2016 Spinach Weed Control Evaluations

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Summary: These evaluations tested the efficacy and safety of Spin-Aid for use on spinach. The goal of these evaluations was to examine if lower rates of Spin-Aid applied at night can improve the safety of this material on spinach. If this proves to be the case, we hope to work with the registrant, Engage Agro, to consider modifying the label to allow the use of this material on clipped spinach. We observed that 1.0 pint of Spin-Aid applied at night reduced weed pressure by 53 to 95% over the standard preemergent treatment, but reduced the yield of spinach by 3 to 13%.

Methods: ***Trial No. 1.*** Conducted in San Juan Bautista in a commercial bunch spinach field planted on July 20. Spin-Aid was applied on July 29 with a CO_2 backpack sprayer making two passes of a one tip wand with an 8008EVS nozzles at 30 psi applying the equivalent of 83 gallons/A. Applications were made in the morning (9:30 a.m.) and in the evening (6:30 p.m.). Weed counts were made on two dates and a harvest evaluation was conducted on August 19. ***Trial No. 2.*** Conducted west of Salinas in a bunch spinach field planted on August 8. A two-bed wide strip by the length of the field (1,100 feet) was treated at night with a commercial tractor applicator applying one pint of Spin-Aid/A on August 18. Weeds and harvest biomass were evaluated on September 1 and 7, respectively. ***Trial No. 3.*** Conducted in San Juan Bautista in a bunch spinach field planted on September 12. The application was made at night with a commercial tractor applicator applying 1 pint of Spin-Aid on September 20. The application was made to the entire field except for a 5 bed strip. ***Practices for all three trials:*** All fields were direct seeded fields planted for bunch spinach production. Ro-Neet was applied in all fields at the rate of 2-3 pints/A. The applications of Spin-Aid were made early enough in the crop cycle to comply with the 21 day PHI, and as a result, the first true leaves were generally <1/8 inch long at the time of application. Harvest evaluations were conducted by harvesting replicated 0.5 m^2 quadrats from the plots. See tables for evaluations and dates.

Results: ***Trial No. 1.*** There were higher phytotoxicity ratings for the morning application of 2.0 pints/A of Spin-Aid than the evening application on both the August 2 and 12 evaluation dates (Table 1). There were no statistical differences between the 0.5 and 1.0 pint/A treatments between morning and evening applications. There were no statistical differences in the number of malva plants between rates of Spin-Aid or timing of application on either evaluation date. All treatments of Spin-Aid significantly reduced the number of nettleleaf goosefoot plants over the untreated control on both evaluation dates. There were no significant differences in yield between treatments, however, there is a trend indicating lower yields in the Spin-Aid treatments than in the untreated control. For instance, the yield of the 1.0 pint rate of Spin-Aid was 3% less than the untreated control. ***Trial No. 2.*** There were about 50% fewer weeds in the Spin-Aid treatment than the standard treatment on September 1 (Table 2). The yield in the Spin-Aid treatment was significantly less (6% less) than the standard treatment. ***Trial No. 3.*** There were significantly fewer malva plants in the Spin-Aid treatment than in the standard treatment (Table 3). The yield in the Spin-Aid treatment was significantly less (13% less) than the standard treatment.

Spin-Aid 2.0/A pints applied in morning note burn on cotyledon

Spin-Aid 2.0 pints/A applied in evening note no burning on cotyledons

Growth of malva (no Spin-Aid)

Spin-Aid treated (stunted malva)

Growth of purslane (no Spin-Aid)

Spin-Aid treated (fewer purslane)

Table 1. Trial No. 1. Weed counts (No./m^2) on two dates and yield evaluation on Aug 19

Spin-Aid/A	Timing	August 2				August 12				Aug 19
		Phyto	Malva	Nettleleaf Goosefoot	Total weeds	Phyto	Malva	Nettleleaf Goosefoot	Total weeds	Yield T/A
Standard	---	0.0	0.28	0.70	0.97	0.0	0.42	0.70	1.11	7.403
0.5 pint	Morning	0.0	0.37	0.00	0.37	0.7	0.19	0.09	0.28	6.856
1.0 pint	Morning	0.2	0.37	0.05	0.42	1.3	0.23	0.00	0.23	7.084
2.0 pint	Morning	2.0	0.23	0.09	0.32	3.3	0.05	0.05	0.09	6.441
0.5 pint	Evening	0.0	0.46	0.00	0.46	0.0	0.14	0.05	0.19	7.165
1.0 pint	Evening	0.3	0.32	0.00	0.32	1.2	0.05	0.00	0.05	7.181
2.0 pint	Evening	0.7	0.19	0.00	0.19	1.5	0.05	0.00	0.05	7.120
Pr>F treat		<0.0001	0.3770	<0.0001	0.0075	0.0001	0.4356	<0.0001	0.0025	0.0902
$LSD_{0.05}$		0.3	NS	0.12	0.34	0.9	NS	0.08	0.43	NS

Table 2. Trial No. 2. Weed counts (No./m^2) on Sept 1 and yield evaluation on Sept 7

Spin-Aid/A	Purslane	Nightshade	Shepherd's purse	Sow Thistle	Burning Nettle	Total weeds	Yield T/A
Standard	4.53	0.64	0.39	0.08	0.06	5.70	10.873
1.0 pint	2.50	0.14	0.00	0.00	0.03	2.67	10.257
Pr>F treat	0.0229	0.0612	0.0413	0.0257	0.3125	0.0121	0.0326
$LSD_{0.05}$	1.61	NS	0.36	0.08	NS	1.99	0.536

Table 3. Trial No. 3. Weed counts (No./m^2) on Oct. 7 and yield on October 24

Spin-Aid/A	Malva	Nettleleaf	Yield

		Goosefoot	T/A
Standard	1.25	0.00	14.749
1.0 pint	0.39	0.05	12.746
Pr>F treat	0.0193	0.3632	0.0048
$LSD_{0.05}$	0.06	NS	0.984