

Project Number: 13K 3419 6228

Title: Weed control in cucurbits

Personnel: Tim Miller and Carl Libbey, WSU NWREC

Reporting Period: 2011-12

Accomplishments: One study was conducted in 2012, a combination stale seedbed and herbicide trial. Seven herbicides and flaming were tested for crop safety in cucumbers at different treatment timings; a total of 96 treatments were applied this season.

Results:

Pickling cucumber, mini-pumpkin, and acorn squash were seeded at WSU Mount Vernon NWREC July 13, 2012 into strips of land that had been prepared for seeding at seven days or three days prior to the seeding date. A check strip was also seeded into a freshly-prepared seedbed (zero days prior to seeding). Four residual herbicides, Command (clomazone), Dual Magnum (s-metolachlor), Sandea (halosulfuron), and Curbit (ethalfluralin) were applied July 15 and two nonselective herbicides, Roundup (glyphosate) and Gramoxone (paraquat), or flame (propane flamer) were applied preemergence (PRE) July 17, immediately prior to cucumber shoot emergence, but postemergence (POST) to many weed seedlings. Crop injury and weed control was estimated August 15. Cucumber vines and weeds from 1-m² sections in the center of each plot were separated at harvest maturity and fresh weight was determined September 7. Squash and pumpkins were harvested in the same manner on October and October, respectively. The experimental design was a split-split-block, randomized complete block with three replicates.

Weed control did not differ by stale seedbed or by nonselective herbicide treatment (Table 1). Flame did not significantly affect weed control as compared to the non-flamed cucurbits. Residual herbicides were uniformly effective, resulting in from 97 to 100% control. There was no significant crop injury from any of the treatments.

Average fruit weight at harvest was the same for all treatments to cucumber, squash, and pumpkin (Table 1). Although not statistically significant, cucumbers tended to be larger when planted in a 0- or 3-day seedbed. Pumpkins tended to be larger in stale seedbeds of 3 days or when planted the same day as final seedbed preparation, while response to herbicide applications wasn't clear. Acorn squash was nonsignificantly larger when treated with Command + Dual Magnum than when treated with other residual products, and there was a trend toward larger fruit when no nonselective products were used, and when seeded into a 3-day stale seedbed.

Total fruit yield (lbs/a) of cucumber, pumpkin, or squash was not affected by stale seedbed or herbicide combinations (Table 2). Fruit number, however, was significantly affected in two cases: (a) in cucumber, a 7-day stale seedbed resulted in a greater number of fruit produced, and (b) number of squash produced was greater when Command was used with Sandea than when used with Curbit or Dual Magnum or when not treated with a residual herbicide.

Table 1. Effect of stale seedbed on weed control and average fruit weight when used with several herbicides applied immediately prior to cucurbit emergence (2012).

Treatment	Rate	Weed control ^a	Average	Average	Average
			cucumber weight ^b	pumpkin weight ^b	squash weight ^b
	product/a	%	g/fruit	g/fruit	g/fruit
Stale seedbed					
7 days	---	98	25.5	193	669
3 days	---	98	26.9	204	690
0 days	---	98	26.5	206	676
Nonselective herbicide					
Roundup	2 pt	98	26.6	204	679
Gramoxone	2.4 pt	98	26.2	201	679
Flame	---	98	26.1	198	699
None	---	98	26.4	200	655
Residual herbicide					
Command + Curbit	5 fl.oz + 2 pt	100 a	25.6	209	712
Command + Dual Magnum	5 fl.oz + 5 fl.oz	100 a	27.7	203	732
Command + Sandea	5 fl.oz + 0.5 oz	97 b	27.2	195	648
Dual Magnum + Curbit	5 fl.oz + 2 pt	100 a	26.0	199	665
Dual Magnum + Sandea	5 fl.oz + 0.5 oz	100 a	25.2	193	650
None	---	90 c	26.3	206	664

Means within a column in each section that are followed by the same letter, or are without letters, are not significantly different ($P < 0.05$). Crop planted July 13, 2012; PRE herbicides applied July 17, 2012 (PRE to crop, POST to weeds); residual herbicides applied July 15, 2012.

^aWeed control estimated August 15, 2012.

^bCucumbers were harvested September 7, 2012; squash and pumpkins were harvested October 24-25, 2012.

Table 2. Effect of stale seedbed on cucurbit harvest when used with several herbicides applied immediately prior to cucurbit emergence (2012).

Treatment	Rate	Number of fruit ^a			Total fruit yield ^a		
		Cucumber	Pumpkin	Squash	Cucumber	Pumpkin	Squash
	product/a	number/a	number/a	number/a	lb/a	lb/a	lb/a
Stale seedbed							
7 days	---	149,589	12,062	7,772	8,273	5,000	11,148
3 days	---	146,685	11,913	7,953	8,631	5,304	11,922
0 days	---	146,520	11,600	7,706	8,230	5,130	11,242
Nonselective herbicide							
Roundup	2 pt	146,168	11,308	7,766	8,427	4,992	11,316
Gramoxone	2.4 pt	148,368	11,924	7,876	8,463	5,169	11,592
Flame	---	150,876	11,836	7,590	8,401	5,134	11,474
None	---	144,980	12,364	8,008	8,221	5,281	11,367
Residual herbicide							
Command + Curbit	5 fl.oz + 2 pt	152,460	12,573	7,722 b	8,445	5,670	11,960
Command + Dual Magnum	5 fl.oz + 5 fl.oz	147,972	11,913	7,359 b	8,799	5,243	11,538
Command + Sandea	5 fl.oz + 0.5 oz	148,698	11,583	8,448 a	8,700	4,840	11,926
Dual Magnum + Curbit	5 fl.oz + 2 pt	142,098	12,111	7,854 ab	7,926	5,144	11,158
Dual Magnum + Sandea	5 fl.oz + 0.5 oz	147,774	12,111	8,019 ab	8,092	5,160	11,393
None	---	146,586	10,857	7,458 b	8,305	4,806	10,649

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