Project Number: 13K 3419 6228

Title: Weed control in cucumbers.

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Reporting Period: 2008-09

Accomplishments: Two cucumber studies were conducted in 2008, a stale seedbed trial and a new herbicide trial. Nine herbicides and flaming were tested for crop safety in cucumbers at different treatment timings; a total of 112 treatments were applied this season.

Results:

Stale seedbed trial. Pickling cucumber (cv. 'Calypso') was seeded at WSU Mount Vernon NWREC July 10 into strips of land that had been prepared for seeding at fourteen, seven, or three days prior to the seeding date. A check strip was also seeded into a freshly-prepared seedbed (zero days prior to seeding). Herbicides were applied July 15 immediately prior to cucumber cotyledon emergence, but postemergence to many weed seedlings. Residual herbicides were then applied to aid in mid- to late-season weed control. Cucumber emergence and weed control was estimated October 2 (end of season). Cucumber vines and weeds from 1-m^2 sections in the center of each plot were separated at harvest maturity and fresh weight was determined. The experimental design was a split-block, randomized complete block with four replicates.

Nearly every treatment resulted in excellent weed control this season (Table 1). Even when no PRE or residual herbicide was used, resultant weed control averaged 94% across the four different stale seedbed timings (data not shown). Cucumber vine and fruit weight was maximized when cucumbers were seeded after 0 or 3 days. Gramoxone reduced vine and fruit weight compared to other PRE herbicide. There were no differences in vine and fruit weight between the residual herbicides tested, nor did those herbicides result in more vine and fruit production than non-treated cucumber plants. There was no difference in weed biomass for stale seedbed timing, PRE herbicide, or residual herbicide. Based on these data, it appears that when cucumbers are planted late in the season, weed growth is minimized and herbicides or flame is not necessary for successful cucumber productivity.

New herbicide trial. Pickling cucumber (cv. 'Calypso') was seeded at WSU Mount Vernon NWREC July 3 and herbicides were applied preemergence (PRE) July 8-9 and POST August 7. Cucumber injury and weed control was estimated October 2 (end of season). Cucumber plants from 1-m^2 sections in the center of each plot were counted September 16-17, and the number and fresh weight of cucumber fruit was recorded. The experimental design was a randomized complete block with four replicates.

None of the herbicides caused significant crop injury (data not shown). Weed control from most treatments was good to excellent, eight treatments resulting in weed control that exceeded 84% in early October (Table 2). Fruit number and weight did not differ significantly among the treatments, while nine treatments produced an equivalent of 12.5 tons/a. Valent #1 and Valent #2 used alone at tested rates did not enhance weed control from the untreated check in this trial (a range from 75 to 80% weed control for both products applied either PRE or POST). Yield parameters from cucumbers treated PRE with Valent #1, however, was among the top yielders. These data indicate that Valent #1 and #2 offer some promise for weed control in cucumbers, particularly when combined with other products. Based on these data, additional testing with these products at higher rates is warranted in 2009.

Table 1. Effect of stale seedbed on weed control from several herbicides applied immediately prior to cucumber emergence (2008).

Treatment	Rate	Weed rating	Cuke vine fresh weight	Weed fresh weight
Stale seedbed	product/a	%	kg/plot	kg/plot
14 days	---	97 ab	21.93 b	7.68
7 days	---	98 a	21.94 b	7.67
3 days	---	97 ab	23.04 a	7.70
0 days	---	96 b	23.48 a	7.58
PRE herbicide				
Roundup	2 pt	97 a	22.45 b	7.38
Gramoxone	2.4 pt	97 a	18.52 c	7.54
Rely	4 pt	98 a	23.69 ab	7.81
ET	2.5 fl.oz	98 a	23.59 ab	7.64
Flame	---	95 b	23.16 ab	7.71
None	---	97 a	24.09 a	7.85
Residual herbicide				
Command	5.3 fl.oz	98 b	22.59	7.86
Curbit	2.7 pt	96 c	22.91	7.77
Sandea	0.5 oz	99 a	22.17	7.58
None	---	96 c	22.72	7.41

Peas planted July 1; herbicides or flame applied July 6 (PRE to crop, POST to weeds).

Table 2. Effect of herbicide treatment on cucumber growth and weed control (2008).

Treatment	Rate	Timing	Weed control[a]	Fruit number	Fruit weight	Yield
	product/a		%	no./plant	g/fruit	tons/a
Valent #1	8.5 oz	PRE	80 bcd	2.1	48	13.8 a-c
Valent #1 + Command	8.5 oz + 5.3 fl.oz	PRE + PRE	81 bcd	2.0	48	12.7 a-e
Valent #1 + Sandea	8.5 oz + 0.5 oz	PRE + PRE	96 a	2.0	50	13.7 a-c
Valent #1 + Curbit	8.5 oz + 2.7 pt	PRE + PRE	81 bcd	2.1	50	13.3 a-d
Valent #2	3.8 oz	PRE	76 cd	2.0	42	9.6 ef
Valent #2 + Command	3.8 oz + 5.3 fl.oz	PRE + PRE	86 abcd	2.5	51	13.8 a-c
Valent #2 + Sandea	3.8 oz + 0.5 oz	PRE + PRE	96 a	2.2	53	14.9 a
Valent #2 + Curbit	3.8 oz + 2.7 pt	PRE + PRE	86 abcd	2.1	51	14.6 ab
Valent #1	4.3 oz	POST	75 d	2.0	39	11.0 c-f
Command + Valent #1	5.3 fl.oz + 4.3 oz	PRE + POST	84 abcd	1.9	41	10.9 c-f
Sandea + Valent #1	0.5 oz + 4.3 oz	PRE + POST	90 ab	1.8	49	12.5 a-f
Curbit + Valent #1	2.7 pt + 4.3 oz	PRE + POST	89 abc	2.1	41	11.2 b-f
Valent #2	1.9 oz	POST	78 bcd	1.7	44	9.1 f
Command + Valent #2	5.3 fl.oz + 1.9 oz	PRE + POST	79 bcd	1.8	43	10.1 d-f
Sandea + Valent #2	0.5 oz + 1.9 oz	PRE + POST	90 ab	1.8	45	10.8 c-f
Curbit + Valent #2	2.7 pt + 1.9 oz	PRE + POST	80 bcd	1.7	46	10.7 c-f
Weedy	---	---	75 d	1.8	49	13.3 a-d

Means followed by the same letter are not significantly different ($P < 0.05$). Peas planted June 20; herbicides applied June 24 (PRE) and July 10 (POST); peas harvested August 26-28.

[a]Weed control rated September 2, 2008 (end of season).