EFFECT OF SIMULATED SYNTHETIC AUXIN HERBICIDE DRIFT ON SNAP BEANS AND POTATOES

Jed Colquhoun, Daniel Heider and Richard Rittmeyer [1]

The potential introduction of agronomic crops resistant to synthetic auxin herbicides has stimulated a renewed interest in the potential off-target risk posed by these herbicides to nearby specialty crops. With this in mind, field research was conducted in 2011 and 2012 to determine the effect of simulated synthetic auxin drift on potatoes and snap (green) beans. In potatoes, simulated dicamba drift was evaluated at three rates (1.4, 4.2 and 7.0 g ae/ha) and two timings. In snap beans, 2,4-D and dicamba were evaluated individually at the same rates described above but at one application timing. In 2011, when dicamba was applied to 25 cm tall potatoes, visual injury 10, 24 and 30 days after treatment (DAT) increased with application rate, but by 38 DAT injury was greater than in the non-treated control only at the highest application rate. Potato tuber size distribution was variable and total yield did not differ among treatments and the non-treated control in 2011. In 2012, tuber size distribution was again variable, but more non-marketable cull potatoes were harvested where dicamba was applied at the highest rate to 25 cm potato plants than from any other treatment. In snap beans in 2011, injury from dicamba 7 DAT ranged from 19% at the low application rate to 45% at the high application rate. By 18 DAT in 2011, injury from 2,4-D was similar to the non-treated control. However, early-season injury in 2011 delayed snap bean flowering and reduced crop yield compared to the non-treated control for all treatments except where the lowest rate of 2,4-D was applied. Snap bean injury from dicamba was greater than that from 2,4-D at all visual rating timings in 2011 and two of three rating timings in 2012, and crop yield was reduced compared to where 2,4-D was applied and the non-treated control in both years.

Weed resistance to herbicides should be considered in a stewardship program in addition to practices that reduce risk of off-target herbicide movement. The selection pressure for resistant weeds can be reduced in most cases through rotation of herbicide modes of action, integration of alternative weed management strategies and elimination of weed escapes prior to seed production. Continuous use of the same herbicide active ingredient or mode of action in a corn-soybean rotation would increase the potential for selection of resistant weeds.

[1] Professor, Senior Outreach Specialist, and Senior Research Specialist; Department of Horticulture, University of Wisconsin-Madison, 1575 Linden Drive, Madison, WI 53706.