

## Research Note

### EVALUATION OF CLOMAZONE IN ARRACACHA AND CASSAVA<sup>1</sup>

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Arracacha (*Arracacia xanthorrhiza* Bancroft) and cassava (*Manihot esculenta* Crantz) are two root crops which are good sources of carbohydrate (Kay, 1973). In fiscal year 1994, local production was 544,316 kg and 589,676 kg with farm values of \$284,398 and \$173,332 for arracacha and cassava, respectively (P.R. Dept. of Agriculture, 1995). Since both are slow growing and long term crops, they require a weed free period for at least three months after planting to achieve high yields. Weed suppression by manual means is becoming too expensive for local farmers to make a profit on these root crops. Olivieri-Cintrón and Beale (1984) determined that oxyfluorfen gave 95% weed control in arracacha. Despite this result, this herbicide was not tested further because of crop injury problems. Beale (1983) also identified oxyfluorfen as the best candidate for further trials in cassava. The mixture of oxyfluorfen with alachlor also provided 95% weed control. Liu (1982) obtained 95% control of weeds in cassava with pre-plant glyphosate treatment. However, excessive crop injury resulted when glyphosate was followed as a postemergence. Ametryn effectiveness in arracacha was established by Del Valle (1990). For the time being, ametryn is the only effective registered herbicide for our major root crops. Since the manufacturer does not support the re-registration of ametryn, producers urgently need an alternative in these root crops. The effectiveness of clomazone has been reported in several horticultural crops, such as peppers, pumpkin and sweet potatoes (Weed Sci. Soc. of Amer., 1994). The objective of these experiments was to collect efficacy data of clomazone {2-[(2-chlorophenyl) methyl]-4,4-dimethyl-3-isoxaolidinone} needed for establishing a tolerance level of clomazone in arracacha and cassava for a possible registration.

The arracacha field experiment was conducted at Adjuntas substation (AES) on an Alonso clay with a soil pH of 4.8 and 2.52% organic matter. A randomized complete block design with four replications was used. The plot size was 6.1 m × 3.7 m. The experiment consisted of four treatments: 1) weedy check, 2) hand weeded check, 3) clomazone at 1.68 kg ai/ha, and 4) clomazone at 3.36 kg ai/ha. The arracacha cv. Criolla was planted 7 October 1994. Preemergence herbicide application was made three days after planting with a portable CO<sub>2</sub> pressurized backpack sprayer. Herbicide treatments were applied with 295 L/ha of water. Weed control was rated and phytotoxicity was evaluated one month after herbicide application. Pest and horticultural management followed the conventional practice. The crop was harvested 1 September 1995.

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TABLE 1.—Weed control and yields of arracacha and cassava at the Adjuntas and Corozal Substations.

Treatment	Rate	Arracacha			Cassava		
		Weed control <sup>1,2</sup>		Yield <sup>3</sup>	Weed control <sup>1,2</sup>		Yield <sup>3</sup>
		Grasses	Broadleaves		Grasses	Broadleaves	
kg ai/ha	----- % -----	kg/ha	----- % -----	kg/ha			
Weedy check	—	0c	0c	8,205a	0c	0d	7,765c
Handweeded	—	95a	95a	10,985a	100a	100a	12,366ab
Clomazone	1.68	90b	83b	15,054a	90b	80c	10,289bc
Clomazone	3.36	98a	95a	9,019a	98a	90b	16,286a

<sup>1</sup>Weed control ratings were made on a scale of 0 to 100; 0 = no control, 100 = perfect control.

<sup>2</sup>Evaluations were made one month after herbicide application.

<sup>3</sup>Means with the same letter do not differ significantly at P < 0.05 level of probability (Duncan Multiple Range Test).

The cassava experiment was conducted at the Corozal substation on a Corozal clay with a soil pH of 6.4 and 2.6% organic matter. The experimental design was the same as that used for the arracacha experiment. Plot size was 5.5 m × 4.9 m. Cassava 'Serrallés' was planted 5 October 1994. Preemergence herbicide was similarly applied two days after planting with the same application equipment. Weed control was rated and phytotoxicity was evaluated as in the arracacha experiment. Yield was obtained 13 September 1995. Data were analyzed by using means separation by Duncan Multiple Range test at  $P < 0.05$ .

The predominant weed species in the arracacha experiment were wild arrowroot (*Canna coccinea* Mill.), goosegrass [*Eleusine indica* (L.) Gaertn.], common purslane (*Portulaca oleraceae* L.), cadillo (*Urena lobata* L.), fireweed [*Erechtites hieracifolia* (L.) Raf ex DC.], junglerice (*Echinochloa colona* L.), spreading dayflower (*Commelina diffusa* Burm. f.), and purple nutsedge (*Cyperus rotundus* L.). Clomazone at the rates of 1.68 and 3.36 kg ai/ha gave 90 and 98% control of grasses, respectively (Table 1). It provided 83 and 95% control of broadleaf weeds at the same respective rates. This herbicide had temporarily caused minor arracacha injury in the form of white bleached spots on leaves of some plants. This symptom was later outgrown. The highest commercial yield of arracacha was 15,045 kg/ha but it was not different from that of other treatments.

The predominant weed species in the cassava experiment were wild poinsettia (*Euphorbia heterophylla* L.), junglerice (*Echinochloa colona* L.), large crabgrass [*Digitaria sanguinalis* (L.) Scop.], spreading dayflower (*Commelina diffusa* Burm. f.), beggar weed [*Desmodium tortuosum* (Sw.) DC], signalgrass [*Brachiaria platyphylla* (Griseb) Nash] and purple nutsedge (*Cyperus rotundus* L.). Clomazone at rates of 1.68 and 3.36 kg ai/ha gave 90 and 98% control of grasses, respectively, but it was less efficient on broadleaf weeds (80 and 90%, respectively). No cassava injury was observed during the crop cycle. Use of clomazone at the rate of 3.36 kg ai/ha resulted in the highest commercial yield of all treatments. This treatment differed from treatments of clomazone at the rate of 1.68 kg ai/ha and the weedy check. In view of the promising results obtained, clomazone could be used as a substitute for ametryn on these two root crops. The continuation of testing of clomazone is needed with a formal protocol toward the goal of its registration for use in both arracacha and cassava.

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