

EFFECTS OF RIMSULFURON ON TRANSPLANT TOMATOES

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Abstract

Rimsulfuron (DPX-E9636) has been tested in California as a tomato herbicide since 1991. Rimsulfuron has proven to be effective in weed control programs when applied preemergence or postemergence by itself, or when used in combination with other herbicides. The application rates range from 0.25 to 0.50 ounces active ingredient per acre pre or post with a maximum total application rate of 1 ounce active ingredient per acre per year.

Postemergence tests, such as this one, have shown that rimsulfuron must be applied with surfactant when weeds are less than 1 inch in height or 1 inch in diameter for consistent postemergence weed control.

Studies have shown the mode of action of rimsulfuron to be a potent inhibitor of acetolactate synthase enzyme in both tomato and weeds. The basis of selectivity has been found to be the rapid metabolism in the tomato. It is because of this rapid metabolism that residue tests conducted in California have shown that there are no detectable residues in the harvested tomato fruit when the rimsulfuron is applied 45 days or more before harvest.

Crop response tests, such as this one, show the high tolerance and safety of postemergence applications of rimsulfuron under normal environmental conditions. When under environmental stress, tomatoes can exhibit a temporary chlorosis and stunting after rimsulfuron application. However, the crop response tests have not shown any long term stunting or chlorosis, as well as no negative effect on tomato yield or quality which was also the case in this particular transplant test with Bos 3155.

Introduction

Rimsulfuron (DPX-E9636) is a new herbicide for tomato weed control and has been tested in California as such since 1991. Rimsulfuron has proven to be an effective herbicide when applied preemergence, postemergence by itself, or when used in combination with other herbicides in a weed control program. The rates of application range from 0.25 to 0.50 ounces active ingredient per acre pre or postemergence, with a maximum total application rate of 1 ounce active ingredient per acre per year.

Mode of action studies have shown that rimsulfuron is a potent inhibitor of acetolactate synthase enzyme in both tomato and weeds, and that the basis of selectivity is rapid metabolism in the tomato. This rapid metabolism in the tomato has been the reason for conducting residue tests in California and around the world. These tests have shown that there are no detectable residues in the harvested tomato fruit when rimsulfuron is applied 45 days or more before harvest. Both direct seeded and transplant tomatoes have also been shown to be highly tolerant of postemergence applications of rimsulfuron in crop response tests.

The objective of this test was to evaluate the effects of rimsulfuron applied to Bos 3155 transplanted tomatoes at 3 different intervals after transplanting. This trial will determine if the transplants exhibit phytotoxicity to rimsulfuron as well as its effectiveness in controlling the target weeds of Rough Redroot Pigweed (*Amaranthus retroflexus* L.) and Common Purselane (*Portulaca oleracea*).

Materials and Methods

The surface width of each treatment was 3.30 feet and the length was 90 feet. The tomatoes were transplanted onto 60" beds with a single row mechanical transplanter pulled behind a small tractor. The planting wheel was configured such that the tomatoes were planted on a spacing of approximately 17" between plants. At time of planting, the transplants were healthy.

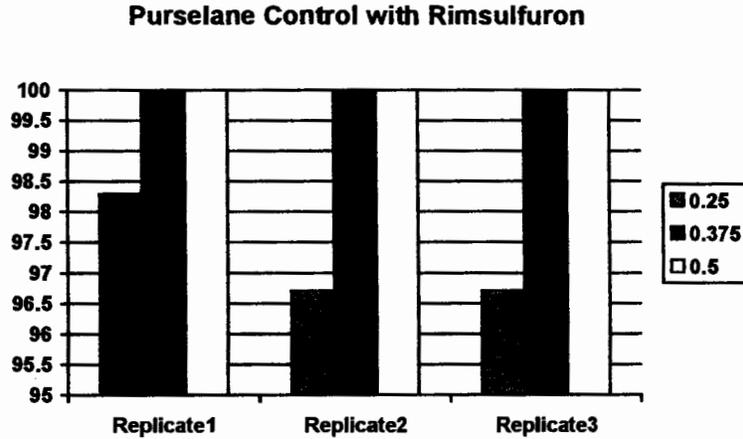
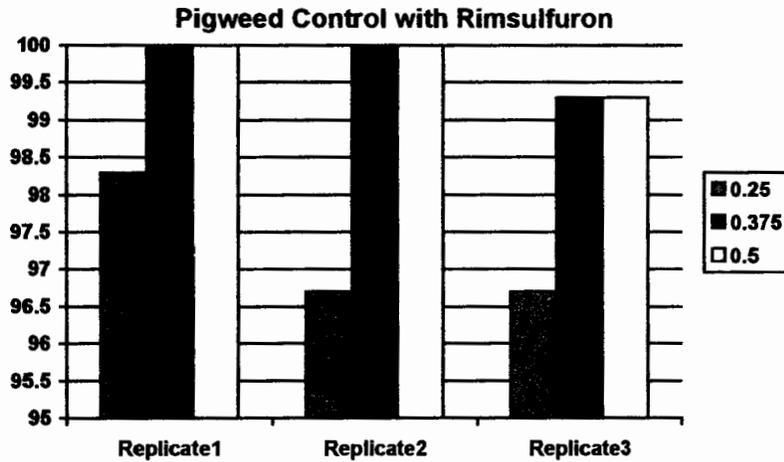
Three rates of rimsulfuron were applied on each of 3 application timings. The application timings were: 1) immediately after transplanting, 2) 7 days and 3) 14 days after transplanting.

All three applications of rimsulfuron were made with a CO₂ backpack sprayer. The material was broadcast at a height of 20" over the transplants using two 8003 Tee Jet nozzles with a 20" spacing. The rimsulfuron was applied at rates of 0.25, 0.375 and 0.50 ounces active ingredient per acre at a volume of 25 GPA and 30 PSI for all three applications. The solution was diluted in water in conjunction with a non-ionic surfactant at 1/2% by volume mixture.

Approximately 1 inch of water was applied through solid set sprinkler lines within 4 hours of the rimsulfuron application. Sprinklers were set to provide full, complete and uniform application of water. Irrigation amounts were monitored with an in field rain gauge.

Results

The evaluations from this trial indicate that rimsulfuron at the rates evaluated has excellent safety and weed control to this variety of tomatoes. There was no difference in crop safety from applications made the day of transplant and those made 7 and 14 days after transplanting. Potential crop yield was observed and there were no differences in the fruit due to any treatment effect. The untreated checks were full of weeds resulting in small, weak looking plants due to the competition for sun, nutrients and space.



Discussion and Conclusions

This test along with others has proven the effectiveness of rimsulfuron as a new herbicide for tomato weed control in California. Rimsulfuron is a versatile herbicide which makes it a valuable one. With rimsulfuron there are the options of applying preemergence, postemergence or in combination with other herbicides in a weed management program on tomatoes with application rates of 0.25, 0.375 or 0.50 ounces active ingredient per acre pre or postemergence. These options allow the grower to choose to apply herbicide prior to planting or immediately following transplanting while the target weeds are in small cotyledon stage of growth. Any regrowth of weeds later in the season can easily be managed by timely hand hoeing or light cultivation.

In conclusion, rimsulfuron exhibited effective weed control at the various rates used on this variety of transplant tomatoes and there were no visible signs of phytotoxicity such as chlorosis or stunting of the plants.