

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 2002. Treatments were replicated four times in each experiment. Plots were 10 m long by 2 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

Cucumbers (cv. Vlaspick M) were seeded on June 6, 2002 in rows 30" apart to give a plant population of approximately 72,000 plants per acre. A John Deere vacuum seeder was used for precision seeding. Preemergence treatments were applied on June 6. Early postemergence applications were applied on June 19 and postemergence applications were made on June 29. The crop was harvested on July 29. Sandea (halosulfuron) caused no injury pre-emergence, however, postemergence applications caused some injury to the cucumber crop. Command ME caused no injury and had good control on all weeds except Pigweed. Basagran at low rates (1/4 x of full rate) gave the best overall weed control no injury or yield reductions.

Peppers

Peppers were shown to be extremely tolerant to high-rate applications of clomazone (Command ME). There was no crop injury or yield reduction at the 2x application rate and yields were comparable to the weeded check. Peppers were also tolerant to pre-emergence applications of s-metolachlor (Dual Magnum) and napropamide (Devrinol) or a combination of s-metolachlor (Dual Magnum) plus napropamide (Devrinol). Also, 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 napropamide (Devrinol) gave

excellent broad spectrum weed control with no crop injury or yield reductions. Dual magnum is now close to a minor-use registration for peppers.

Pumpkins and Squash

Pumpkins and squash were tolerant to applications of clomazone (Command ME). There was no crop injury at the lower application rate (0.63 L/A) and there was good weed control. Pumpkins and squash were also tolerant to pre-emergence applications of s-metolachlor (Dual Magnum) and napropamide (Devrinol). There was no injury to pumpkins and squash from these treatments. A combination of Command plus napropamide (Devrinol) 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. Sandca, both as a pre-emergence and especially as a post-emergence application, resulted in significant crop injury and reduced yields.

Crucifer Crops

S-metolachlor (Dual Magnum) 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 s-metolachlor (Dual Magnum) plus napropamide (Devrinol). S-metolachlor (Dual Magnum) plus napropamide (Devrinol) did not result in any crop injury and gave excellent broad-leaf and grass weed control with no significant yield reduction.

Pyridate(Lentagran) plus clopyralid(Lontrel) on crucifer crops resulted in improved broad-leaf weed control and yields that were comparable to the weeded check. This treatment did result in a small amount of leaf injury, however, this did not affect the final yield. This treatment is equally effective on Asian crucifer crops.

Sweet Corn

Nicosulfuron (Accent) was evaluated on eight processing sweet corn varieties at the 1X application rate (13.5 g/A) and the 2X application rate (27 g/A) In processing sweet corn, seven of the eight varieties had injury of less than 5% at the 2X application rate. This is considered to be acceptable crop safety. There were no plant height or yield reductions. One variety (Empire) had injury of 11% at the 2X application rate. However, there were no plant height or yield reductions with this variety. A combination of Accent plus Pardner caused significant injury to several sweet corn varieties, however, there were no plant height or yield reductions with any variety.