Research Note

RESPONSE OF PIGEON PEA CULTIVARS TO PROMETRYN, METRIBUZIN AND IMAZETHAPYR[1]

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J. Agric. Univ. P.R. 86(1-2):69-71 (2002)

Prometryn and metribuzin are the most frequently recommended chemicals for weed control in pigeon pea [*Cajanus cajan* (L.) Millsp]. These two chemicals were found to be the best preemergence herbicides for weed control (Almodóvar and Vélez-Báez, 1980). Soil adsorption of both herbicides depends on soil properties such as cation exchange capacity, and clay, sand and organic matter content (Liu and Cibes, 1973). Therefore, the response of pigeon pea to these herbicides could be influenced by soil conditions. For example, irrigation regimes influenced phytotoxicity of prometryn to pigeon pea in a San Antón loamy soil but not in Corozal, Coto or Fraternidad clay soils (Liu, 1984).

Response of most of the new pigeon pea cultivars to prometryn and metribuzin under local conditions has not been reported, although two new cultivars (Cortada and Guerrero) were recently released (Bosque-Vega et al., 2000a; Bosque-Vega et al., 2000b. A field experiment was conducted at Juana Díaz Substation to evaluate injury and yield responses of five pigeon pea cultivars (including Cortada and Guerrero) to prometryn, metribuzin, and imazethapyr.

Seed of cultivars Blanco de Yauco, Cortada, Guerrero, PR 147, and Line 84 were planted 10 April 1996 at a spacing of 30 cm within rows, 91 cm between rows. Experimental units followed a split plot arrangement of a randomized complete block design with five treatments (cultivars), four subplots (three herbicides and the untreated hand-weeded check), and four replications. Main plots measured 7.3 m wide and 6.1 m long, with eight rows, 0.91 m apart. Subplots consisted of two rows, 6.1 m apart. Prometryn (4.48 kg ai/ha), metribuzin (1.12 kg ai/ha), and imazethapyr (0.14 kg ai/ha) were applied over the soil surface on 11 April 1996. The application rate for each herbicide corresponded to a 2X, where X equals the recommended rate. Rates were increased in order to detect potential crop injury. Crop injury was visually recorded at three and six weeks after planting (WAP), on the basis of a 0 to 10 rating scale, where 0 = no injury and 10 = pigeon pea plants completely affected. For yield determination, fresh pods of pigeon peas were harvested from two rows (11.1 m^2) 8 January 1997. Data were analyzed by using general linear models procedure for a factorial ANOVA, and means were separated by the protected LSD (0.05) test.

Emergence, leaf chlorosis, and plant stunting were the symptoms generally observed in pigeon pea seedlings. Cultivar by herbicide treatment interaction was significant for the injury ratings recorded at three WAP and 6 WAP (Table 1). Injury ratings from 0 to 2.0 were considered low phytotoxicity; from 2.1 to 4.0, moderate. The highest injury rating recorded at 3 WAP was in Cortada, followed by PR 147 and Line 84, all treated with metribuzin. Injury symptoms decreased at 6 WAP for all pigeon pea cultivars, except Cortada, which remained with the highest, but moderate, injury when

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TABLE 1.—*Mean injury ratings caused by preemergences prometryn (4.48 kg/ha), metribuzin (1.12 kg/ha), and imazethapyr (0.14 kg/ha) on five pigeon pea cultivars at Juana Díaz in 1996.*

	Mean injury ratings caused by herbicides[1]					
	3 WAP[2]			6 WAP[2]		
Pigeon pea cultivar	Prometryn	Metribuzin	Imazethapyr	Prometryn	Metribuzin	Imazethapyr
Blanco de Yauco	2.1 cd	2.4 bcd	0.4 g	0.4 b	0.5 b	0.0 b
Cortada	1.8 df	3.6 a	0.4 g	0.1 b	4.0 a	0.0 b
Guerrero	1.9 d	1.7 df	0.7 eg	0.2 b	0.4 b	0.0 b
PR 147	1.6 df	2.9 ab	1.0 e	0.0 b	1.0 b	0.0 b
Line 84	2.0 cd	2.5 bc	0.4 g	0.0 b	0.2 b	0.0 b

[1]Rating scale from 0 to 10, where 0 = no injury and 10 completely affected pigeon pea.
[2]Means in the three columns for each evaluation period followed by the same letter are not significantly different according to $LSD_{0.05}$ test.

treated with metribuzin. Imazethapyr seemed to be the least phytotoxic herbicide, since none of the cultivars showed foliage injury at 6 WAP.

Cultivar by herbicide treatment interaction was non significant for yield; thus, LSD test was used to compare means among herbicide treatments for individual cultivars (Table 2). Compared with non-treated check, imazethapyr did not significantly influence yield of the five pigeon pea cultivars. When pigeon pea was treated with prometryn and metribuzin, yields of all cultivars, except Cortada, were lower than that of the non-treated check. There were no significant differences in yield among herbicide treatments for Cortada. In spite of the injuries to vegetative growth caused by the increased herbicide rates, the five pigeon pea cultivars showed little or no yield reduction. All yields can be considered within the expected range for this crop. The five pigeon pea cultivars here

TABLE 2.—*Mean yields from five pigeon pea cultivars treated with preemergences prometryn (4.48 kg/ha), metribuzin (1.12 kg/ha), and imazethapyr (0.14 kg/ha) at Juana Díaz in 1996.*

	Mean pigeon pea yields[1]				
Treatments	Blanco	Cortada	Guerrero	PR 147	Line 84
	kg/ha				
Prometryn	9,647 b	7,215 a	9,193 bc	6,879 b	6,489 c
Metribuzin	6,652 c	6,416 a	6,716 c	5,862 b	7,133 bc
Imazethapyr	11,652 ab	6,235 a	10,436 ab	9,828 a	9,601 ab
Non-treated	12,106 a	9,846 a	11,843 a	10,091 a	12,251 a

[1]Means in one column followed by the same letter are not significantly different according to $LSD_{0.05}$ test.

evaluated should not be significantly affected by prometryn, metribuzin, or imazethapyr when these herbicides are applied at the recommended rates.

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