

## QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES

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**CONTROL OF THE DUBOISIA LEAF BEETLE  
*PSYLLIODES PARILIS* WEISE**

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**SUMMARY**

*Duboisia leichhardtii*, grown in southern Queensland for production of alkaloid drugs, is attacked by the duboisia leaf beetle, *Psylliodes parilis* Weise. Various insecticidal treatments were tested during 1975 at Murgon, Queensland, to control this pest. Trunk and foliar sprays, applied at the quoted rates of active constituent, of carbaryl (0.1%), promecarb (0.1%), tetrachlorvinphos (0.1%), endosulphan (0.075%) and methamidophos (0.05%) gave an initial high level of control of the pest. Diazinon (0.05%) and dimethoate (0.03%) sprays were less efficacious while soil and butt applications of dieldrin and soil incorporation of fensulphothion, diazinon and chlordecone did not provide control. None of the chemicals provided residual protection.

**I. INTRODUCTION**

*Duboisia leichhardtii*, a native of the eastern parts of Australia, is grown mainly in the South Burnett region of Queensland for the production of alkaloid drugs. Smith (1974) in a discussion of the pests of duboisia, outlined the biology of *Psylliodes parilis* Weise, the duboisia leaf beetle, which causes defoliation and reduces yield of harvested leaf.

This study was aimed at finding alternatives to DDT which was recommended previously for control (Smith 1974).

**II. MATERIALS AND METHODS**

The experiment was located in the Murgon district in a recently harvested plantation. A small amount of foliage remained on the 1-metre-high stumps of the trees. The soil was a red Krasnozem. The experiment was laid out as a 12 x 4 randomised block using a plot size of one tree. A pretreatment count of the number of beetles present per tree and the chemical applications were made on 20 February 1975.

Three chemical control strategies were investigated. One comprised trunk and foliar sprays applied at an average of 0.3 l of spray per tree. In the second, an average of 0.62 l of spray was applied to the tree butts and to soil for a 200-mm radius from the base of each. The third involved incorporating materials in the soil to a depth of 30 mm, over a radius of 200 mm from the base of the tree. The rates of application are given in table 1.

Further population counts were made 1 and 8 days after treatment. Observations indicated that the beetles move freely between the soil and the foliage, with few emerging to feed on overcast and windy days. Therefore all population assessments were made on fine, hot days with light winds.

**TABLE 1**  
EFFECT OF TREATMENTS AGAINST *P. parilis* POPULATIONS ON DUBOISIA—MEAN NUMBERS OF BEETLES PER TREE

Treatment		Pretreatment		1 Day Post-treatment	
Chemical	Rate (a.c.)	Transformed Mean (4)	Equivalent Mean	Transformed Mean (4)	Equivalent Mean
carbaryl (1)	0.1%	5.29	27.52	0.84a	0.20
promecarb (1)	0.1%	8.17	66.19	0.84a	0.20
tetrachlorvinphos (1)	0.1%	6.99	48.40	0.84a	0.20
endosulphan (1)	0.075%	7.09	49.80	1.54ab	1.88
methamidophos (1)	0.05%	7.26	52.19	1.83ab	2.85
diazinon (1)	0.05%	8.42	70.47	2.82bc	7.47
dimethoate (1)	0.03%	8.02	63.84	4.26cd	17.61
dieldrin (2)	0.1%	7.26	52.14	4.99de	24.44
fensulphothion (3)	2.5g	7.67	58.39	6.33ef	39.61
diazinon (3)	2.5g	7.30	52.85	7.10f	49.99
chlordecone (3)	2.5g	8.36	69.44	7.64f	57.88
control		7.75	59.57	7.55f	56.33
		F = 1.75		F = 16.43**	
				LSD (5%) =	
				1.94	

Transformed means followed by the same letter are not significantly different at the 5% level.

(1) foliar and trunk sprays (2) butt and soil sprays (3) soil incorporation (4)  $\sqrt{x + \frac{1}{2}}$  transformation.

### III. RESULTS AND DISCUSSION

The analyses of the results of pretreatment and 1-day post-treatment counts are summarised in table 1. Applications of carbaryl, promecarb and tetrachlorvinphos used at 0.1% active constituent, endosulphan at 0.075% and methamidophos at 0.05% gave a high level of control of the beetle at 1-day post-treatment. Movement from adjacent harvested areas caused a population increase before the 8-day post-treatment count. Significant differences were not demonstrated by analysis of these data and results are not quoted. Thus under the population pressures experienced foliar sprays did not give 8-days residual efficacy.

Neither the butt and soil treatments nor the soil incorporations were effective. One day may have been too short a period for the chemicals to contact and affect the beetles while the pressures at the 8-day post-treatment count, again, may have obscured an effect. These techniques warrant further investigation.

### IV. ACKNOWLEDGEMENT

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### REFERENCE

SMITH, D. (1974).—Insects and other pests of duboisia. *Queensland Agricultural Journal* 100:243-51.

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