

Project Title: Weed Management Studies for Processing Vegetables

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Objective:

The objective of this research project was to develop improved weed management programs for processing peppers, cole crops, squash, pumpkins and sweet corn by evaluating a range of herbicides for crop tolerance and weed control efficacy on these crops. Information on yield, crop sensitivity and control of problem weeds was developed. Improved weed management programs reduce the need for labor for hand hoeing and weeding, reduce the cost of production to the grower and enhance competitiveness of the processing vegetable industry.

Methodology:

Research trials were carried out at the Dept. of Plant Agriculture, University of Guelph, Simcoe during the summer of 2004. Treatments were replicated four times in each experiment. Plots were 10 m long by either 2 m or 1.5 m wide. Plants were thinned to a known stand appropriate for each crop. Crops were grown according to accepted commercial practices used in Ontario. Crop injury, weed counts, weed biomass, weed ratings and yield were recorded. All trials were harvested by hand at crop maturity. Data was statistically analyzed, tabulated and reported.

Results:

Peppers

Peppers were very tolerant to high-rate applications of Command ME (clomazone) (0.94 L/A). There was no crop injury or yield reduction at this application rate. Peppers were also tolerant to preemergence applications of Dual Magnum (s-metolachlor) and a combination of Dual Magnum plus Devrinol (napropamide). There was no crop injury to peppers from these treatments and the combination of these two products increased yield. A combination of Command ME plus Dual Magnum or Command ME plus Devrinol gave excellent broad spectrum weed control with no crop injury and yields were comparable to the weeded check. Dual Magnum is now close to a minor use registration for peppers. Frontier (dimethenamid) gave results comparable to Dual Magnum. Spartan (sulfentrazone), preplant and Dacthal (chlorthal-dimethyl), preemergence, caused severe injury and reduced yields. Sandea (halosulfuron) caused no injury but gave poorer weed control.

Pumpkins and Squash

Pumpkins and squash were tolerant to applications of Command ME (clomazone). There was no injury and there was good broadleaf weed control. Pumpkins and squash were also tolerant to preemergence applications of Dual Magnum (s-metolachlor) and Devrinol (napropamide). There

was no injury to pumpkins and squash from these treatments. A combination of Command ME plus Dual Magnum gave the best broad spectrum weed control with no crop injury and yields comparable to the weeded control. Command ME has been submitted for a minor use registration for pumpkin, squash, cucumber, and pepper. Sandea (halosulfuron), as a preemergence application, resulted in slight crop injury but increased yield. Spartan (sulfentrazone) resulted in significant crop injury, gave excellent broadleaf weed control but reduced yield. Dacthal (chlorthal-dimethyl) caused injury in pumpkins and squash but reduced yields in squash only. There was a very high population of pigweed and lambs-quarters in the squash trial and, therefore, yields for all treatments were reduced, compared to the weeded control.

Crucifer Crops

Frontier (dimethenamid) applied alone in cabbage and cauliflower resulted in very slight crop injury and excellent grass control but had reduced broad-leaf weed control, compared to the combination of Dual Magnum plus Devrinol and Frontier plus Dacthal (chlorthal-dimethyl). These treatments did not result in any crop injury and gave excellent broadleaf and grass weed control with no significant yield reduction. The combination of Devrinol followed by Muster (ethametsulfuron-methyl) plus Lontrel (clopyralid) resulted in good broadleaf weed control with no injury, however, yields were reduced compared to the weeded check. Goal (oxyfluorfen) gave good broadleaf weed control but reduced grass control. This, however, did not affect the final yield. Spartan (sulfentrazone) did not cause injury, gave good broadleaf weed control, but reduced grass control and significant yield reductions.

Sweet Corn

All sweet corn varieties were tolerant to the preemergence application of Callisto (mesotrione). All sweet corn varieties except for DelMonte 2038 were tolerant to the postemergence application of Callisto (mesotrione). Significant injury on DelMonte 2038 was observed at both 100 and 200 g/ha. Yields of the six sweet corn hybrids were not reduced by any of the herbicide treatments (pre or postemergence) and there was no cultivar x herbicide interactions for any of the herbicide treatments evaluated. In trials performed under plastic, regardless of herbicide combinations used, the highest yields of corn were produced under the clear plastic. There was no herbicide treatment that resulted in crop injury. Callisto alone, under clear plastic, compared to bare soil gave higher yields of marketable corn. Callisto plus Primextra II Magnum (s-metolachlor/benoxacor/atrazine) and Lumax (mesotrione/s-metolachlor/atrazine) gave higher yields than Callisto alone.