Research Note

CHEMICAL CONTROL OF ECHINOCHLOA COLONUM *IN SWEET CORN*[1]

Sweet corn (*Zea mays* L.) is not grown commercially in Puerto Rico. Imports of canned sweet corn during 1982–83 amounted to 5.56 metric tons valued at more than $5.8 million.[2] Research conducted in 1970–73 indicates that excellent sweet corn yields can be obtained specially in winter plantings.[3,4] There is a potential for this crop in Puerto Rico. The effect of minimum tillage and preemergence herbicides on sweet corn cv. P.R. 50 was studied in 1978.[5] Results from that study indicated that simazine at 4.5 kg ai/ha ranked first in weed control (77%). It was followed by linuron at 1.7 kg ai/ha (72%) and atrazine at 4.5 kg ai/ha (69%). Sweet corn yield (12.9 metric tons per hectare) with simazine and atrazine (9.4 metric tons) were similar to hand-weeded check (12.9 metric tons). Atrazine, alachlor, dinoseb and propachlor were recommended for sweet corn since 1977.[6] At present a large number of herbicides are registered for weed control in sweet corn.[7]

This herbicide experiment on sweet corn cv. Hawaii 68 was conducted at the Lajas Research Center in 1981. The seeds were sown by hand 30 cm apart in rows 6.1 cm long and 92 cm wide April 20 1981. Plots consisted of four rows. The experimental layout was a partially balanced incomplete block design with 4 replications and 12 treatments. Alachlor (4.48 and 8.96 kg ai/ha) and atrazine + alachlor mixtures were applied 1 day after planting. The mixtures of atrazine + propachlor were applied April 30. Linuron (1.68 and 3.36 kg ai/ha) was applied as directed postemergence 4 weeks after planting. Data on weed control and crop phytotoxicity were recorded 4 and 7 weeks after planting. Total corn ears were harvested June 26, 1981.

[1] Manuscript submitted to Editorial Board March 13, 1986.

[2] Department of Agriculture, 1983. Facts and Figures on Puerto Rico Agriculture. 1981/82–1982–83.

[3] Domenech J. O. and G. Manual-Crespo, 1977. Performance of sweetcorn varieties and their response to planting season, J. Agric. Univ. P.R. 61:170–74.

[4] Mangual-Crespo G., 1977. Yield of two sweet corn hybrids in the Isabela area. J. Agric. Univ. P.R. 61(2):175–78.

[5] Almodóvar L., 1978. Annual Progress Report (Vegetable Crops). Agric. Exp. Stn. Univ. P. R.

[6] Estación Experimental Agrícola de la Universidad de Puerto Rico, 1977. Control Químico de las Malas Yerbas en los Cultivos Económicos de Puerto Rico. Univ. P. R. Publ. 89.

[7] Acín-Díaz, N., H. O'Farrill-Nieves y R. Montalvo-Zapata, 1984. Plaguicidas con permiso de uso en hortalizas. Plaguicidas al Día. 5 (2):7–11.

TABLE 1.—*Effect of different herbicides on phytotoxicity, weed control and yield of sweet corn cv. Hawaii 68*

Treatment	Rate	Crop injury[1]	Weed Control[2]		No. of weeds[3]	Yield[3]	Ears/ha
			May 18	June 8			
	kg ai/ha	%	%	%	*0.5 m²*	*kg/ha*	
Alachlor	4.48	2.5	85	81	224 b	15,036 a	58,929 a
Alachlor	8.96	46.0	97	87	140 b	11,080 b	52,679 a
Atrazine/Alachlor	1.8/2.24	0.0	97	88	137 b	13,473 ab	67,857 a
Atrazine/Alachlor	3.6/4.48	13.0	98	90	109 b	14,027 ab	60,714 a
Atrazine/Propachlor	1.68/3.81	0.0	84	62	423 b	15,036 a	63,393 a
Atrazine/Propachlor	3.36/7.62	0.0	89	89	121 b	15,446 a	71,429 a
Cyanazine	4.48	67.5	91	80	224 b	6,205 c	29,464 b
Cyanazine	8.96	77.5	96	85	161 b	5,187 c	21,429 b
Linuron	1.68	0.0	—	84	181 b	11,536 ab	56,250 a
Linuron	3.36	0.0	—	81	207 b	12,054 ab	53,371 a
Hand-weeded check	—	0.0	93	81	207 b	14,205 ab	66,071 a
Non-weeded check	—	0.0	0	0	1105 a	4,018 c	25,893 b

[1] 0–100 rating scale (0 = no visible effect, 100 complete stand kill).

[2] Mean rating of four replications with 1 to 100 representing poor to excellent weed control.

[3] Means followed by the same letter do not differ significantly at P = .05 (paired *t* test).

The predominant weed species in the experimental area was jungle rice [*Echinochloa colonum* (L.)] with a mean population density of 1,047 plants/0.5 m^2. Secondary weeds were horse purselane (*Trianthema portulacastrum* L.) and spurge (*Euphorbia heterophylla* L.) with mean population densities of 38 and 20 plants per 0.5 m^2, respectively. Purple nutsedge (*Cyperus rotundus* L.) was not detected in nonweeded check plots, but its population density averaged 17 plants per 0.5 m^2 on herbicide treated plots. Table 1 presents data on crop phytotoxicity, weed control at two different dates and yield. Herbicide performance was measured mainly on the basis of jungle rice control. The atrazine + alachlor (1.8 + 2.24 kg ai/ha) mixture provided an excellent weed control with no crop injury. Alachlor at 4.48 and 8.96 kg ai/ha and the atrazine + propachlor mixtures provided good weed control with low level of phytotoxicity to sweet corn. Cyanazine was highly phytotoxic. Alachlor at double the recommended rate performed well but caused stunting. Weed counts on treated plots 7 weeks after planting were lower than on untreated check. Sweet corn yield and number of ears/ha was significantly lower in nonweeded check and cyanazine-treated plots. The highest corn yields were obtained with alachlor at the rate of 4.48 kg ai/ha (15,036 kg/ha) and the atrazine + propachlor mixtures (15,036 kg/ha at single rates and 15,446 kg/ha at double rates). In general, excellent sweet corn yields with a high number of ears/ha were obtained, comparable to those reported by Domenech et al.[3] and Mangual-Crespo.[4] Our experimental results show it is feasible to grow sweet corn if chemical herbicides are used.

Nelson Semidey
Luis Almodóvar
Department of Crop Protection