

## **New weed control methods for leafy greens**

### **Final Report**

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#### Take home message

We evaluated the effect of Dual Magnum and Spartan applied as pre-emergence (PRE), and Command and Spartan applied as post-emergence (POST) to weeds and crops tested. Research about possible herbicides to test was done, but unfortunately there were no good candidates for field research based on data from other experiments. All treatments caused some crop injury in the means of stunting or stand reduction. The lowest rate of Dual Magnum showed the lowest injury and some of the higher yields. Collards were very sensitive to all treatments and had low yields overall. Leaf chlorosis from Command was still visible at harvest.

#### Methods

One experiment was established at the OARDC Horticultural Unit in Wooster to develop data supporting expansion of some current registered herbicides, and identification of new herbicides for control of weeds in mustard, collards and kale. The experimental design was a randomized complete block with four replications. The varieties used for mustard, collards and kale were 'Green Wave', 'Georgia Southern' and 'Dwarf Blue Scotch' respectively. Herbicides tested in the experiment included: Dual Magnum, Spartan and Command, applied as pre and post-emergence.

Plots were comprised of 1 row of each crop tested for a total of 3 rows, row width was 3 ft. Plots measured 15 ft L x 9 ft W. Crops were seeded on 6/1/2020 using an Earthway push seeder. PRE treatments were applied on 6/2/2020 and POST treatments on 6/23/2020. Plots were evaluated and 1, 2 and 4 weeks after PRE and POST treatments were applied. Harvest took place on 7/13/2020, crop stand and fresh weight data was collected from the middle 5 ft of each row.

#### Results

All pre-emergence (PRE) treatments provided good weed control up until 2 weeks after treatments (WAT) were applied. Significant crop injury was observed in plots treated with Spartan (PRE) at 1 and 2 WAT and crop stands and yields were reduced. These results are consistent with results from 2019 research on mustard greens. Dual Magnum at 0.66 pt/A showed comparable weed control to the 1.33 pt/A rate. Crops treated with both rates of Dual Magnum showed lower injury in comparison to other treatments, plots treated with the lower rate (Trt 3 and 10) had higher stand counts.

Injury symptoms caused by Dual Magnum (PRE) were most notable 2 WAT, but all crops recovered over time and trended towards the highest crop stands and fresh weights at harvest. All rates tested for Command showed poor weed control at 2 WAT. Foliar chlorosis was observed in all plots treated with Command. Kale and mustard stands and fresh weights were not affected by the crop injury caused by Command (Table 1).

**Table 1. Response of kale, mustard and collard greens to PRE and POST herbicide applications.**

Trt No.	Treatment	Rate	Timing	Overall Weed Control %			Crop Injury %					Stand count (number)			Fresh weight (kg)		
				6/8/2020	6/15/2020	7/8/2020	All crops	All crops	Kale	Mustard	Collards	Kale	Mustard	Collards	Kale	Mustard	Collards
							6/8/2020	6/15/2020	7/8/2020	7/8/2020	7/8/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020	7/13/2020
1	Untreated	.	.	0 b	0 c	0 e	0 b	0 b	0 b	0 a	0 a	25 a	52 ab	16 ab	0.069 a	0.401 a	0.063 b
2	Dual Magnum	1.33 pt/a	PRE	100 a	96 ab	65 bc	5 b	38 ab	0 b	0 a	0 a	29 a	33 abc	14 ab	0.151 a	0.716 a	0.127 ab
3	Dual Magnum	0.66 pt/a	PRE	93 a	91 ab	45 cd	0 b	38 ab	0 b	15 a	8 a	27 a	53 ab	14 ab	0.139 a	0.574 a	0.124 ab
4	Spartan 4F	3 fl oz/a	PRE	100 a	93 ab	90 a	73 ab	68 ab	24 ab	29 a	39 a	17 a	21 bc	6 bc	0.125 a	0.396 a	0.067 b
5	Spartan 4F	6 fl oz/a	PRE	100 a	99 a	94 a	88 a	88 a	10 ab	23 a	34 a	13 a	14 c	3 c	0.126 a	0.383 a	0.073 b
6	Command	0.32 l/a	POST	.	.	10 e	.	.	28 ab	28 a	24 a	26 a	58 a	20 a	0.293 a	0.378 a	0.058 b
7	Command	0.47 l/a	POST	.	.	35 d	.	.	46 a	38 a	18 a	17 a	47 ab	16 ab	0.028 a	0.529 a	0.038 b
8	Command	0.63 l/a	POST	.	.	33 d	.	.	24 ab	29 a	6 a	26 a	50 ab	15 ab	0.088 a	0.503 a	0.052 b
9	Spartan 4F	3 fl oz/a	POST	.	.	46 cd	.	.	26 ab	26 a	25 a	19 a	45 ab	13 abc	0.050 a	0.300 a	0.046 b
10	Dual Magnum	0.66 pt/a	PRE	98 a	90 b	70 ab	20 b	30 ab	13 ab	18 a	6 a	28 a	57 a	13 abc	0.295 a	0.781 a	0.195 a
	Command	0.32 l/a	POST														
11	Spartan 4F	3 fl oz/a	PRE	100 a	91 ab	90 a	70 ab	70 ab	25 ab	26 a	21 a	15 a	26 abc	7 bc	0.104 a	0.419 a	0.039 b
	Command	0.32 l/a	POST														

Note: All plots were treated with Select Max at 16 fl oz/A on 7/1/20 for control of annual grasses.



Untreated



Dual Magnum 1.33 pt/A





Dual Magnum 0.66 pt/A



Dual Magnum 0.66 pt/A + Command 0.315 L/A