

## **Can Overlapping Residuals Improve Weed Control in No-Till Pumpkins**

*A research project funded by the Pennsylvania Vegetable Marketing and Research Program*

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### **Introduction**

Weed control in pumpkins is challenging for many reasons, including the production practices of wide rows, no-till which excludes the use of cultivation, long growing season, and limited number of herbicide options. These practices result in a greater reliance upon herbicides for weed control. Unfortunately, there are very few herbicides labeled for postemergence weed control in pumpkins, so novel uses of soil-applied herbicides need to be explored. One approach used in soybeans to improve overall weed control is applying a second residual herbicide over the top of the emerged crop, but before the weeds have begun to emerge. This approach is referred to as overlapping residuals.

Dual Magnum is a common residual herbicide labeled for numerous crops, but not labeled pre-emergence in pumpkins. (Note: Dual Magnum is only labeled for between pumpkin row applications, not as a broadcast spray). Greenhouse trials at the University of Delaware (UD) have demonstrated very good crop safety if Dual is applied to pumpkins after they have emerged, while Prowl caused significant injury. Field trials at UD with soybeans have found Dual to provide better residual control in this approach compared to similar herbicides.

Dual Magnum will not control emerged weeds but weed control efficacy may be extended if it is applied sequentially, before the first herbicide dissipates. Preliminary UD studies found sequential applications made 4 to 5 weeks apart allowed too many pigweeds to emerge, so shorter time intervals need to be explored.

### **Objective**

Evaluate potential of Dual Magnum as an overlapping residual approach for pumpkin production throughout the Mid-Atlantic Region. This study is being conducted at the Western Maryland Research & Education Center in Keedysville, MD, the Penn State Research & Education Center in Rock Springs, PA, and at the University of Delaware Research & Education Center in Georgetown, DE.

### **Methods**

A cover crop of rye and vetch was rolled and burned down with glyphosate on May 29. Pumpkins were direct seeded two weeks later on June 12. Curbit was applied PRE on June 14. Dual Magnum was applied at 2, 3, or 4 weeks after planting (WAP) at a low (0.75 pt/A) or high (1.5 pt/A) rate. An untreated control and weed free treatments were also included for comparison (Table 1).

Plots treated with Curbit only (treatment 1) were monitored weekly starting two weeks after planting to document the emergence pattern of key weeds. All plots were evaluated visually for weed control and pumpkin response. Fungicides and insecticides were applied as needed.

### **Results**

Pumpkins did not show injury response from over-the-top application of Dual from any of the application rates or timings. While a complete statistical analysis has not yet been finished, there are a few observations that were made. Crabgrass, goosegrass, foxtail, pigweed, and purslane were the most common weeds present. Most treatments provided fair control (Figure 1.) Horsenettle was also present, but none of the herbicide treatments controlled it.

Adding Dual as a second residual improved weed control compared to Curbit alone (Figure 2). At 4 WAP, there was a peak in the number of weeds that had emerged (Figure 3). Since Dual does not control emerged weeds, waiting to apply Dual at 4 WAP will result in weed escapes. Applying Dual at 2 or 3 WAP may provide better weed control, since those applications are before the peak weed emergence. At 5 WAP, the number of emerged weeds had only decreased by 2%; however, at this point, the pumpkins are starting to provide canopy, which will provide shading and competition, reducing weed emergence and vigor. In general, the higher rate of Dual provided slightly better weed control than the lower rate. Yield data will be collected in the fall. Once this study is complete, the combined data from Maryland, Pennsylvania, and Delaware will be analyzed.

Table 1. Pumpkin treatment List.

Trt No.	Treatment	Rate	Unit	Timing*
1	Curbit	48	fl oz/A	PRE
2	Curbit	48	fl oz/A	PRE
	Dual Magnum	0.75	pt/A	2 WAP
3	Curbit	48	fl oz/A	PRE
	Dual Magnum	0.75	pt/A	3 WAP
4	Curbit	48	fl oz/A	PRE
	Dual Magnum	0.75	pt/A	4 WAP
5	Curbit	48	fl oz/A	PRE
	Dual Magnum	1.5	pt/A	2 WAP
6	Curbit	48	fl oz/A	PRE
	Dual Magnum	1.5	pt/A	3 WAP
7	Curbit	48	fl oz/A	PRE
	Dual Magnum	1.5	pt/A	4 WAP
8	Curbit	48	fl oz/A	PRE
	Reflex	1.5	pt/A	PRE
9	Weed Free			
10	Untreated			

\*PRE – preemergence; WAP = weeks after planting

Figure 1. Weed control ratings on August 12. (WAP = weeks after planting.)

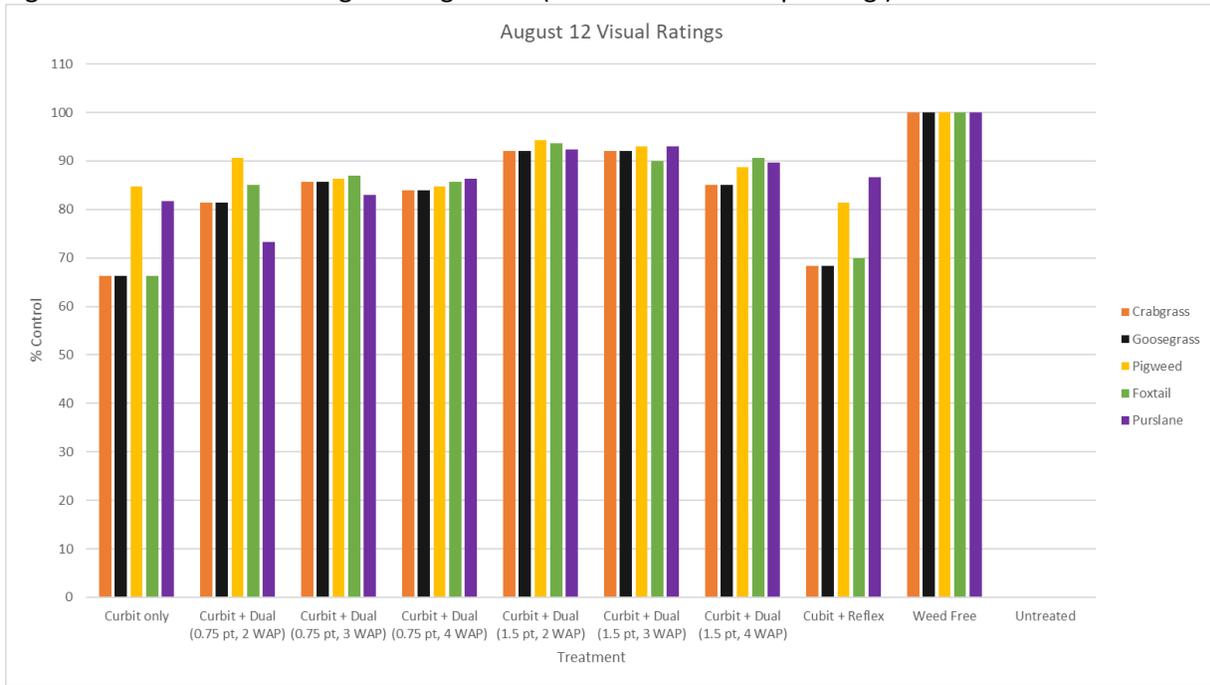


Figure 2. Comparison of Curbit only (left) and Curbit + Dual (1.5 pt, 2 WAP).



Figure 3. Percent of total weeds emerged by date.

