

RESEARCH SUMMARY

WEED CONTROL IN PROCESSING VEGETABLES (2018)

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Tolerance of Lima Bean to Herbicides.

Two trials were kept weed-free to test for the effect of pethoxamid, a new preemergence herbicide under development for field crops. We also examined the tolerance of lima bean to Zidua, Prowl H20, and Shieldex (tolpyralate). Though plant height, dry weight and yield was not less than the untreated check in any of the treatments, some injury symptoms (leaf puckering and plant stunting) was observed early in the growing season. By crop maturity, lima bean had outgrown the injury.

Tolerance of Snap Bean to Herbicides.

Two trials were kept weed-free to test for the effect of pethoxamid, a new preemergence herbicide under development for field crops. We also examined the tolerance of snap bean to Zidua, Prowl H20, and Shieldex (tolpyralate). Though yield was not less than the untreated check in any of the pethoxamid treatments, some injury symptoms (leaf puckering and plant stunting) was observed early in the growing season. Snap bean yield was less than the untreated check in the Shieldex treatments, despite showing little visible injury (ie. 7% or less) and no reduction in plant height.

Herbicide Tolerance in Carrots

Two trials were established to develop management strategies for control of linuron-resistant pigweed in carrot.

Pyroxasulfone (Zidua®) is an excellent candidate for control of linuron-resistant pigweed; therefore studies were established in mineral and muck soils to determine tolerance of carrot to postemergence applications of pyroxasulfone. As Zidua® rate increased from 105 to 588 g/ha at the early application timing (ie. 2-3 leaf), injury increased from 1-16%, and 0-46% at 7 and 28 days after herbicide treatment (DAT). Visible injury increased from 3-27% and 6-19% at 7 and 28 days after application at the 4-5 leaf stage of carrot. Despite the levels of injury that were apparent at either application timing, marketable yield was similar to the untreated check at most herbicide rates. Marketable yield was not reduced at a Zidua® rate of 100 g/ha. **A minor use was submitted, requesting a rate of 100 g/ha – additional data have been requested by PMRA on both tolerance and efficacy.**

The second trial was established to determine the tolerance of carrot to preemergence and early postemergence (2-3 leaf stage of carrot) herbicides for control of linuron-resistant pigweed in carrot,

The tank mixes of Dual II Magnum with Nortron or Prowl H2O (applied PRE) followed by micro-rates of Goal gave the best control of redroot pigweed, common lambsquarters and crabgrass. Visual injury was observed in those treatments where Nortron was included in the PRE application with either Goal or Blazer micro-rates at 7 and 28 days after treatment. Carrot yields were less than the untreated check in all treatments where Nortron was included in the PRE application. Carrot yield was greatest where the two-way tank mix of Dual II Magnum+Prowl H2O (PRE) were followed by Blazer micro-rates.

Tolerance of Processing Peas to PRE applications of Zidua

This trial was established to test for tolerance of eight pea cultivars ('Ricco', 'PAO 826', 'Lil Mo', 'Concept', 'Tyne', 'Sherwood', 'Reliance', and 'Sweet Savour') to preemergence applications of Zidua® at rates of 47 and 94 g/ac. Pea tenderness at harvest was rated using a tenderometer and final yield adjusted based on tenderometer readings. In addition, the level of weed control was rated in each treatment.

Visible injury was less than 10% in most pea cultivars at both rates of pyroxasulfone (Zidua®), except Tyne and Sherwood, which showed 14 and 17% visual injury at 28 days after emergence (DAE), respectively. Injury symptoms included leaf puckering and shortened midribs (drawstringing). Despite the injury in these two cultivars, pea tenderness ratings were all similar to the untreated check, an indication that pea maturity was not negatively affected. Finally, pea yield in all cultivars was similar to the untreated check. There was a tendency for pea yield to be slightly greater in the plots that had received herbicide treatment, associated with the presence of weeds competing for resources with the crop.

BASF will be approached to support a minor use for Zidua in pea – the herbicide offers residual control of Group 2 resistant eastern black nightshade, which would be a useful tool for pea growers.

Effect of Application Timing, Rate and Soil Type on Pea Tolerance To Flumioxazin

Three trials were established to determine pea tolerance to PPI and PRE applications of flumioxazin (Valtera) on sand, loam and clay loam soils. Valtera is a PPI or PRE herbicide with efficacy on Group 2 resistant black nightshade and common ragweed, and would be an excellent tank mix partner with Dual II Magnum. Though it is a residual herbicide, it does not have the same potential to carryover to vegetable crops as Pursuit. Valtera did not cause significant visual injury to pea, nor did it negatively impact pea maturity or yield.

Data were provided to PMRA to support the UMRULE submission for Valtera in peas that was initially submitted in 2015.

Tolerance of Pumpkins and Squash to Herbicides

The purpose of these trials was to determine the tolerance of pumpkin and squash to preemergence applications of Zidua, Prowl H2O, Shieldex (tolpyralate) and pethoxamid. Pethoxamid caused substantial injury to pumpkin- up to 56%; however, in 2018, it did not reduce the number of marketable pumpkins and yield. **In 2017, pethoxamid reduced pumpkin number by 54% and 40%, respectively. We hypothesize the reduction in pumpkin number and yield loss in 2017 was due to greater rainfall and cooler soil temperatures at time of emergence.**

Pethoxamid caused substantial injury to squash (23-50%), reduced the number of marketable squash by 44% and yield by 47%.