

Project Number: 13K 3419 6228

Title: Weed control in cucumbers.

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Reporting Period: 2007-08

Accomplishments: Two cucumber studies were conducted in 2007, a stale seedbed trial and a new herbicide trial. Eight herbicides were tested for crop safety in cucumbers at different treatment timings; a total of 35 treatments were applied this season.

Results: Results will be presented at the Western Washington Horticultural Association meeting in January, 2008.

Stale seedbed trial. Pickling cucumber (cv. 'Calypso') was seeded at WSU Mount Vernon NWREC June 6 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 June 11 immediately prior to cucumber cotyledon emergence, but POST to many weed seedlings. Cucumber emergence and weed control was estimated June 26 (2 weeks after treatment (WAT)) and August 14 (9 WAT). Due to large numbers of weeds in the plots by August, cucumber fruits were not harvested. The experimental design was a split-block, randomized complete block with four replicates.

Herbicides and flame provided improved weed control at 2 WAT compared to no treatment at all stale seedbed timings, except for the 3-day seedbed (Table 1). In that timing, ET and flame were statistically similar to no control.

Overall, however, there was little difference between treatments at 2 WAT, indicating that all provided a degree of weed control. By August, however, no treatments were continuing to provide appreciable weed control (44% or less weed control, compared to non-treated plots seeded at 14 days). Best control at that time was from treatments applied to a 14-day stale seedbed. Due to poor weed control from all treatments, plots were not harvested.

New herbicide trial. Pickling cucumber (cv. 'Calypso') was seeded at WSU Mount Vernon NWREC June 13 and herbicides were applied preemergence (PRE) June 15 and POST July 14. Cucumber injury and weed control was estimated June 26 (2 WAT) and August 14 (9 weeks after PRE treatment, 4 weeks after POST treatment). Cucumber plants from 1-m sections of all rows were counted August 14, and fresh weight and number of cucumber fruit was recorded. The experimental design was a randomized complete block with four replicates.

Crop injury from PRE treatments by Jun 26 was slight, ranging from 3 to 5% (Table 2). Cucumbers had completely recovered from PRE treatments by the August evaluation. POST treatments caused severe and lasting damage to cucumbers. Weed control from PRE treatments was good to excellent, ranging from 83 to 98% by 2 WAT, but was unacceptably low for most products by the August evaluation. The Valent #1 product, however, was still giving 79 to 88% weed control at that time. Weed control with POST products was good to excellent, but given the severe injury, these products do not appear to be promising for further evaluation. Yield parameters from cucumbers treated PRE were equivalent or significantly better than from weedy cucumbers. Valent #1 may offer some promise, provided the company is interested in further testing of this experimental compound. Cucumbers treated with Everest or Granite PRE yielded well, although it would have to be augmented with other herbicides in tank mixture or in sequence. POST products and Valent #2 PRE resulted in significantly poorer yield than the highest yielding treatments.

Table 1. Effect of stale seedbed on weed control from several herbicides applied immediately prior to cucumber emergence (2007).

Treatment	Rate	Weed rating (June 26, 2 WAT)				Weed rating (August 14, 9 WAT)			
		0 days	3 days	7 days	14 days	0 days	3 days	7 days	14 days
	Product/a	%	%	%	%	%	%	%	%
Roundup	2 pt	89 c	93 ab	93 ab	88 c	24 cd	5 fg	29 bc	23 cd
Gramoxone	2.4 pt	94 ab	94 ab	91 bc	93 ab	21 de	8 ef	33 b	35 b
Rely	4 pt	93 ab	93 ab	93 ab	91 bc	21 de	13 ef	35 b	44 a
ET	2.5 fl.oz	89 c	91 bc	91 bc	89 c	25 cd	15 e	24 cd	21 de
Flame	---	91 bc	91 bc	95 a	84 d	15 e	8 ef	34 b	34 b
None	---	84 d	89 c	70 e	0 f	0 g	9 ef	5 fg	0 g

Means followed by the same letter are not significantly different ($P < 0.05$). Cucumbers planted June 6; herbicides applied June 11 (POST to weeds, PRE to crop).

Table 2. Effect of herbicide treatment on cucumber growth and weed control (2007).

Treatment	Rate	Timing	Crop injury		Weed control		Fruit number	Fruit weight	Yield
			Jun 26	Aug 14	Jun 26	Aug 14			
	Product/a		%	%	%	%	no./plant	g/fruit	tons/a
Everest	0.3 oz	PRE	3 ab	0 c	97 a	40 d	2.2 ab	39 ab	7.8 a
Everest	0.6 oz	PRE	3 ab	0 c	98 a	61 bcd	2.0 b	39 ab	7.9 a
Granite	1.4 fl.oz	PRE	5 a	0 c	97 a	69 abc	2.1 ab	36 b	6.5 ab
Valent #1	4.3 oz	PRE	4 ab	0 c	97 a	79 ab	2.4 a	33 b	7.2 a
Valent #1	8.5 oz	PRE	4 ab	0 c	97 a	88 ab	2.2 ab	33 b	7.2 a
Valent #2	2.7 oz	PRE	3 ab	0 c	83 b	45 cd	1.5 c	36 b	5.4 bc
Valent #2	5.3 oz	PRE	3 ab	3 c	89 b	49 cd	1.5 cd	29 b	4.0 c
Everest	0.3 oz	POST	---	44 b	---	84 ab	1.1 de	48 a	4.9 bc
Everest	0.6 oz	POST	---	56 a	---	90 a	0.7 e	36 ab	2.2 d
Granite	1.4 fl.oz	POST	---	46 b	---	88 ab	0.9 e	17 c	1.5 d
Weedy	---	---	0	0	0	0	1.5 c	27 bc	4.0 c

Means followed by the same letter are not significantly different ($P < 0.05$). Cucumbers planted June 13; herbicides applied June 15 (PRE) and July 14 (POST); fruit harvested August 14.