRE	1/3 pt 6.4 oz	5	81	71	16.9	1.9	0.11
7. Command + Outlook	PRE	1/3 pt 1/4 pt	14	91	71	16.7	1.8	0.11
8. Command + Dual Magnum	PRE	1/3 pt 1/3 pt	19	85	68	13.4	1.7	0.10
9. Command + Sanda	PRE	1/3 pt 1/2 oz	6	97	86	18.3	2.0	0.12
10. Command + Kerb	PRE	1/3 pt 2 lbs	11	94	89	16.9	2.1	0.12
11. Command + Starane	PRE	1/3 pt 1 1/3 pt	4	97	83	17.1	1.6	0.11
12. Command + Curbit	PRE	1/3 pt 2 pts	3	86	69	17.2	2.2	0.12
13. Command + Outlook	PRE	1/3 pt 2 fl.oz	31	78	41	13.7	1.8	0.10
14. Command + Dual Magnum	PRE	1/3 pt 1/4 pt	38	85	56	9.2	1.6	0.06
15. Command + Sanda + nis	PRE POST POST	1/3 pt 1/3 oz 0.25%	35	99	91	6.6	1.7	0.05
16. Command + Basagran	PRE POST	1/3 pt 1/2 pt	15	96	81	14.2	2.0	0.10
17. Strategy	PRE	1 pt	9	96	88	17.8	1.9	0.11
18. Strategy	PRE	2 pts	1	80	54	19.3	2.2	0.12
19. Strategy	PRE	3 pts	9	90	76	18.3	2.1	0.12
20. Strategy	PRE	4 pts	10	93	75	20.0	1.9	0.13
21. handweeded	—	—	4	99	98	19.3	2.1	0.13
22. weedy	—	—	0	15	0	13.5	1.6	0.09
LSD _{0.05}	—	—	10	22	31	4.4	0.4	0.03

^aPRE = preemergence to weeds, applied 7/10/99; POST1 = postemergence, applied 7/19/99.

^bOn this date, postemergence treatments at 2-4 leaves had not yet been applied.

^cCucumbers harvested 9/28/99.

Table 2a. Crop injury and biomass of several rotational crops immediately after treatment with halosulfuron (Sandea).

Rotational crop	Crop injury						Dry weight of foliage					
	Check	Herbicide rate (oz product)				LSD _{0.05}	Check	Herbicide rate (oz product)				LSD _{0.05}
		0.5	1.0	1.5	2.0			0.5	1.0	1.5	2.0	
		%					g					
Cucumber	5	6	6	9	10	ns	36	35	38	31	30	ns
Spinach	0	84	83	88	88	6	34	>1	>1	>1	>1	10
Table beet	0	93	94	95	95	2	14	>1	>1	>1	>1	3
Cauliflower	0	94	91	97	96	4	10	>1	>1	>1	>1	2
Pea	0	53	60	65	78	21	16	10	7	8	5	5
Potato	0	20	59	90	98	16	29	17	12	7	5	9

Table 2b. Rotational crop herbicide application data.

Preemergence	Preemergence
9:30 a.m., 7/13/01	10:30 a.m., 9/12/01
Broadcast	Broadcast
100% overcast	100% overcast
Winds 3 to 5 mph from S	Winds 4 to 7 mph from N
Air temp. = 60 F; soil temp (4") = 63 F	Air temp. = 72 F; soil temp (4") = 60 F
Dew not present, soil surface was dry	Dew not present, soil surface was dry

Table 2c. Rotational crops and maintenance herbicides.

Rotational crop	Treatment	Rate	Timing
		lb ai/a	
Cucumber	Command	0.125	PRE
Spinach	Pyramin	1.0	PRE
Table beet	Pyramin	1.0	PRE
Cauliflower	Devrinol	1.0	PRE
Pea	Sencor	0.2	PRE
Potato	Sencor + Matrix	0.5 + 0.02	PRE