

Research Note

EVALUATION OF HERCULES 22234 (ANTOR) AS A PREEMERGENCE HERBICIDE ON CABBAGE¹

Jackson and Sierra² evaluated nine new unregistered preemergence herbicides on 20 vegetable and grain crops during the spring of 1973. As a result of this primary screening, one of the new compounds, N-chloroacetyl-N-(2, 6-diethylphenyl)-glycine ethyl ester, demonstrated potential value as a herbicide for vegetable growing in the tropics. This compound is known as Hercules 22234 or Antor.³ In secondary trials, this chemical was evaluated on okra.⁴ The purpose of this paper is to present the effects of this material on cabbage (*Brassica oleracea* "capitata") and on the weed flora associated with that crop.

Jackson, et al.⁵ had previously evaluated selected registered pre-emergence herbicides for weed control in vegetables. As a result of this work, DCPA was recommended at 10.5 lb. AI/acre for cabbage.^{5, 6}

An experiment was established during March, 1975, at the Fortuna Substation in a field of San Antón silt loam, a Cumulic Haplustoll.⁷ This neutral, (pH 7.16) friable, brown soil, consists of: silt 39%, sand 39% and clay 22%, with 2.39% organic matter, and a base exchange capacity of 25.3 meq/100 g.

Cabbage, variety Stonehead, was seeded with a Stanhay Mk II precision seed drill, using the recommendations of Eavis.⁸ Spacing was 10 in between seed, with a row spacing of 3 ft, center to center.

¹ Manuscript submitted to Editorial Board March 10, 1977. Parts of this paper were presented at the annual meeting of the Sociedad Puertorriqueña de Ciencias Agrícolas, Fortuna Substation, Juana Díaz, P.R., October 22, 1976.

² Jackson, G. C., and Sierra, C., Primary evaluation of new unregistered preemergence vegetable herbicides, Proc. Caribb. Food Crops Soc. 11: 428-34, 1973.

³ Trade names are used 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.

⁴ Jackson, G. C., and Sierra, C., Performance of Gulf S-6797 and Hercules 22234 as preemergence herbicides on okra, J. Agric. Univ. P.R., 60(3): 434-5, 1976.

⁵ Jackson, G. C., Almodóvar, L. A., Sierra, C., and Mangual, G., Vegetable herbicide field work in Puerto Rico, 1970-72 (Summary), Proc. Caribb. Food Crops Soc. 10: 115, 1972.

⁶ Cibes, H. R., Almodóvar, L. A., Jackson, G. C., Vélez, A., and Boneta, E., Control químico de las malas yerbas en los cultivos económicos de Puerto Rico. Est. Expt. Agr., Univ. P.R., Publ. 86, 1974.

⁷ Lugo-López, M. A., and Rivera, L. H., Taxonomic classification of the soils of Puerto Rico, Agric. Exp. Stn., Univ. P.R., Bul. 245, 1976.

⁸ Eavis, B. W., Direct seeding of vegetable crops under tropical conditions in Barbados. Proc. Caribb. Food Crops Soc. 10: 27-37, 1972.

The experimental design was partially-balanced incomplete blocks, with 3 treatments and 12 replications. The herbicides were tested for preemergence activity at manufacturer's recommended rates, consisting of: DCPA at 10.5 lb AI/acre, Hercules 22234 at 3.0 lb AI/acre, and no-treatment control. Herbicides were applied immediately after direct seeding, using a PTO-driven Chem-Farm sprayer transported by a Ford 3000 tractor. Overhead irrigation was applied immediately after herbicide applications were completed. Subsequent irrigations were applied as required. To avoid disturbing herbicidal activity of the treatments, the crop was not cultivated. Other cultural requirements, such as disease and pest control practices were conducted.⁹

Crop stand was evaluated at 14 days, percent weed control at 48 days, and the crop harvested in one pick at 90 days. Individual marketable head weights and cull weights/acre were recorded.

Plant populations at 14 days for DCPA, Hercules 22234, and control groups were 93, 90, and 90%, respectively. This indicated that there

TABLE 1. — Weed control in and crop yields of Stonehead cabbage at the Fortuna Substation

Treatment	Pounds AI/acre	Weed Control		Marketable head weight	Yield	Culls
		Broadleaf	Grasses			
		%		Lb	Tons/acre	Tons/acre
DCPA	10.5	95	95	1.3	9.0 a ¹	1.4
Hercules 22234	3.0	85	95	1.1	4.9 b	2.6
Control	0	0	0	.5	1.3 c	4.3

¹ Yields followed by a letter in common do not differ significantly at the 1% level.

was no phytotoxic effect on germination and early-juvenile growth processes.

The percent weed control at 48 days after treatment is presented in table 1. The broadleaf weed population was composed of horse purslane (*Trianthema portulacastrum*), common purslane (*Portulaca oleracea*), caltrop (*Kalstroëmia maxima*) and pigweed (*Amaranthus dubius*). The grass weed population was composed of junglerice (*Echinochloa colonum*), goosegrass (*Eleusine indica*) and rice grass (*Sorghum verticilliflorum*). There also was an uneven distribution of purple nutsedge (*Cyperus rotundus*). The two herbicides had equal effect in the control of grasses and broadleaf weeds, with DCPA showing a slight superiority over Hercules 22234. Neither chemical controlled purple nutsedge.

DCPA treatments were significantly higher than Hercules 22234 ($P = .01$) and the control in yield of marketable tons/acre of cabbage. Individual marketable head weights of DCPA treatments were also

⁹ Estacion Experimental Agrícola, Universidad de Puerto Rico, Conjunto tecnológico para la producción de hortalizas, Pub. 102, 1976.

higher. Neither herbicide demonstrated phytotoxicity in germination or seedling growth; however, head development in the Hercules 22234 treatments was poor, resulting in low marketable yield. Poor yield of the control plots may be attributed to weed competition and poor insect control (table 1).

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