

METHYL BROMIDE ALTERNATIVES FOR NURSERY PRODUCTION. Michael W. Marshall, Daniel A. Little, Robert J. Richardson, and B.H. Zandstra, Research Associate, Graduate Research Assistant, Former Research Associate, and Professor, Michigan State University, East Lansing, MI 48824.

Nursery and Christmas tree production is an important part of Michigan's economy. Michigan generates an estimated \$351 million in annual sales and growers markets products in 35 states, Canada and Mexico. Methyl bromide has been an important pest management tool for growers in nursery and conifer seedling production. With the phase-out of methyl bromide, growers are seeking alternative weed control tools. Field studies were established in 2004 through 2007 to evaluate safety and effectiveness of various herbicide combinations on five herbaceous perennial species, six seedling conifer species, and various weed species. Herbaceous perennials tested included bugleweed (*Ajuga reptans*), daylily (*Hemerocallis* spp.), Lupine (*Lupinus* spp.), Periwinkle (*Vinca minor*), and Hosta (*Hosta* spp.). Conifer species evaluated were Colorado blue spruce (*Picea pungens*), Fraser fir (*Abies fraseri*), Balsam fir (*Abies balsamea*), white pine (*Pinus strobes*), and Douglas fir (*Pseudotsuga menziesii*). Methyl bromide and Telone C-35 treatments were applied when soil temperatures were above 21°C and were tarped for 10 days. All perennials and conifer seedlings were transplanted 12 days after the fumigation treatments and the herbicide treatments were applied over the top two days after transplanting. Experimental design consisted of a randomized complete block design with 3 replications. In all years, methyl bromide (98:2, 392 kg/ha) provided the least amount of crop injury and better than 70% control of the weed species evaluated, except vetch (*Vicia* spp.) which was not controlled. The herbicide combination of oryzalin (3.36 kg/ha) plus isoxaben (1.12 kg/ha) also provided greater than 70% control of all evaluated weed species, except large crabgrass (*Digitaria sanguinalis*), while causing less than 10% crop injury. Flumioxazin provided weed control of greater than 75%, but caused unacceptable crop injury to all crops except periwinkle. In the seedling conifer study, treatments containing oxyfluorfen (1.12 kg/ha) had weed control similar to methyl bromide, with minimal crop injury. Adding metolachlor (1.68 kg/ha) to oxyfluorfen provided greater than 75% weed control of all weed species rated in all years. Though not currently labeled for conifers, mesotrione (0.28 kg/ha) provided greater than 75% weed control of all weed species rated in 2004 and 2005 and crop injury was minimal in the fir spp. Overall, flumioxazin, oxyfluorfen, oxyfluorfen + metolachlor, and oxyfluorfen + dithiopyr provided the best overall weed control with acceptable safety on all crops.