

2016 Onion Research Report

Weed Control in onion

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Preemergence and postemergence onion weed control experiments were conducted on muck soil in a grower field in 2016. A mineral soil experiment was conducted at another grower farm. The primary objectives for the 2016 onion research were: 1. Develop data and a use pattern for registration of pyroxasulfone (Zidua) on onion. 2. Develop data and a use pattern for use of bicyclopyrone (BIR) on onion. 3. Test currently registered and potential onion herbicides to find more effective methods for use on onion. 4. Obtain crop safety data for registration of clopyralid (Stinger) postemergence on onion.

Pyroxasulfone (Zidua 85 WDG) is a very long chain fatty acid synthesis inhibitor (WSSA/HRAC group 15 K3), similar to Dual Magnum in activity. It has different chemistry than Dual Magnum and is active at much lower rates. Zidua has been safe on onion when applied at 0.133 lb ai/acre preemergence and after onions have emerged. Zidua in sequence with Prowl H2O improved control of redroot pigweed and ladythumb over Prowl H2O alone. Zidua is active against annual grasses, common chickweed, common groundsel, common purslane, eastern black nightshade, and spotted spurge.

Bicyclopyrone is an HPPD inhibitor (WSSA/HRAC group 27F2). It appears to have sufficient selectivity for preemergence and postemergence application on onion on muck soil. In 2016, it was applied once or twice alone or with Prowl H2O, Buctril, or Chateau. In all tank mixes, it was safe preemergence on the onions. It was applied postemergence with GoalTender or after GoalTender. Onion yield was not reduced by bicyclopyrone treatment. Bicyclopyrone will improve control of annual grasses, common lambsquarters, common ragweed, eastern black nightshade, redroot pigweed, shepherdspurse, and wild radish.

Prowl H2O 1.9 lb ai plus Buctril 0.19 lb per acre applied preemergence followed by bicyclopyrone 0.033 lb plus Chateau 0.032 postemergence, and Prowl H2O 1.9 lb per acre plus Chateau 0.032 lb plus Buctril 0.19 lb per acre preemergence resulted in improved ladythumb and redroot pigweed control and high onion yields. If the ladythumb was not controlled very early in the season, it was not controllable with herbicides and had to be removed by hand.

GoalTender applied at 0.063, 0.125, and 0.25 lb ai (2, 4, or 8 fl oz) four times starting at the onion 1 leaf stage (1 LS) resulted in good onion yield and acceptable ladythumb and redroot pigweed control. Combining Chateau 0.032 (1 oz) with the first three applications of

GoalTender (1 LS, 2 LS, 3-4 LS) improved weed control with no yield reduction. Reflex 0.125 lb per acre applied at the 2 and 3-4 LS, after GoalTender at the 1 LS, was safe on onion and provided weed control similar to GoalTender alone. Since Reflex is similar chemically to GoalTender and controls many of the same weeds, four applications of GoalTender and two of Reflex would improve season-long postemergence weed control in onion.

Stinger improved control of ladythumb but set the onions back and reduced yield. It may be labeled for spot treatment control of composite weeds such as perennial sowthistle and Canada thistle.

On mineral soil, Prowl H2O was safe on onions at 0.95 lb ai (1 qt) per acre, and provided sufficient weed control for 3-4 weeks at that rate. Yield from this treatment was the largest in the mineral soil experiment. Zidua, bicyclopyrone, and Chateau caused serious crop injury and yield reduction when applied preemergence on mineral soil.

Zidua, bicyclopyrone, Reflex, and Stinger are moving through the registration process and should be labeled for use in onion within 2-3 years

GoalTender is labeled in Michigan for application at the onion 1 LS and later, with a maximum of 0.5 lb ai (16 fl oz) per acre per year. Onion growers should start their postemergence applications at the 1 LS to control difficult weeds such as common lambsquarters and ladythumb. When the weeds are under 0.5 inch tall, use at least 2 fl oz of GoalTender. If the weeds are over 0.5 inch, use 3-4 fl oz of GoalTender. The onions will survive and reach maximum yields after application and removal of the weeds. If the weeds are not killed, the onions will suffer yield reduction.