

EVALUATION OF HERBICIDES FOR USE IN PUMPKINS. John Masiunas and Abram Bicksler, Associate Professor and Graduate Research Assistant, Department of Natural Resources and Environmental Science, University of Illinois, 1201 West Gregory Dr., Urbana, IL 61801.

Weed management in jack o'lantern and processing pumpkins relies on preemergence (PRE), surface applications of ethalfluralin and clomazone (Clomazone + ethalfluralin) after pumpkin planting and before crop emergence. Clomazone and ethalfluralin do not control eastern black nightshade or Amaranth species. Pumpkins can be injured if clomazone or ethalfluralin is washed into the crop zone. If broadleaf weeds or yellow nutsedge are problem then halosulfuron can be applied either PRE or postemergence (POST) after the crop is established. Halosulfuron is an acetolactase synthetase inhibitor (ALS-inhibitor) herbicide and problems have occurred with nightshade and water hemp biotype resistance to ALS-inhibitors. New options are needed to address resistance problems and provide pumpkin with diverse and economical tools for managing weeds in pumpkins. The objective of our study was to determine the efficacy and crop safety of standard and potential herbicide treatment for pumpkin. The treatments were: 1) weedy control; 2) clomazone + ethalfluralin at 1.3 + 0.42 kg/ha (PRE); 3) clomazone + ethalfluralin + halosulfuron at 1.3 + 0.42 + 0.069 kg/ha (PRE); 4) clomazone + ethalfluralin + halosulfuron at 0.88 + 0.27 + 0.069 kg/ha (PRE); 5) clomazone + ethalfluralin + halosulfuron/ clethodim at 1.3 + 0.42 + 0.069/ 0.107 kg/ha (PRE/POST); 6) halosulfuron/ halosulfuron + clethodim at 0.046/ 0.046 + 0.107 kg/ha (PRE/POST); 7) clomazone + ethalfluralin/ carfentazone at 1.3 + 0.42/ 0.105 (PRE/DPOST); 8) clomazone + ethalfluralin + flumioxazin at 1.3 + 0.42 + 0.105 (PRE); 9) clomazone + ethalfluralin/ flumioxazin at 1.3 + 0.42/ 0.105 kg/ha (PRE/ DPRE); 10) clomazone + ethalfluralin + halosulfuron/ flumioxazin at 1.3 + 0.42 + 0.069/ 0.105 kg/ha (PRE/ DPRE); 11) s-metolachlor at 1.4 kg/ha (PRE); 12) s-metolachlor + clomazone + ethalfluralin at 1.4 + 0.88 + 0.27 kg/ha (PRE); 13) s-metolachlor + halosulfuron at 1.4 + 0.069 kg/ha (PRE); 14) s-metolachlor + halosulfuron/ halosulfuron at 1.4 + 0.046/ 0.046 kg/ha (PRE/ POST); and 15) s-metolachlor + fomesafen at 1.4 + 0.28 kg/ha (PRE). The experiment was a randomized complete block design with four replications. The plots were 9 by 3.6 m and consisted of 1 row of 'Libby's Select' processing pumpkins and 1 row 'Howden' jack o'lantern pumpkins. The plants were spaced 1.5 m apart between rows and 0.9 m apart within the rows. On June 20, the pumpkins were seeded and the PRE herbicide treatments were applied with a CO₂ pressurized tractor-mounted sprayer delivering 281 L/ha. The POST treatments were applied with the same sprayer on July 6. All POST treatments included 0.5% crop oil concentrate. On July 27, we rated pumpkin injury on a scale of 0 (no injury) to 100 (complete plant death). At the same time the number of pumpkin plants in each plot was counted. Weed control was rated on a scale of 0 (no control) to 100 (no weeds in the plots). On August 17, pumpkin injury and weed control were rated using the same scales. We harvested pumpkin cultivars separately. All mature (orange) pumpkin fruit were harvested, counted, and weighed. Data were analyzed using ANOVA and means separated using the Least Significance Difference Test ($\alpha = 0.05$). Clomazone + ethalfluralin + flumioxazin applied PRE caused greater than 50% injury to both pumpkin cultivars. When flumioxazin was applied as a PRE directed treatment there was no crop injury. Clethodim + halosulfuron POST applied alone caused 30 to 38% injury while clethodim applied POST did not cause significant pumpkin injury. On August 27 the 'Libby's Select' pumpkin treated with flumioxazin PRE had 22% injury while the 'Howden' pumpkin had 43% injury. No other herbicide treatment caused pumpkin injury. The dominant weeds were foxtails and large crabgrass (grass), common purslane, and *Amaranthus* species. On July 27, clomazone + ethalfluralin applied alone PRE did not control *Amaranthus* species and only provided 48 and 55% control of pigweed and grasses, respectively. S-metolachlor + fomesafen provided at least 90% weed control. Clomazone + ethalfluralin PRE followed by clethodim + halosulfuron POST controlled over 95% of the weeds. On August 17, s-metolachlor alone, s-metolachlor + fomesafen, or s-metolachlor + clomazone + ethalfluralin controlled greater 90% of the weeds. Clomazone + ethalfluralin PRE/ clethodim +

halosulfuron POST also controlled >95% weed control. At our site clomazone + ethalfluralin needs to be followed by POST applications of clethodim + halosulfuron to obtain consistent weed control but crop injury could be a problem. S-metolachlor will be a welcome addition to herbicides registered for pumpkin. It would provide good *Amaranthus*, grass, and common purslane control without injuring pumpkin. Further research is needed before flumioxazin PRE directed would have consistent weed control.