

Project Number: 13K 3419 7228

Title: Weed control in vegetable seed crops.

Personnel: Tim Miller and Carl Libbey, WSU NWREC

Reporting Period: 2006-07

Accomplishments: Two weed control trials in vegetable seed were conducted in 2006: one study each in table beet/Swiss chard seed and spinach seed. Weed control and/or crop injury was measured in each study. Additional vegetable seed crop trials conducted included an organic transition trial using spinach (funded by the WSU Center for Sustainable Agriculture and Natural Resources).

Results: Results will be presented at the Western Washington Horticultural Association meeting in January, 2007.

Spinach and table beet seedling herbicide screen. Spinach and beet were seeded June 12 at WSU NWREC. PRE treatments were applied June 14 and POST treatments of Spin Aid (1.8 pt product/a) were applied to half of each plot July 15. Weed control and crop injury were estimated July 22. Plants from one meter of row were pulled and fresh weight determined August 21. The trial was a split-block, randomized complete block with four replicates. Results are presented in Table 1. Treatments causing moderate crop injury to spinach and table beet were Define at 13.3 oz or more, and KIH-485 (10 to 12%). Weed control was generally increased by about 25% by using Spin Aid (POST) in addition to the base herbicide (PRE treatment). Best weed control was achieved with KIH-485 (89%) or Define at 13.3 or 16 oz/a (85%) followed by Spin Aid. Spinach fresh weight was not greatly affected by herbicide choice, as 10 of 14 treatments were statistically similar to the highest yield. Table beet fresh weight was similar, with 9 of 14 treatments statistically similar to the highest yield. These data indicate that KIH-485 and Define offer promise for future work in spinach seed. Everest and EPTC offered good selectivity, but rates should be increased in next year's trial.

Spinach seed. Spinach was seeded May 12 at WSU NWREC. Preplant-incorporated (PPI) treatments were applied May 9, preemergence (PRE) on May 16, and POST on May 30 and June 6, 9, and 14. Weed control and crop injury were estimated July 22. Surviving spinach plants were pulled in mid-August, dried in the field, and seed harvested using a plot combine September 7. Weight of threshed seed was determined September 12. The trial was a randomized complete block with four replicates. Results are presented in Table 2. Most treatments resulted in good crop safety but poor weed control. Exceptions included Dual followed by hand weeding (86% weed control) and by the micro-rate treatments based on Pyramin or Ro-Neet (86 and 78%, respectively). Seed yield for 16 of 22 treatments were not statistically different, indicating most treatments did not cause much spinach injury. Continued micro-rate testing should be included in next year's trial.

Table 1. Weed control in and fresh weight of spinach and table beet seedlings after treatment with several herbicides.

Treatment ^a	Rate product/a	Crop injury %	Weed control		Fresh weight	
			Spin Aid %	No Spin Aid %	Spinach g/m of row	Table beet g/m of row
Define	10.7 oz	9	69	44	598	1435
Define	13.3 oz	10	85	65	853	2197
Define	1 lb	10	85	70	973	2471
Everest	0.3 oz	6	54	31	649	1777
Everest	0.6 oz	6	60	34	606	2019
Everest	0.9 oz	6	60	29	684	1639
KIH-485	1.6 oz	12	89	74	1017	2305
Dual Magnum	8.4 fl.oz	8	75	51	878	2127
Dual Magnum + Define	8.4 fl.oz + 10.7 oz	9	79	55	1024	2379
Dual Magnum + Everest	8.4 fl.oz + 0.3 oz	7	76	55	1025	2063
Dual Magnum + KIH-485	8.4 fl.oz + 1.6 oz	8	69	35	743	1777
EPTC	1.8 pt	6	61	34	754	1551
EPTC	2.4 pt	6	59	28	535	1576
Weedy check	---	6	24	25	845	1887
LSD _{0.05}	---	4		25	342	742

^aMSO = methylated seed oil.

^bPPI = pre-plant incorporated; PRE = preemergence; P1 = postemergence, 1 day after emergence (DAE);

P7 = postemergence, 7 DAE; P14 = postemergence, 14 DAE; P21 = postemergence, 21 DAE.

^cCrop injury and weed control ratings taken July 22.

^dSpinach seed weight determined September 12.

Table 2. Weed control and spinach seed yield after treatment with several herbicides.

Treatment ^a	Rate product/a	Timing ^b	Weed control ^c %	Spinach seed weight ^d lbs/a
Ro-Neet + Pyramin	1.3 pt + 1.5 lb	PPI + PRE	51	3895
Ro-Neet + Dual Magnum	1.3 pt + 8.4 fl.oz	PPI + PRE	41	4329
Ro-Neet + Define	1.3 pt + 13.3 oz	PPI + PRE	61	4340
Ro-Neet + Spin Aid	1.3 pt + 1.8 pt	PRI + POST	44	3400
Nortron + Pyramin	4.6 fl.oz + 1.1 lb	PRE + PRE	44	4777
Nortron + Dual Magnum	4.6 fl.oz + 5.9 fl.oz	PRE + PRE	28	4052
Nortron + Define	4.6 fl.oz + 13.3 oz	PPI + PRE	51	3623
Nortron + Spin Aid	4.6 fl.oz + 1.8 pt	PRE + POST	41	4252
Pyramin + Dual Magnum	1.5 lb + 8.4 fl.oz	PRE + PRE	44	3673
Pyramin + Define	1.5 lb + 13.3 oz	PRE + PRE	71	4401
Pyramin + Spin Aid	1.5 lb + 1.8 pt	PRE + POST	34	3314
Dual Magnum + Define	8.4 fl.oz + 13.3 oz	PRE + PRE	54	3885
Dual Magnum + Spin Aid	10.7 fl.oz + 1.8 pt	PRE + POST	43	3460
Lorox	3.2 oz	PRE	40	3804
Lorox	6.4 oz	PRE	38	2737
Eptam	1.8 pt	PPI	0	2628
Eptam	2.4 pt	PPI	0	1843
Ro-Neet + (Progress + UpBeet + Stinger + MSO)	1.3 pt + (5.7 fl.oz + 1.3 fl.oz + 1.5%)	PPI + (P7, P14, P21)	78	3736
Nortron + (Progress + UpBeet + Stinger + MSO)	4.6 fl.oz + (5.7 fl.oz + 1.3 fl.oz + 1.5%)	PRE + (P7, P14, P21)	68	3598
Dual Magnum + (Progress + UpBeet + Stinger + MSO)	10.7 fl.oz + (5.7 fl.oz + 1.3 fl.oz + 1.5%)	PRE + (P7, P14, P21)	59	3561
Pyramin + (Progress + UpBeet + Stinger + MSO)	1.5 lb + (5.7 fl.oz + 1.3 fl.oz + 1.5%)	PRE + (P7, P14, P21)	86	4639
Dual 8E + hand weed	1 pt	PRE	86	4523
LSD _{0.05}	---	---	25	1282

^aMSO = methylated seed oil.

^bPPI = pre-plant incorporated; PRE = preemergence; POST = postemergence, 17 days after emergence (DAE); P7 = postemergence, 7 DAE; P14 = postemergence, 14 DAE; P21 = postemergence, 21 DAE.

^cWeed control ratings taken July 22.

^dFresh weight determined August 21.