

Project Title: Weed Management Studies for Processing Vegetables

Researcher: Dr. John O'Sullivan, Dept. Of Plant Agriculture, University of Guelph, Simcoe

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 2005. 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:

Bell Peppers

Bell peppers were very tolerant to high-rate applications of Command (clomazone) (0.94 L/A). There was no crop injury at this application rate. Peppers were also tolerant to preemergence applications of Dual Magnum (s-metolachlor) and Frontier (dimethenamid). A combination of Command plus Dual Magnum or Command plus Frontier gave improved broad spectrum weed control with no crop injury. Dual Magnum is now registered for bell peppers. Frontier gave results comparable to Dual Magnum. Spartan (sulfentrazone) and Valor (flumioxazin) (preplant) at low rates caused no injury and gave excellent broad-leaf weed control but poor grass control. The addition of a grass herbicide would have increased yields. Callisto (mesotrione) caused severe crop injury. Sencor (metribuzin) at very low rates also caused injury. Sandea (halosulfuron-methyl) post caused slight injury and gave poor weed control. Pinnacle (post) and especially Spartan and Valor (preplant) at low rates, combined with a grass herbicide require further testing and look most promising for improved pepper weed control. Heavy late-season weed pressure gave reduced yields compared to the weeded check.

Banana Peppers

Banana peppers were more sensitive to certain herbicides, i.e. Callisto (mesotrione), Sencor (metribuzin), Spartan (sulfentrazone), Valor (flumioxazin) and Sandea (halosulfuron-methyl) than were bell peppers. The response to other herbicides was similar to bell peppers. Command, Dual Magnum, Frontier, Devrinol and Pinnacle gave improved weed control with no crop injury. Pinnacle in particular looks promising for

improved broad-leaf weed control, with no injury to banana peppers. Heavy weed pressure late in the season reduced yields compared to the weeded check

Squash

Squash were tolerant to applications of Command (clomazone). There was no injury and there was good broadleaf weed control. Squash were also tolerant to preemergence applications of Sandea (halosulfuron-methyl), Dual Magnum (s-metolachlor) and Devrinol (napropamide). There was no injury to squash from these treatments. A combination of Command plus Sandea gave the best broad spectrum weed control with no crop injury and higher yields. Command has been submitted for a minor use registration for pumpkin, squash, cucumber, and pepper. There was a very high population of pigweed and lambs-quarters in this trial and therefore, yields for all treatments were reduced, compared to the weeded control.

Pumpkins

Pumpkins were tolerant to applications of Command (clomazone). There was no injury and there was good broadleaf weed control. Pumpkins were also tolerant to preemergence applications of Sandea (halosulfuron-methyl), Dual Magnum (s-metolachlor) and Devrinol (napropamide). There was no injury to pumpkins from these treatments. A combination of Command plus Sandea gave the best broad spectrum weed control with no crop injury and yields comparable to the weeded control. Command has been submitted for a minor use registration for pumpkin, squash, cucumber, and pepper.

Cabbage

Only Spartan (sulfentrazone) and Dacthal (chlorthal-dimethyl) caused very slight injury (<5%) to cabbage. Combinations of Dacthal plus Dual Magnum or Frontier gave 100 % grass control. Several herbicide combinations and Spartan gave excellent broad-leaf weed control and yields comparable to the weeded check

Cauliflower

Only Spartan (sulfentrazone) and Dacthal (chlorthal-dimethyl) caused very slight injury (<5%) to cauliflower. Dual Magnum and Frontier gave excellent grass control. Herbicide combinations gave improved broad-leaf weed control. Several herbicide combinations gave yields comparable to the weeded check.