

Early Season Weed Control in Onions Prior to 2nd True Leaf Emergence

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Recently several post emergent and soil residual pre-emergent herbicides have been developed that could improve weed control prior to second true onion leaf emergence. Traditionally weed control in onions has been dependent on the use of oxyfluorfen (Goal 2XL) and bromoxynil (Buctril 4EC) tank mixes at the second true onion leaf. By this stage weeds are often too large to control without higher rates of these herbicides that can cause excessive crop injury. Several herbicides were evaluated in the Lancaster area for their applications to onions prior to the second true leaf. Most of these herbicides have been on the market for several years and now have new applications in onions.

Of the results from three trials conducted near Lancaster, the outstanding results were the safety and importance of the application of 24 oz. of Prowl H₂O at the onion loop stage. In Trial #3, 4 oz. of GoalTender was tank mixed with 24 oz. of Prowl and applied at the first true leaf that resulted in over 91% filaree control. In Trial #2 the tank mix of Prowl (24 oz) and Outlook (14 oz) at the third true leaf was a very safe and effective applications. From these results the optimal treatment is Prowl H₂O applied at the loop stage followed by 4 or 6 oz. of GoalTender applied at the 1st true leaf.

When 2, 4, 6, and 8 oz./ac. of Prowl H₂O were applied at planting, the 6 and 8 ounce treatments resulted in stunting that would be marginally tolerable. The 2 and 4 oz. rate resulted in a lack of weed control. The issue of crop injury with Prowl H₂O when applied at planting is important because of our sandy soils. Prowl is a growing point inhibitor and soil residual herbicide. Soils have exchange sites that these soil residual chemicals bind to. Sands have less of these exchange sites to tie up the chemical so more is free in the soil to either suppress germinating weeds, or the crop. If the plants are stunted and delayed in their growth, it could possibly result in yield loss. Onion yield was not measured from these treatments but needs to be evaluated. However, since Prowl is a growing point inhibitor, once the onion plant emerges it will not be affected by the herbicide. This is why the onion loop stage is the most favorable stage for the application of Prowl.

Prefar caused too much injury in this trial. GoalTender (4 oz) applied at the loop stage is too early and caused 40% stand loss. Outlook applied at 10 oz. at the first true leaf, 4E, Eptam and Chateau 51WD caused excessive onion injury beyond production standards.

Buctril was applied at a rate of 4 oz and 6 oz./ac. without significant onion injury and good weed control in Trial #2. However these applications were experimental and results may differ when the material is applied through sprinklers.

GoalTender is a new formulation of Goal 2XL that was registered for use in onions in 2004. GoalTender has nearly double the amount of active ingredient (41% oxyfluorfen) than the older formulation, Goal 2XL (23% oxyfluorfen). GoalTender is known to cause much less crop injury than traditional applications of Goal 2XL and Buctril. Research has shown that early applications of GoalTender, at low rates of 4 to 6 oz around when the 1st true leave is $\frac{3}{4}$ to fully expanded are more effective in controlling weeds with less crop

damage. Weed control is often better with earlier GoalTender applications because the weeds at this time are smaller (less than 2 to 3 inches in size) and easier to kill.

Summary:

GoalTender applied at the first true onion leaf stage at 6 oz. provided the best weed control with the least onion injury in this trial. The traditional tank mix combinations of Goal 2XL and Buctril 4EC resulted in greater onion injury with weed control similar or less than that of GoalTender applied at the first true leaf. Although GoalTender applied at 8 oz. at the first true leaf provided the best weed control, this rate causes significant stand loss and injury. These results show the decreased effectiveness on weeds when it is applied at the second true leaf, even at the 8 oz. rate. These results show that GoalTender can provide good weed control with significantly less onion injury when it is applied at the first true onion leaf stage while weeds are small. This effect is due to poor weed tolerance to herbicides and the residual weed control effects of GoalTender following the application. Further research needs to be conducted to assess the effectiveness of GoalTender applied through sprinklers on a larger scale and with certain problematic weeds such as lambsquarters.