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Kochia infestation levels in proso millet as affected by planting date.

Anderson, R. L. Proso millet is a drought-tolerant crop that is well suited for a winter wheat-spring planted crop-fallow rotation in the drier areas of the Central Great Plains. No-till production systems have been developed for proso millet, but rely on the usage of atrazine for non-crop and in-crop weed control. Kochia is a major weed infesting proso millet, and has developed triazine-resistant ecotypes. Proso millet matures in 60 to 80 days, thus, wide latitude exists in choosing when to plant proso millet. The objective of this study was to determine if varying the planting date of proso millet influenced the level of kochia infestation within the crop.

'Cope' proso millet was planted with a hoe drill on three dates: May 15, June 3, and June 22, 1987. Two production systems, conventional tillage and no tillage, were compared. The conventional tillage system included disking prior to planting with atrazine applied preemergence. With the no tillage system, atrazine was applied after wheat harvest the previous fall and paraquat plus surfactant was applied prior to planting. A randomized split-block design was used with 4 replications. Kochia seedlings in each plot were recorded 6 weeks after planting for each date.

Disking the soil prior to planting reduced kochia seedling establishment in the crop compared to the no tillage systems (Table 1). Planting date also influenced kochia establishment, as an average of only 1.4 plants/8 yd<sup>2</sup> were established in proso millet planted on June 22, compared to 13.5 plants/8 yd<sup>2</sup> in proso millet planted on May 15. Table 2 gives the environmental data following each planting date. The major difference occurred with soil temperature. Kochia germination appeared to decrease when soil temperatures approached 75°F, as precipitation levels were similar between the first and last planting dates. Yield data for proso millet was not collected as the plant stand was destroyed by hail on August 4, 1987. These results indicate that altering planting date may be a management tool for reducing weed competition in proso millet. Also, kochia germination and establishment appears to be strongly influenced by tillage operations in this climatic area. Producers using a no-till production scheme will have a more severe kochia infestation level when planting early, thus possibly requiring a postemergence broadleaf weed herbicide to ensure a successful crop cycle in this drought-prone region. (USDA-ARS, Akron, CO 80720).

Table 1. Number of kochia plants infesting proso millet planted at three dates

Tillage system	Herbicide treatment (lbs/ac)	Planting date			Mean
		May 15	June 3	June 22	
		----- plants/8 yd <sup>2</sup> -----			
Conventional tillage	atrazine 0.5 (spring)	1.6	0.6	0.1	0.8
No tillage	atrazine 1.0 (fall) <sup>1</sup>	12.9	5.1	0.5	6.2
No tillage	atrazine 1.25 (fall) <sup>1</sup>	18.6	6.0	2.4	9.0
No tillage	atrazine 1.0 (fall) + 0.25 (spring) <sup>1</sup>	20.9	11.0	2.8	11.5
Mean		13.5	5.7	1.4	

LSD (0.05) interaction: NS  
LSD (0.05) planting date: 3.2  
LSD (0.05) herbicide treatment: 3.7

<sup>1</sup> Paraquat at 0.5 lbs ai/ac was applied before planting.

Table 2. Environmental data for the two week periods after planting

Planting date	Days after planting	Average daily temperatures		Precipitation in.
		Air °F	Soil (4 in. depth) °F	
May 15	0- 7	60	68	.97
	8-14	57	63	.98
June 3	0- 7	66	74	.48
	8-14	72	75	.29
June 22	0- 7	69	77	.94
	8-14	67	75	.86