

SEASON-LONG WEED CONTROL IN TREE FRUIT WITH PREEMERGENCE AND POSTEMERGENCE HERBICIDES. Rodney V. Tocco*, Bernard H. Zandstra, and Chad M. Herrmann, Research Assistant, Professor, and Graduate Research Assistant, Department of Horticulture, Michigan State University, East Lansing MI 48824-1325.

Tree fruit growers have used PSII inhibitors for residual weed control for many years. Simazine, diuron, and terbacil still are used widely because of their effectiveness and low cost. However, lack of rotation of mode of action has led to weed resistance and species shifts. Most orchards are treated at some time during the year with glyphosate to kill emerged weeds. The very narrow range of herbicides used is a result of lack of good alternatives, low cost, and grower habit. Several new herbicides have been registered or are being developed for pre or post-emergence weed control in perennial crops. Experiments were conducted in 2008 and 2009 to compare weed control efficacy and potential crop injury on dwarf apples at Clarksville and East Lansing, MI. Preemergence treatments were applied in fall or early spring (Early Pre-EPRE) or late spring (Late Pre-LPRE). Postemergence treatments were applied in early June (Early Post-EPOS) or early July (Late Post-LPOS).

Flumioxazin applied in fall at 0.383 lb/a plus glyphosate 0.43 lb/a provided essentially 100% control of all weeds until June 1, after which horseweed, white clover, wild carrot, birdsfoot trefoil, and perennial ryegrass emerged. The same treatments applied in early-May (LPRE) maintained slightly better control of horseweed, white clover and perennial ryegrass through August 1, after which all three weeds proliferated. Good control of other grasses and broadleaves was maintained until September. Saflufenacil applied at 0.045 lb/a in mid-April (EPRE) did not control grasses. It gave good control of most broadleaves including horseweed until August 1. It was weak on curly dock, dandelion, shepherd's purse and other mustards. The same treatments applied in early-May (LPRE) maintained better control until June 1, after which alfalfa, birdsfoot trefoil, and wild carrot proliferated. Rimsulfuron applied at 0.064 lb/a EPRE suppressed most broadleaves until early June, when prostrate knotweed, alfalfa, curly dock, birdsfoot trefoil and redstem filare began to emerge. The same treatments applied in early-May (LPRE) and separately in early-June (EPOS) maintained slightly better control through September 1. Sulfentrazone applied at 0.375 lb/a EPRE did not control grasses, red clover, and birdsfoot trefoil. It was weak on alfalfa, dandelion, horseweed, rough fleabane and shepherd's purse. It controlled common chickweed, prostrate knotweed, and common lambsquarters. Mesotrione applied at 0.188 lb/a EPRE did not control grasses, but suppressed all broadleaves through June 1. Terbacil applied at 2.4 lb/a EPRE controlled all weeds through July 1. Application of glyphosate at 0.43 lb/a or glufosinate at 1.04 lb/a in early June (EPOS) following various EPRE treatments extended control of all weeds except perennial ryegrass into September.

None of the treatments caused visual injury to apple. If residual herbicides are rotated and applied with foliar-active herbicides to kill emerged vegetation, it is possible to maintain season-long weed control and avoid species shift or weed resistance.