

## Research Note

### CONTROL OF PURPLE NUTSEDGE (*CYPERUS ROTUNDUS L.*) WITH DPX 4129<sup>1</sup>

Purple nutsedge (*Cyperus rotundus* L.), known locally as "coquí," is considered the most noxious of all tropical weeds; it is widely distributed in Puerto Rico, common in cultivated fields such as sugarcane, perennial crops, pastures, ditchbanks, roadsides, and lawns.

There are few references on the control of purple nutsedge in Puerto Rico. The effectiveness of several chemicals was tested by Loustalot et al.<sup>2</sup> These authors found that repeated treatments of shoots with 2,4-D over a long period, during which time the ground remained fallow, reduced but did not eradicate the tubers. Of the three fumigants tested—chloropicrin, ethylene dibromide and methyl bromide—the latter was by far the best from the standpoint of effectiveness and economy. One-half pound of methyl bromide, applied to 100 square feet of plowed soil covered with a gas tight cover for 48 hours, killed all the nutgrass tubers to a depth of 9 inches. Good control was found with CMU at 20 pounds per acre. Pentachlorophenate, at 30 pounds per acre at monthly intervals for 3 months, greatly reduced the number of tubers. TCA, applied at rates over 200 pounds per acre, was only partly effective in killing the tubers. Cibes et al.<sup>3</sup> reported that 3-D-Weedone, Super-D-Weedone, Tordon 101, and MCPA would control *Cyperus brevifolius*, *Cyperus ferax*, *Cyperus diffusus* and *Cyperus esculentus*. A report by Rodríguez and Filiberty<sup>4</sup> on the effectiveness of various preemergent herbicides, applied during the establishment of a centipede grass lawn, indicates that Monuron, Diuron, Simazine or Atrazine did not provide control of the purple nutsedge.

A mixture of alluvial soil from Gurabo and filter-press cake was used in the experiment herein reported. No fertilizer was used. Purple nutsedge tubers collected in the vicinity of Río Piedras and Guaynabo were planted.<sup>5</sup>

<sup>1</sup> Manuscript submitted to Editorial Board March 18, 1981.

<sup>2</sup> Loustalot, A. J., Muzik, T. J. and Cruzado, H. H., 1954. Studies on Nutgrass (*Cyperus rotundus* L.) and Its Control, Fed. Exp. Stn. P.R. USDA, Mayagüez, P.R. Bull. 52.

<sup>3</sup> Cibes-Viadé, H. R., González-Ibáñez, J. and Semidey, N., 1977. Pre- and postemergent herbicides for the establishment of a Centipede grass lawn, Annual Progress Report 1977.

<sup>4</sup> Rodríguez, S. J. and Filiberty, A. R., 1966. Effects of different levels of four herbicides used as preemergent treatment on the establishment of Centipede lawn grass (*Erimochloa ophiuroides*), J. Agric. Univ. P.R. 50 (3): 241-6.

<sup>5</sup> Matilde del Rosario Toledo, third year student at San José High School in Villa Caparra, sifted the soil and counted the coquí tubers.

A wettable powder formulation of DPX 4129 (90% ai) was used in a preemergence experiment. DPX 4129 plus surfactant X-77 was used for the post emergence experiment.

Soil was treated with herbicide DPX 4129 in the following concentrations: 0, 0.25, 0.5 and 1 kg/ha, followed by a 5-min mixing in a rotary type mixer to incorporate the herbicide. The treated soil was placed in trays which were fully randomized within each of three replications. Tubers (9 per tray) of purple nutsedge were planted January 9, 1980, at a 5 cm depth in trays (400 cm<sup>2</sup>, 20 cm depth) of soil. Trays were placed on a greenhouse bench and watered as required. The herbicide was applied with a single nozzle spray delivering 200 ml/400 cm<sup>2</sup>. After 4–8 weeks the number of seedlings of other plants present and nutsedge fresh weights (above soil level) was recorded.

TABLE 1.—Effect of three doses of herbicide DPX 4129 on number and fresh weight of sedges (*Cyperus rotundus* L.) under greenhouse conditions

Dose of herbicide DPX 4129	Pre- and postemergence application <sup>1</sup>			
	Preemergence application		Postemergence application	
	Plants no.	Weight g.	Plants no.	Weight g.
<i>kg ai/ha</i>				
0.00	13.33 a	19.33 a	25.67 a	20.00 a
1.00	4.00 b	4.33 b	8.00 b	3.33 b
0.50	7.67 b	8.67 a	6.00 b	10.00 b
0.25	5.33 b	3.33 b	3.33 b	6.00 b

<sup>1</sup> Values followed by the same letter do not differ significantly at the 5% probability level.

Also, purple nutsedge plants were raised for 14 days under greenhouse conditions similar to those already described. There was good sprouting of the tubers, up to 36 plantlets per tray. Broadleaf as well as grass weeds emerged together with the nutsedge plantlets, which by the time of treatment were in the three- to four-leaf stage. DPX 4129 with 1 ml/400 cm<sup>2</sup> X-77 surfactant was applied January 23, 1980, as a foliar spray at 0, 0.25, 0.5 and 1 kg/ha rates. Trays were placed on a greenhouse bench and observed for 4 consecutive weeks.

After 4 weeks, fresh weights (above the soil level) of broadleaves, grasses and nutsedge were taken.

The treatments in both experiments were arranged in a randomized block design with three replications. All data were statistically analyzed and treatment means were compared with Duncan's Multiple Range Test.

The number and weight of purple nutsedge were affected significantly by either pre- or postemergence applications of DPX 4129 (table 1). There was continuous growth of broadleaf and grass weeds regardless of

treatment. DPX 4129 did not significantly reduce the number or weight of other weeds (table 2).

The purple nutsedge was damaged more by DPX 4129 at all rates used when the herbicide was either mixed with the soil or applied as a foliar spray. The same amount of herbicide was much more active when sprayed than when mixed with the soil. At the end of 2 weeks of the postemergence applications the sedges were chlorotic. By the end of 4 weeks they were almost dry; only one sedge plant was still showing a very pale green coloration. The three amounts of herbicide, either mixed with the soil or sprayed, did not affect other weeds growing in the sedge trays.

TABLE 2.—Effect of herbicide DPX 4129 on the number and weight of broadleaf and grass weeds growing together with *Cyperus rotundus* L. under greenhouse conditions.

Dose of herbicide DPX 4129	Pre- and postemergence application <sup>1</sup>			
	Preemergence application		Postemergence application	
	Plants no.	Weight g.	Plants no.	Weight g.
<i>kg ai/ha</i>				
0.00	45.00 a	60.33 a	30.00 a	39.8 a
1.00	37.33 a	41.33 a	37.33 a	38.1 a
0.50	31.70 a	39.70 a	32.33 a	38.1 a
0.25	30.00 a	38.00 a	30.00 a	39.8 a

<sup>1</sup> Values followed by the same letter do not differ significantly at the 5% probability level.

These findings suggest that the degree of weed control is not likely to depend upon the placement of the herbicide at a certain moment.

Since nutsedge tubers develop and sprout close to the surface, it would be very easy for the DPX 4129 to reach tuber level. The plantlet could emerge from a 5 cm depth in the postemergence applications. Foliage intake may be of great importance in contrast with soil application.

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