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EFFECT OF SOME PHENOXY HERBICIDES ON VIGNA
MARINA AND GLYCINE JAVANICA

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SUMMARY

2,4-D amine had more severe effects on both species than 2,4-D ethyl ester, 2,4-DB and MCPB.

This note reports the effect of some phenoxy herbicides on *Vigna marina* cv. Dalrymple vigna, and gives additional information to that recorded by Draper (1964) on the effect of 2,4-DB on *Glycine javanica* cv. Tinaroo glycine.

The herbicides tested were "Shirweed 50" (50% w/v 2,4-dichlorophenoxyacetic acid as the dimethylamine salt), "Estone 80" (80% w/v 2,4-dichlorophenoxyacetic acid as the ethyl ester), "Bexone" (40% w/v 4-(2,4-dichlorophenoxy) butyric acid as the potassium salt), and "Tropotox" (40% w/v 4-(4-chloro-2-methylphenoxy) butyric acid as the sodium salt.

Six germinated legume seeds inoculated with the appropriate Rhizobium strain were planted in 8½-in. diam. pots containing a sandy clay loam of basaltic origin on February 23, 1965, and thinned to four plants per pot before spraying on March 29, 1965. Sprays (½ lb a.e. per acre) were applied at 40 gal/ac and 35 lb/sq in under shelter. Meteorological conditions at spraying were dry-bulb reading 90°F and relative humidity 54%. *Glycine javanica* had 5 or 6 trifoliolate leaves and *Vigna marina* had 10-15 at spraying time.

Each treatment was replicated four times and arranged in fully randomized blocks in a glasshouse. Top-growth was cut to ground level 39 days after spraying, dried at 95°C, and then weighed.

Results

The results are summarized in Table 1.

Vigna marina.—Within a week of spraying, 2,4-D amine had caused severe leaf drop, 2,4-D ethyl ester moderate leaf drop, and 2,4-DB and MCPB slight leaf drop.

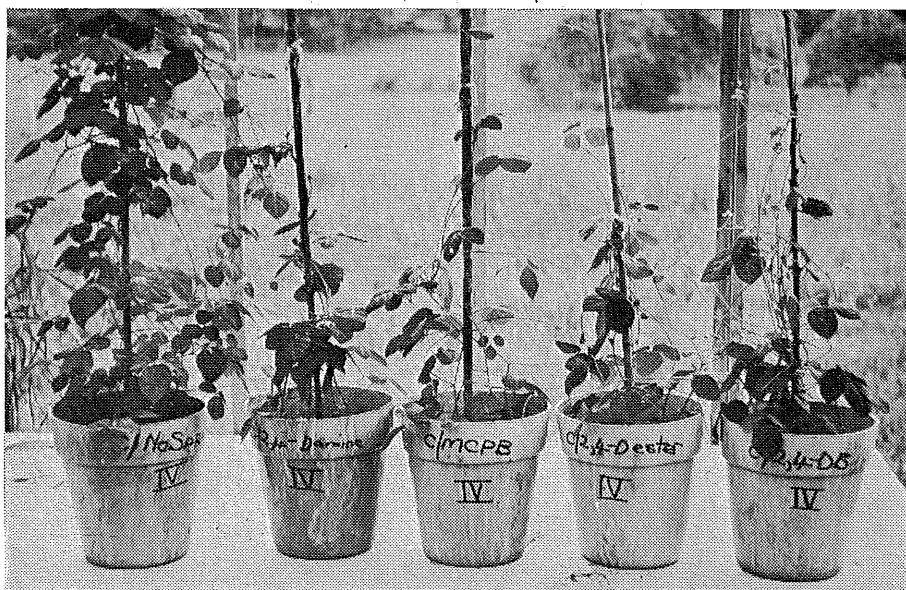


Fig. 1.—*Glycine javanica* 39 days after spraying. Left to right: untreated, 2,4-D amine, MCPB, 2,4-D ethyl ester, and 2,4-DB.

TABLE 1

TOP GROWTH YIELD AND TRIFOLIATE LEAF COUNTS

Treatment	D.M. Yield/Pot (g)		Trifoliolate Leaf Numbers			
			Total No./Pot		Percentage Reduction Compared With Untreated	
	<i>Glycine javanica</i>	<i>Vigna marina</i>	<i>Glycine javanica</i>	<i>Vigna marina</i>	<i>Glycine javanica</i>	<i>Vigna marina</i>
Untreated	14.10	15.70	142	195
2,4-D amine	4.50	4.82	14	55	90.09	68.73
2,4-D ethyl ester	6.50	12.87	32	144	77.55	26.52
2,4-DB	7.35	10.97	67	158	52.74	18.40
MCPB	6.87	13.75	37	177	73.95	8.64
Necessary differences for significance { 5% 1%	2.78 3.75		Not analysed		10.44 14.99	32.92 47.30

Spray/species interaction significant at 1% level for D.M. yield/pot

At harvest time, surviving plants in the 2,4-D amine treatment (5 out of 16) were severely checked through the initial leaf drop and the death of growing tips. Callus tissue formation occurred with the two 2,4-D treatments only, and this was at the stem bases. No interference with axillary growth through callus tissue formation was noted.



Fig. 2.—*Vigna marina* 39 days after spraying. Left to right: untreated, 2,4-D amine, MCPB, 2,4-D ethyl ester, and 2,4-DB.

Although distortion and size reduction of new trifoliolate leaves was not particularly marked, it was present to varying degrees with all spray treatments.

Glycine javanica.—2,4-D amine and 2,4-D ethyl ester caused *Glycine javanica* to wilt within a week of spraying, while the phenoxybutyric compounds produced only slight distortion of the growing tips. Trifoliolate leaves present at the time of spraying with 2,4-D compounds were darker green on sprayed plants at harvest time but were not distorted. New trifoliolate leaves were, however, generally reduced in size, distorted and paler in colour. Both forms of 2,4-D caused dieback from the growing tip and death of some of the original top trifoliolate leaves. Spray treatments induced callus tissue formation at the stem bases and in the stem and petiole axils. This was particularly marked with 2,4-D amine, where the callus tissue appeared to interfere with new axillary growth and frequently new growth died subsequent to initiation. 2,4-DB appeared to interfere least with new vegetative growth.

REFERENCE

- DRAPER, W. J. (1964).—Response of *Glycine javanica* to the application of a substituted phenoxybutyric acid herbicide. *Qd J. Agric. Sci.* 21:239-42.

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