

Research Note

CHEMICAL CONTROL OF WEEDS IN PLANTAINS

(*Musa acuminata* × *M. balbisiana*, AAB)¹

Plantain is the most important starchy crop in Puerto Rico, with a farm value of \$21.6 million for 1974-75, when nearly 6,500 ha were harvested.

Traditionally, plantain has been grown in family-size farms with a limited use of hired labor to perform field work, including weed control. During the last few years, however, a dramatic increase in acreage, together with an increasing scarcity of hand labor, have accelerated the demand for herbicides as an alternative to hand weeding.

Published information pertaining to chemical weed control in plantains is lacking. On the other hand, there are several herbicides registered for use in bananas (*Musa acuminata* × *M. balbisiana*), including Dalapon,² Diuron, Ametryne, and Gramoxone.³ A recent communication from the Environmental Protection Agency to the Agricultural Experiment Station of Puerto Rico authorizes use in plantains⁴ of herbicides registered for bananas.

Two registered (Diuron and Ametryne) and two unregistered (Metribuzin and Prometryne) herbicides at three rates each were evaluated for weed control on plantain cultivar maricongo in an Ultisol in the humid mountain zone in the Corozal area. The experiment consisted of 14 treatments and 5 replications in a complete randomized block design. There were both hand-weeded and unweeded controls. Herbicides were broadcast as a spray immediately after planting. All cultural practices for plantain culture were conducted according to commercial standards for the zone, including fertilization and pest control. Field plots consisted of nine plants planted 2 m × 2 m. Yield data were obtained from the inner four plants.

Table 1 shows percent weed control at 100 days after treatment application, percent of plantain plants affected from applied herbicides, and yield of plantain fruits. In general, weed control was very good in all

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² Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guarantee or warranty of equipment or materials by the Agricultural Experiment Station of the University of Puerto Rico or an endorsement over other equipment or materials not mentioned.

³ USDA Summary of Registered Agricultural Pesticides Chemical Uses, 3rd ed.

⁴ Written statement from Mr. R. M. Califre, Pesticide Program Officer, to Dr. J. Román, Director of Entomology Department, Agricultural Experiment Station, Río Piedras, P.R., dated November 4, 1975.

herbicidal treatments. Herbicide performance was aided by a prolonged drought during the early stages of the experiment which also checked weed growth. Most prominent weed species included *Urena lobata*, *Panicum maximum*, *Commelina* spp., *Ipomoea* spp., *Momordica charantia*, and *Emilia conchiflora*.

The percent crop injury, which includes all visibly affected plants

TABLE 1.—Effect of pre-emergence herbicide treatments on weed control, crop injury, and plantain yield, Corozal

Herbicide	Rate	Weed control at 100 days		Yield of plantains	
	Kg/ha	%	% ¹	Fruits/bunch	Kg/bunch
Ametryne	2.24	82	2.2	43.4 ab ²	11.8 abc
Ametryne	4.48	89	4.4	43.7 ab	12.8 ab
Ametryne	8.96	93	6.6	36.4 bc	8.4 c
Metribuzin ³	2.24	89	13.2	42.3 ab	11.8 abc
Metribuzin ³	4.48	95	44.4	44.1 ab	9.5 bc
Metribuzin ³	8.96	95	48.4	33.7 c	11.9 abc
Diuron	2.24	77	2.2	46.8 a	14.0 a
Diuron	4.48	81	20.0	43.7 ab	12.1 abc
Diuron	8.96	89	26.6	41.7 ab	12.9 ab
Prometryne	2.24	56	2.2	40.5 ab	9.7 abc
Prometryne	4.48	78	4.4	46.8 a	13.0 ab
Prometryne	8.96	88	4.4	44.8 a	13.8 a

¹ Percent of plantain plants affected by herbicides.

² Treatment means with one or more letters in common do not differ significantly at the 5% level of probability.

³ Marketed as Sencor and Lexone by Chemagro and Du Pont, respectively.

TABLE 2.—Rate of herbicide degradation in soil

Herbicide	Rate	Herbicide residue in soil, p/m			
		Months after application			
		4	8	12	17
Ametryne 80 WP	2.24	—	—	0.01	0.02
Ametryne 80 WP	4.48	0.23	0.09	.02	.04
Ametryne 80 WP	8.96	.62	.20	.05	.09
Diuron 80 WP	2.24	—	—	1.48	1.35
Diuron 80 WP	4.48	2.67	1.73	1.48	1.75
Diuron 80 WP	8.96	6.23	3.01	2.62	2.49

regardless of the severity, indicates Metribuzin, followed by Diuron, to be the most toxic herbicides to plantain plants. Ametryne and Prometryne were relatively innocuous to plantains.

Yield data as indicated by both number of fruits per bunch or weight per bunch showed that herbicide treatments had no significant effect on plantain yield, except for Metribuzin and Ametryne at 8.96 kg/ha, which caused a significant reduction in fruits and weight per bunch.

This rate is twice the recommended rate for Ametryne and possibly much more for Metribuzin, considering that 4.48 and 8.96 kg/ha caused a significant injury to plantain plants (table 1).

Chemical analyses showed no detectable residues of Metribuzin or Ametryne in the harvested fruits at the rates used. No chemical analyses were made for Diuron or Prometryne.

Studies on the rate of degradation of herbicides in soil up to 17 months after treatment application (table 2) showed Diuron to be much more persistent in soil than Ametryne. Metribuzin and Prometryne were not studied.

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