

EVALUATION OF HERBICIDES FOR WEED CONTROL IN HORSERADISH. Elizabeth A. Wahle, Extension Educator, University of Illinois Extension, Edwardsville, IL 62025 and John B. Masiunas, Associate Professor, Department of Natural Resources and Environmental Sciences, University of Illinois, Urbana, IL 61801.

Weed management in horseradish is a major problem even though different control strategies such as cultivation, hand-weeding and herbicides are widely used. The currently registered herbicides (glyphosate, DCPA, oxyfluorfen, sethoxydim, and clethodim) do not control many of the common weeds occurring in horseradish production. DCPA, although widely used by growers for PRE grass control is inconsistent and costly. There are no POST broadleaf herbicides registered for horseradish. Sulfentrazone at 0.28 kg/ha PRE has recently been used on horseradish under Section 18 exemptions. Carfentrazone is another triazolone herbicide being developed as a POST herbicide on a range of crops. If carfentrazone has adequate horseradish safety it might reduce the need for hand-weeding. Dimethenamid, currently being registered for crucifer crops including horseradish, dimethenamid will reduce reliance on DCPA and provide more consistent grass control. Our objective was to evaluate these herbicides for their crop safety and efficacy. The experimental design was a randomized complete block design with four replications. The field had a light and relatively uniform infestation of redroot pigweed (*Amaranthus retroflexus*), common lambsquarters (*Chenopodium album*), witchgrass (*Panicum dichotomiflorum*), and fall panicum (*Panicum capillare*). The '7586' cultivar of horseradish was planted on April 16. Each plot was 6 m long and contained three rows of horseradish. Herbicide treatments were applied using a CO₂ pressurized backpack sprayer fitted with 1.7 m wide hand-held boom that had four 8003 flat fan nozzle tips. The sprayer was calibrated to deliver 253 L/ha at 207 kPa. PRE herbicide treatments were applied on April 25 before crop and weed emergence. The POST treatments were applied on June 3 when the horseradish was 30 cm tall and the weeds were 15 to 30 cm tall and sparse. Crop injury was rated on June 3, June 26, and August 23 using a scale of 0 = no injury and 10 = complete plant death. Horseradish stand was counted on June 3. Weed control was rated on a scale of 0 = no control to 100 complete weed control. Weed control was based on the portion of the plot without weeds. Data were analyzed using the GLM procedure of SAS and means separated using Fisher's least significant difference (LSD) at 5%. Neither the PRE treatments nor the POST carfentrazone treatment injured the horseradish plants or reduced the stand compared to the untreated control. Weed populations were light and substantial emergence in even the control treatment did not occur until mid June, approximately 6 weeks after initiation of the research. Grass weeds were particularly uncommon in our research site and grass control was greater than 90% even in the untreated check plots. Broadleaf weed control was more varied but was still above 85% in the untreated check. Oxyfluorfen + sulfentrazone provided 95% or above control in both the early and late weed control ratings. The broadleaf weed control lasted longer and was better on August 23 in the combination treatment than oxyfluorfen alone but not sulfentrazone alone. Carfentrazone did not improve weed control compared to either the oxyfluorfen or sulfentrazone alone. This lack of improved weed control is likely because the low weed densities in our experiment would not normally justify a POST herbicide application. Dimethenamid alone and oxyfluorfen alone did not provide adequate broadleaf weed control through August 24 and should be combined with other herbicides for season-long weed control. Sulfentrazone alone or in combination with other herbicides has excellent safety for horseradish. Sulfentrazone also controls broadleaf weeds for a longer period than the older standard herbicide, oxyfluorfen. This longer length of control is critical because much of horseradish root size develops in August and September. Dimethenamid also has good safety on horseradish but will need to be combined with another herbicide for season-long weed control. Dimethenamid will likely improve grass control compared to either sulfentrazone or oxyfluorfen alone. Carfentrazone did not injury horseradish and would be welcome as a POST treatment to control broadleaf weeds.

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