

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 cucumbers, 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 2003. Treatments were replicated four times in each experiment. Plots were 10 m long by either 2 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:

Cucumbers

No herbicide treatment caused crop injury. Command ME caused no injury and had good control on all weeds except pigweed. Low rates of Command ME (clomazone) gave poor pigweed control. Increased rates improved pigweed control. The addition of Sandea (halosulfuron) postemergence improves pigweed control and gave yields comparable to the weeded check. Alanap (naptalam) especially postemergence also controlled pigweed but yields were somewhat reduced compared to Sandea. Two applications of Basagran (bentazon) postemergence at 1/2X recommended rate gave good broadleaf weed control. Assure (quizalofop-p-ethyl) gave excellent grass control postemergence.

Peppers

Peppers were extremely tolerant to high-rate applications of Command ME (clomazone). There was no crop injury or yield reduction at the 2X application rate. Peppers were also tolerant to pre-emergence applications of Dual Magnum (s-metolachlor) and Devrinol (napropamide) or a combination of Dual Magnum plus Devrinol. In addition, there was no crop injury to peppers from this treatment and yields were increased, compared to each product used alone. A combination of Command plus Dual Magnum or Command 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) caused severe injury and reduced yields. Sandea (halosulfuron) also caused injury and reduced yields. Valor (flumioxazin) 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 crop injury and there was good weed control. Pumpkins and squash were also tolerant to pre-emergence applications of Dual Magnum (s-metolachlor) and Devrinol (napropamide). There was no injury to pumpkins and squash from these treatments. A combination of Command plus Dual Magnum gave excellent broad spectrum weed control with no crop injury or yield reductions. Command ME is now being submitted for a minor-use registration for pumpkin, squash, cucumbers, and peppers. Sandea (halosulfuron), as a pre-emergence application, resulted in significant crop injury. Spartan (sulfentrazone) also resulted in significant crop injury but gave excellent weed control with no yield reduction. Dacthal (DCPA) caused crop injury in squash only.

Crucifer Crops

Dual Magnum (s-metolachlor), Frontier (dimethenamid) or Dacthal (DCPA) applied alone in crucifer crops resulted in no crop injury and excellent grass control but had reduced broad-leaf weed control, compared to the combination of Dual Magnum plus Devrinol and Dual Magnum plus Dacthal. These treatments did not result in any crop injury and gave excellent broadleaf and grass weed control with no significant yield reduction. Muster (ethametsulfuron-methyl) plus Lontrel (clopyralid) resulted in improved broadleaf weed control. The combination of Devrinol followed by Muster plus Lontrel gave improved weed control compared to each of these products applied alone, with no injury and yields were comparable to the weeded check. Goal (oxyfluorfen) gave very good weed control but did result in a small amount of leaf injury, however, this did not affect the final yield. Spartan (sulfentrazone) did not cause injury, gave good broadleaf weed control, but reduced grass control.

Sweet Corn

There was no injury on any sweet corn varieties following preemergence application of Callisto (mesotrione). Callisto under clear plastic gave excellent broadleaf weed control and the highest yields of marketable corn. Lontrel (clopyralid) applied alone gave unsatisfactory broadleaf weed control and reduced yields. Option (foramsulfuron) gave good broadleaf weed control but reduced grass control and yields. Callisto plus Primextra gave superior weed control to Primextra alone. No herbicide treatment resulted in crop injury.