

Project Number: 13K 3419 6228

Title: Weed control in cucumbers.

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Reporting Period: 2009-10

Accomplishments: Two cucumber studies were conducted in 2009, 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 was seeded at WSU Mount Vernon NWREC June 4 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). Residual herbicides were applied June 6 and contact herbicides were applied June 8, immediately prior to cucumber shoot emergence, but POST to many weed seedlings. Cucumber injury and weed control was estimated July 28. Pea vines and weeds from 1-m² sections in the center of each plot were separated at harvest maturity and fresh weight was determined August 5-6. The experimental design was a split-split-block, randomized complete block with four replicates.

There were no significant differences in cucumber injury resulting from any treatment in this trial (Table 2). Weed control was reduced in the fourteen day seedbed and was enhanced with Roundup, ET, or flame compared to plots not receiving a “contact” or residual herbicide treatment. Weed biomass for greatest in stale seedbeds of fourteen days. All “contact” herbicides reduced weed biomass significantly, while Curbit and Sandea performed better than Command. 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. Based on these data, it appears that cucumbers compete well with weeds when early weed growth is controlled. Stale seedbeds may offer cucumber producers another option to enhance weed control, and flame offers an option for organic producers to improve weed control and cucumber productivity.

New herbicide trial. Pickling cucumber was seeded at WSU Mount Vernon NWREC May 28 and herbicides were applied preemergence (PRE) May 30 and POST June 30. Cucumber injury and weed control was estimated July 27. Cucumber plants from 1-m² sections in the center of each plot were counted July 31, and the number and fresh weight of cucumber fruit was recorded. The experimental design was a randomized complete block with four replicates.

Valent #2 applied alone or in combination POST were the only treatments that caused significant crop injury, with foliar injury ranging from 11 to 19% at harvest (Table 2). Weed control from most treatments was excellent, with fifteen of sixteen treatments resulting in greater than 88% weed control by late July. 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). Fruit number and yield did not differ significantly among Valent #1 and #2 PRE treatments and combinations, although all Valent #2 POST treatments displayed lowered yield parameters. Fruit number per plant was generally reduced by Valent #2 treatments and combinations, however, indicating that perhaps some crop injury resulted from those treatments even if it wasn't visible. These data indicate that Valent #1 and #2 PRE continue to offer promise for weed control in cucumbers, particularly when combined with other products. Based on these data, additional testing with these products is warranted in 2009.

Table 1. Effect of stale seedbed on weed control from several herbicides applied immediately prior to cucumber emergence (2009).

Treatment	Rate	Crop injury ^a	Weed rating ^a	Average cucumber vine fresh weight ^b	Cucumber vine fresh weight ^b	Weed fresh weight ^b
<u>Stale seedbed</u>	product/a	%	%	g/plant	kg/plot	g/plot
14 days	---	7	85 b	233	6.23	331 a
7 days	---	6	93 a	242	6.87	126 b
3 days	---	6	94 a	240	6.65	98 b
0 days	---	6	92 a	235	6.67	178 b
<u>PRE herbicide</u>						
Roundup	2 pt	6	94 a	251	7.04	107 b
Gramoxone	2.4 pt	6	90 bc	236	6.60	147 b
Rely	4 pt	6	93 ab	243	6.74	162 b
ET	2.5 fl.oz	6	90 bc	228	6.35	160 b
Flame	---	6	93 ab	233	6.73	104 b
None	---	7	87 c	220	6.14	428 a
<u>Residual herbicide</u>						
Command	5.3 fl.oz	6	90 ab	234	6.70	225 ab
Curbit	2.7 pt	7	92 a	238	6.66	129 bc
Sandea	0.5 oz	6	92 a	232	6.58	95 c
None	---	6	89 b	236	6.48	288 a

Cucumbers planted June 4, 2009; PRE herbicides applied June 8, 2009 (PRE to crop, POST to weeds); residual herbicides applied June 6, 2009.

^aCrop injury and weed control rated July 31, 2009.

^bCucumber vines and weeds harvested August 5-6, 2009.

Table 2. Effect of herbicide treatment on cucumber growth and weed control (2009).

Treatment	Rate	Timing	Crop injury	Weed control ^a	Fruit number ^b	Fruit weight ^b	Yield ^b
	product/a		%	%	no./plant	g/fruit	tons/a
Valent #1	8.5 oz	PRE	1 c	91 a	1.8 abc	80 cde	19.2 ab
Valent #1 + Command	8.5 oz + 5.3 fl.oz	PRE + PRE	0 c	89 ab	1.8 a-d	76 cde	19.0 abc
Valent #1 + Sandea	8.5 oz + 8.1 oz	PRE + PRE	3 c	98 a	1.9 ab	73 de	18.5 abc
Valent #1 + Curbit	8.5 oz + 2.7 pt	PRE + PRE	5 c	89 ab	2.0 a	74 de	18.4 a-d
Valent #2	3.8 oz	PRE	1 c	95 a	1.6 c-g	97 ab	19.6 ab
Valent #2 + Command	3.8 oz + 5.3 fl.oz	PRE + PRE	5 c	88 ab	1.5 efg	102 a	20.1 a
Valent #2 + Sandea	3.8 oz + 8.1 oz	PRE + PRE	3 c	94 a	1.6 b-g	91 abc	20.2 a
Valent #2 + Curbit	3.8 oz + 2.7 pt	PRE + PRE	3 c	91 a	1.7 b-f	90 abc	19.9 a
Valent #1	4.3 oz	POST	1 c	93 a	1.8 a-d	78 cde	17.9 a-e
Command + Valent #1	5.3 fl.oz + 4.3 oz	PRE + POST	4 c	96 a	1.7 a-e	86 bcd	19.9 a
Sandea + Valent #1	8.1 oz + 4.3 oz	PRE + POST	4 c	96 a	1.7 a-e	77 cde	18.1 a-d
Curbit + Valent #1	2.7 pt + 4.3 oz	PRE + POST	3 c	98 a	1.8 abc	86 b-e	20.0 a
Valent #2	1.9 oz	POST	16 ab	76 bc	1.4 fg	85 b-e	15.0 f
Command + Valent #2	5.3 fl.oz + 1.9 oz	PRE + POST	11 b	88 ab	1.5 d-g	78 cde	15.7 def
Sandea + Valent #2	8.1 oz + 1.9 oz	PRE + POST	16 ab	93 a	1.5 d-g	84 b-e	16.4 c-f
Curbit + Valent #2	2.7 pt + 1.9 oz	PRE + POST	19 a	91 a	1.4 g	81 cde	15.4 ef
Weedy	---	---	1 c	70 c	1.8 a-d	71 e	17.0 b-f

Means followed by the same letter are not significantly different ($P < 0.05$). Cucumbers planted May 28, 2009; herbicides applied May 30 (PRE) and June 30, 2009 (POST).

^aWeed control rated July 27, 2009.

^bCucumbers harvested July 31, 2009.