

Project Number: 13K 3419 6228

Title: Weed control in cucurbits

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Reporting Period: 2010-11

Accomplishments: One study was conducted in 2011, 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:

Stale seedbed trial. Pickling cucumber, mini-pumpkin, and acorn squash was seeded at WSU Mount Vernon NWREC July 1, 2011 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 4 and two nonselective herbicides, Roundup (glyphosate) and Gramoxone (paraquat), or flame (propane flamer) were applied preemergence (PRE) July 6, immediately prior to cucumber shoot emergence, but postemergence (POST) to many weed seedlings. Crop injury and weed control was estimated August 10. 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 7-8. Squash and pumpkins were harvested in the same manner on October 13 and from October 18-20, respectively. The experimental design was a split-split-block, randomized complete block with three replicates.

Weed control was generally better in the 7-day stale seedbed, followed by the 3-day seedbed (85 and 82%, respectively) (Table). When averaged over the nonselective herbicide applications, weed control was maximized by Roundup or Gramoxone (89 and 87%, respectively). Flame did not significantly affect weed control as compared to the non-flamed cucurbits. Residual herbicides were moderately effective, resulting in from 84 to 89% control. There was no visible crop injury from any of the treatments.

Average fruit weight was the same among each cucurbit type (Table); that is, cucumbers, pumpkin, and squash did not significantly differ in weight among the treatments. Although not statistically significant, cucumbers tended to be larger when planted in a 0- or 3-day seedbed, and generally responded favorably to herbicide treatments. Pumpkins tended to be larger in stale seedbed treatments, while response to herbicide application wasn't clear. Acorn squash was significantly larger when treated with Dual Magnum + Curbit than when treated with Command + Curbit, and there was a trend toward larger fruit when nonselective products were used, but response to stale seed bed wasn't clear.

Table. Effect of stale seedbed on weed control from several herbicides applied immediately prior to cucumber emergence (2011).

| Treatment | Rate | Weed control | Average cucumber weight ^a | Average pumpkin weight ^a | Average squash weight ^a |
|-------------------------------|-------------------|--------------|---|--|---------------------------------------|
| <u>Stale seedbed</u> | | | | | |
| | product/a | % | g/fruit | g/fruit | g/fruit |
| 7 days | --- | 85 a | 46.5 | 260.4 | 824.7 |
| 3 days | --- | 82 ab | 47.9 | 228.6 | 862.6 |
| 0 days | --- | 80 b | 47.9 | 223.6 | 831.6 |
| <u>Nonselective herbicide</u> | | | | | |
| Roundup | 2 pt | 89 a | 50.1 | 233.1 | 846.5 |
| Gramoxone | 2.4 pt | 87 a | 46.5 | 224.1 | 853.7 |
| Flame | --- | 78 b | 46.9 | 224.8 | 830.2 |
| None | --- | 76 b | 46.2 | 264.8 | 828.8 |
| <u>Residual herbicide</u> | | | | | |
| Command + Curbit | 5 fl.oz + 2 pt | 85 ab | 46.2 | 221.6 | 791.5 c |
| Command + Dual Magnum | 5 fl.oz + 5 fl.oz | 88ab | 45.6 | 290.5 | 858.6 ab |
| Command + Sandea | 5 fl.oz + 0.5 oz | 89 a | 46.8 | 225.5 | 843.4 ab |
| Dual Magnum + Curbit | 5 fl.oz + 2 pt | 84 b | 50.4 | 219.9 | 877.6 a |
| Dual Magnum + Sandea | 5 fl.oz + 0.5 oz | 88 ab | 47.9 | 228.5 | 850.9 ab |
| None | --- | 62 c | 47 | 230.0 | 815.2 bc |

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 9, 2011; PRE herbicides applied July 6, 2011 (PRE to crop, POST to weeds); residual herbicides applied July 4, 2011.

^aCucumbers were harvested September 7-8, 2011; squash were harvested October 13; pumpkins were harvested October 18-20.