Project Title: Dill tolerance to soil and foliar applied herbicides

Objectives: To evaluate the response of dill to preemergence and postemergence herbicides.

Materials and Methods:

The study was conducted under dryland conditions, using conventional tillage practices, with the previous crop being alfalfa. The soil type was Kalispell very fine sandy loam with a sand, silt, and clay content of 60, 25, and 15 percent, respectively. The soil had a CEC of 15, an organic matter content of 3 percent, and a pH of 7.0. The field was fertilized with 27-30-120-24 lb/A of N-P-K-S on April 2. Dill was seeded 0.25 inches deep on April 20, at a rate of 4 lb/A in six inch wide rows. Preemergence herbicide treatments were applied on April 21. Postemergence treatments were applied on June 7 when the dill seedlings were 1 to 3.5 inches tall. All herbicides were applied with a CO_2 backpack sprayer in 20 GPA of water using 11002 flat fan nozzles. The experiment was established as a randomized complete block with three replications, with each plot measuring 10 by 15 feet.

Treatments were visually rated for percent crop injury on June 25 and July 3, using a scale of 0 (no injury) to 100 (complete injury). Plant density and biomass were determined in each plot by collecting the above ground plant material from two, 1.5 ft^2quadrates on July 27. Plant height and days to flowering also were evaluated in order to further assess crop injury potential. Plots were harvested on August 24. Plots were hand-weeded to prevent weed competition from confounding yield results.

Results:

Crop injury varied from 0 to 67 percent, and generally occurred in the form of plant density reductions and delayed heading (Figures 1 and 2). Prowl, Lorox and Caparol showed the least amount of injury, while Cinch and Facet treatments resulted in more severe injury (Table 1).

Figure 1. Crop injury and plant density.

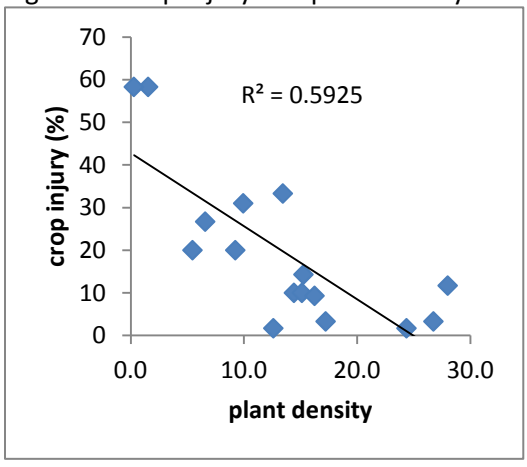
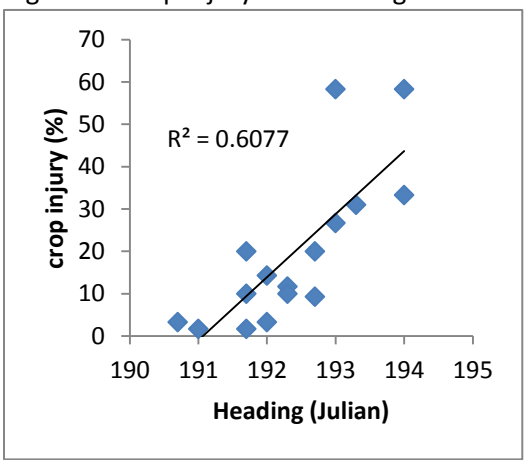


Figure 2. Crop injury and heading.



Herbicide treatment had no significant effect on yield. However, yields tended to decline as the rates of Caparol increased. In sum, all of the herbicides evaluated would appear to have potential for use in dill, especially with respect to the yields obtained. This study should be repeated over a range of different soil types in order to better assess the potential crop tolerance of these materials.

Table 1. Effect of herbicide and rate on dill yield, Kalispell, MT2010.

Herbicide	Rate lb ai/A	Crop Injury (%)		Heading Julian	Height (in)	Density (No./ft2)	Biomass (g/ft2)	Yield lb/A
		25-Jun	3-Jul		2-Aug	27-Jul	27-Jul	24-Aug
check		0	2	191	34.0	24.4	48.3	1970.6
Prowl	0.95	15	10	192	32.7	14.4	29.6	2657.6
Prowl	1.90	18	14	192	34.4	15.3	27.1	2826.3
Prowl	3.80	7	12	192	34.0	28.0	44.1	3069.0
Cinch	0.95	22	27	193	33.2	6.6	32.8	2365.6
Cinch	1.91	30	20	192	34.8	5.5	26.5	2945.6
Cinch	2.86	37	31	193	32.8	9.9	35.9	2501.3
Facet	0.25	32	33	194	33.7	13.4	41.0	2336.8
Facet	0.50	65	58	194	38.7	1.5	14.5	1752.6
Facet	0.75	67	58	193	37.8	0.3	0.7	1888.3
Lorox	0.25	7	2	192	31.9	12.6	34.7	2920.9
Lorox	0.50	10	10	192	33.7	15.1	25.6	3344.7
Lorox	1.00	8	20	193	29.1	9.2	24.6	2361.4
Caparol	0.50	3	3	191	34.0	17.2	43.2	3032.0
Caparol	1.00	0	3	192	30.9	26.7	47.2	2702.9
Caparol	2.00	8	9	193	32.7	16.2	29.1	1489.3
MIN		0	2	191	29.1	0.3	0.7	1489.3
MAX		67	58	194	38.7	28.0	48.3	3344.7
MEAN		21	20	192	33.7	13.5	31.6	2510.3
LSD (P=.05)		15.06	17.74	2.17	4.70	15.42	29.21	1198.66
CV		44.01	54.39	0.68	8.38	68.37	55.53	28.64
TRT (Pr > F)		0.0001	0.0001	0.1242	0.0540	0.0241	0.1638	0.1295