Screening compounds for preemergence weed control in spinach

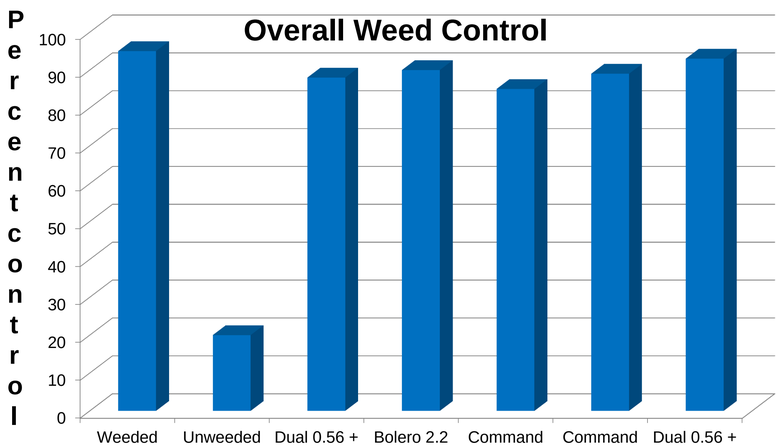
L. Brandenberger* and L. Carrier

Oklahoma State University, Stillwater, OK

Department of Horticulture and Landscape Architecture, 360 Agriculture Hall, Oklahoma State University, Stillwater, OK 74078

Introduction and objective:

Spinach is the fourth largest acreage vegetable crop grown within Oklahoma with over 700 hectares produced in 2007 for processing and fresh markets. Currently Dual Magnum (S-metolachlor) is the only preemergence herbicide labeled for use in commercial spinach within the state of Oklahoma. Having only one preemergence herbicide puts spinach at risk from the development of herbicide resistant weed species and increases concern over the potential loss of registration of Dual Magnum. Our objective was to compare different preemergence treatments to determine the level of crop safety and efficacy both separately and as tank mixes.



Methods

All treatments were applied preemergence following direct seeding. The six compounds included in the studies were: Dual Magnum-S-metolachlor, Lorox-linuron, Bolero-thiobencarb, Barricade-prodiamine, Command 3ME-clomazone, and Vida-pyraflufen ethyl applied alone and in combination for a total of 24 treatments plus both weeded and un-weeded checks.

2011 Spring Spinach weed control preemergence study, Bixby, OK. Emergence, injury, plant counts, weed control, and yield.

Treatment descriptions kg. ai/hectare	Emergence 4/12/2011 %	Injury 4/28/2011 %	Plant counts 5/3/2011 Plants/meter	Overall weed control 5/26/2011 %	Yield 5/31/2011 Metric tons per hectare
Dual Magnum 0.56	65 c [z]	15 c-f	69 a-b	88 a-d	8.5 a-d
Dual Magnum 0.73	79 a-c	13 c-g	69 a-b	91 a-c	6.9 b-d
Lorox 0.11	83 a-b	8 d-h	66 a-b	74 b-d	7.3 a-d
Lorox 0.22	75 a-c	18 c-d	63 a-c	70 d-e	4.2 d-f
Bolero 1.2	89 a	3 g-h	76 a-b	74 b-d	4.9 b-f
Bolero 2.2	89 a	8 d-h	86 a-b	90 a-c	9.7 a-b
Barricade 0.56	80 a-b	16 c-e	66 a-b	89 a-c	5.2 b-f
Barricade 1.2	74 a-c	60 a	23 d	94 a	1.8 e-f
Command 3ME 0.17	84 a-b	5 e-h	59 b-c	85 a-d	9.3 a-c
Command 3ME 0.34	80 a-b	5 e-h	83 a-b	89 a-c	9.4 a-c
Vida 0.0017	89 a	3 g-h	89 a	81 a-d	4.7 b-f
Vida 0.0034	86 a-b	11 c-h	83 a-b	73 c-d	4.5 c-f
Dual Magnum 0.56 + Lorox 0.11	88 a-b	8 d-h	66 a-b	91 a-c	6.0 a-f
Dual Magnum 0.56 + Lorox 0.22	81 a-b	34 b	63 a-c	88 a-d	6.0 a-f
Dual Magnum 0.56 + Bolero 1.2	85 a-b	3 g-h	63 a-c	88 a-d	7.4 a-d
Dual Magnum 0.56 + Bolero 2.2	79 a-c	14 c-g	69 a-b	90 a-c	8.0 a-d
Dual Magnum 0.56 + Vida 0.0017	83 a-b	5 e-h	69 a-b	88 a-d	10.8 a
Dual Magnum 0.56 + Vida 0.0034	75 a-c	20 c	73 a-b	83 a-d	5.9 a-f
Dual Magnum 0.56 + Command 3ME 0.17	83 a-b	4 f-h	73 a-b	88 a-d	7.9 a-d
Dual Magnum 0.56 + Command 3ME 0.34	83 a-b	6 d-h	59 b-c	93 a-b	9.4 a-c
Barricade 0.56 +Lorox 0.11	73 b-c	54 a	36 c-d	88 a-d	4.4 c-f
Barricade 1.2 +Lorox 0.11	75 a-c	56 a	17 d	98 a	1.2 f
Vida 0.0017 +Lorox 0.11	89 a	0 h	76 a-b	81 a-d	7.2 a-d
Vida 0.0034 +Lorox 0.11	86 a-b	9 c-h	76 a-b	55 e	6.5 a-e
Handweeded check	88 a-b	3 g-h	83 a-b	95 a	6.1 a-f
Weedy check	88 a-b	3 g-h	76 a-b	20 f	8.1 a-d

[z] Numbers in a column followed by the same letter exhibited no significant differences based on Duncan's Multiple Range Test where P=0.05.

Results and discussion:

Treatments had little effect upon emergence of spinach, but those containing Barricade recorded the highest levels of crop injury and lower plant numbers later in the season. Injury ranged from 16% for Barricade at 0.56 kg ai/hectare to a high of 60% for the 1.12 kg rate of Barricade. Barricade treatments at 1.12 kg ai/hectare also recorded the lowest yields (1.22 to 1.77 metric tons/hectare). The highest yielding treatment was Dual Magnum at 0.56 kg tank-mixed with Vida at 0.0017 kg ai/hectare (10.85 metric tons per hectare). Overall weed control was highest for Barricade at 1.12 kg tank-mixed with Lorox at 0.11 kg ai/hectare (98%), but several tank-mixes containing Dual Magnum, Lorox, Bolero, and Command 3ME also did well (90-93%). More detailed results will be available in January, 2012 at: http://www.hortla.okstate.edu/industry/vegetables/index.htm.