

## Colorado potato beetle damage in processing tomatoes grown under reduced tillage and conventional tillage

Dave Hunt, Agriculture and Agri-Food Canada, Research Centre, Harrow, Ontario N0R 1G0

Field experiments were conducted at the Harrow Research Center in a sandy loam field where tomatoes have been grown for several years. Raised beds were formed and seeded with a rye cover crop in late September/1996. The rye cover crop was killed with 0.5 or 1.0 L/ac of glyphosate herbicide at a height of either 15 or 30 cm to create treatments with different amounts of rye residue. The initial application of glyphosate to the fall rye was on April 24/1997. For treatments where the rye in the 75 cm band between planting areas was to grow to 30 cm to increase residue levels, a second application of glyphosate was applied on May 6/1997. Any other herbicides that were included in the treatments were broadcast on the dead rye and incorporated with 5 cm wavy coulters set at a depth of 10 cm. This facilitated soil fracturing and loosening to allow for transplant establishment with minimal disturbance of the rye residue. 'Ohio 9478' tomato transplants supplied by the H. J. Heinz Co. were transplanted into twin-rowed 1.5 m beds at a plant spacing of 30 cm.

The treatments are summarized on the following page. Superimposed on these treatments, 5 of the treatments received weekly insecticide sprays of either Guthion or Ambush as required, and 5 received no insecticide. Each of these 10 treatments were then replicated 4 times in a randomized complete block design. Each plot consisted of 5 raised beds that were 8 m long and 1.5 m in width. Treatments were cultivated using standard commercial practices at 2 and 4 weeks unless otherwise specified.

Colorado potato beetle abundance was recorded at approximately weekly intervals throughout the season. Subplots of 60 plants within each plot were used to count egg masses, small larvae (1st and 2nd instars), large larvae (3rd and 4th instars), and adults. Estimates of defoliation caused by the Colorado potato beetle were also recorded while counts were being made. Percent residue cover was estimated in each plot by stretching a knotted rope across the beds and recording the proportion of the knots that had rye residue beneath them. Plots were mechanically harvested on August 20, with weights taken for each treatment for marketable, green and cull fruit.

Early in the season the "rye" plots were infested with significantly fewer Colorado potato beetles than the "no rye" tomatoes. Defoliation levels through the season were significantly lower in the plots containing rye residue, although a weekly insecticide treatment was slightly more effective in reducing defoliation.