

Onion Weed Control Research Report 2018

Bernard Zandstra
Department of Horticulture
Michigan State University
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Two onion weed control experiments were conducted on muck soil on the Keilen farm in Lansing MI in 2018. Another trial was conducted on sand on the Vogel Farm in Fremont. An onion preemergence trial was planted three times at the MSU Horticulture Farm on a Marlette sandy loam soil. Only the final seeding had sufficient stand for a rating. It was seeded too late for a harvest.

Two leek and green onion trials were conducted on muck soil at the Schreur Farm in Hudsonville, and two leek and green onion trials were conducted on Jasper loam soil at the Van Drunen Farm in Momence, IL. A garlic trial was conducted at the MSU Horticulture Farm.

The objective of these trials was to obtain data to support registration of new products for onions and other members of crop group 3, Bulb vegetables. By obtaining crop safety data on several members of the crop group, we will be able to add several related crops to labels as the herbicides are registered for onion.

Another objective was to demonstrate the use of delayed preemergence applications to improve control of ladysthumb and other early-germinating weeds that are difficult to control in onion production. Other early weeds are common groundsel, marsh yellowcress, wild radish, and shepherdspurse. Early control of ladysthumb and other weeds has led to larger onion yields and less expense for hand or mechanical weed control. We hope to have labels for use of pyroxasulfone and bicyclopyrone on onion in the near future.

In the trials on muck at Keilen, delaying the first application of a preemergence herbicide plus **Moxy** (bromoxynil) improved ladysthumb control. Ladysthumb control was consistently better in the delayed preemergence plots all season. Hairy nightshade also was easier to control in delayed preemergence plots. By applying the **Moxy** after the first flush of weeds has emerged, the early weeds are killed and weed control may be maintained better with GoalTender and Chateau. If the weeds were not controlled until the onion 1 leaf stage (LS), it was very difficult to control them later. Many weeds had to be removed by hand.

Zidua (pyroxasulfone) applied preemergence at 0.133 lb/acre on muck soil was comparable to Prowl H2O 1.9 lb in crop injury ratings and yield. Higher rates of pyroxasulfone (0.186 and 0.267 lb ai/acre) suppressed onion yield. When pyroxasulfone was applied at the 2 LS or later, it was safe on the onions and provided excellent weed control. Pyroxasulfone generally controls all annual grasses and most broadleaves, except common lambsquarters.

Applying **GoalTender** at the 1 LS is essential to control all of the broadleaves. An application of 3-4 oz GoalTender at the 1 LS and again at the 2 LS provided a high degree of weed control. Waiting until the onion 2 LS to apply GoalTender resulted in many more weeds and onion yield reduction.

On sand at Fremont, all treatments were applied delayed preemergence. Pyroxasulfone at all rates caused stand reduction. The lowest pyroxasulfone rate (0.066 lb/acre) resulted in a 50% reduction in onion yield. At the 0.133 lb rate (the normal rate on muck) yield was reduced 70-80%. The poor stand

on loam soil at the Horticulture Farm did not allow an adequate estimate of yield. It appears that pyroxasulfone is too active for use on seeded onion on light mineral soils. Even when applied at the onion 2-3 LS, yields were reduced compared to onions treated with Prowl H2O.

Green onion was more sensitive to pyroxasulfone than seeded dry bulb onion. Yield was about 50% compared to the Prowl H2O treatments on muck soil. Leeks, however, were more tolerant of pyroxasulfone. At the X rate of 0.133 lb/acre preemergence, leek yield was not statistically different from leeks treated with Prowl H2O. When applied delayed preemergence, green onion yields from Prowl H2O and pyroxasulfone plots were similar.

On Jasper loam (Momence, IL), pyroxasulfone preemergence reduced green onion yield significantly. Leek had a poor stand in all plots, but pyroxasulfone resulted in lower yield than Prowl H2O.

In the garlic trial, garlic was tolerant of bicyclopyrone (BIR) applied in Fall 2017 or Spring 2018. Syngenta plans to collect more garlic use data in 2019 with the intent of labeling BIR in the future.

The pyroxasulfone registration package for crop group 3 (bulb vegetable crops) is at EPA. It may receive a tolerance and be labeled for use on onion and other bulb crops for 2020. There are no other changes in onion herbicide labels that I am aware of.