TECHNICAL NOTES

TOBACCO LEAF-MINER SCREENING TRIALS, 1961–1962

The tobacco leaf-miner, *Phthorimaea operculella* (Zell.), is the most serious pest of tobacco in Queensland. Before DDT was introduced (Smith 1952), lead arsenate dusts were used to control leaf-miner (Atherton 1936). Smith (1961), reporting work carried out from 1949 to 1955, showed that DDT, endrin and dieldrin applied as protective sprays were effective in controlling the pest.

From about 1957 leaf-miner began to cause increasingly serious damage to tobacco in Queensland, and it seemed that applications of DDT, endrin and dieldrin were not achieving adequate control. Saunders and Ettershank (1961) reported three screening trials in which "Telodrin" was shown to produce quick kills of leaf-miner larvae, and this insecticide was recommended for use in the field as a spot treatment for leaf-miner control (Smith and Saunders 1960).

The introduction of Telodrin has improved the control of leaf-miner but the insect has continued to cause serious damage to tobacco in some districts. In the 1961-62 and 1962-63 seasons, eight screening trials were completed at the Millaroo Research Station of the Queensland Department of Primary Industries on the Burdekin River in North Queensland, in an endeavour to find a more effective material. The trials were carried out under hot, dry conditions on furrow-irrigated tobacco. Trials 1, 2 and 3 were completed from late October to mid December, 1961, and Trials 4 to 8 inclusive from early October to mid November, 1962. In all trials a plot size of six plants was used in a randomized block layout of 6 x 4 for Trials 1 to 7 inclusive and 12 x 4 for Trial 8. The insecticide treatments used in each trial are shown in Figures 1 and 2. All insecticides were applied as sprays, using a knapsack sprayer, thoroughly wetting both sides of each leaf, and the following formulations were used:

Azinphos-ethyl.—An emulsifiable concentrate containing 40 per cent. w/v active constituent.

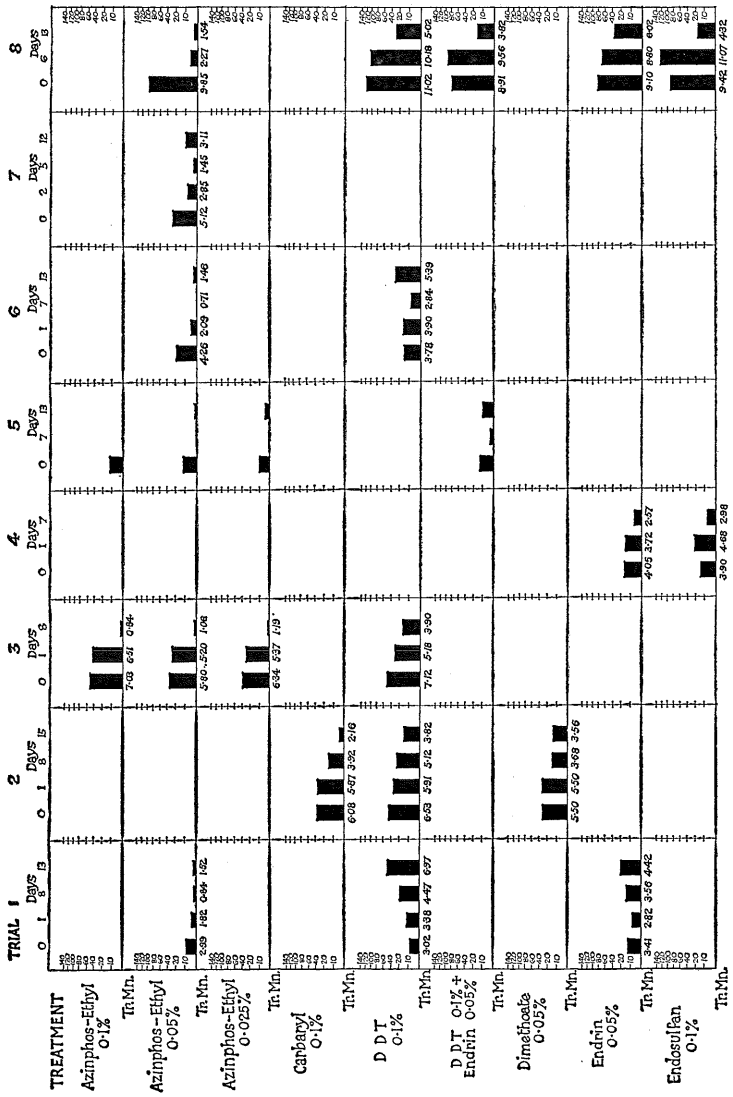
Carbaryl.—A wettable powder containing 50 per cent. w/w 1-napthyl N-methylcarbamate.

DDT.—An emulsion concentrate containing 25 per cent. w/v *p.p'* isomer.

Dimethoate.—A concentrate containing 30 per cent. w/v active constituent.

Endosulfan.—An emulsifiable concentrate containing 20 per cent. w/v active constituent.

Endrin.—An emulsifiable concentrate containing 20 per cent. w/v active constituent.



(Upper portion of Fig. 1)

Fenthion.—An emulsifiable concentrate containing 55 per cent. w/v active constituent.

Malathion.—An emulsifiable concentrate containing 50 per cent. w/v active constituent.

"Mesurol".—A wettable powder containing 50 per cent. w/w 3,5-dimethyl-4-methylmercaptophenyl-N-methylcarbamate.

Mevinphos.—A concentrate described as containing not less than 60 per cent. of the alpha isomer of 2-carbomethoxy 1-methylvinyl dimethyl phosphate and not more than 40 per cent. of active related compounds.

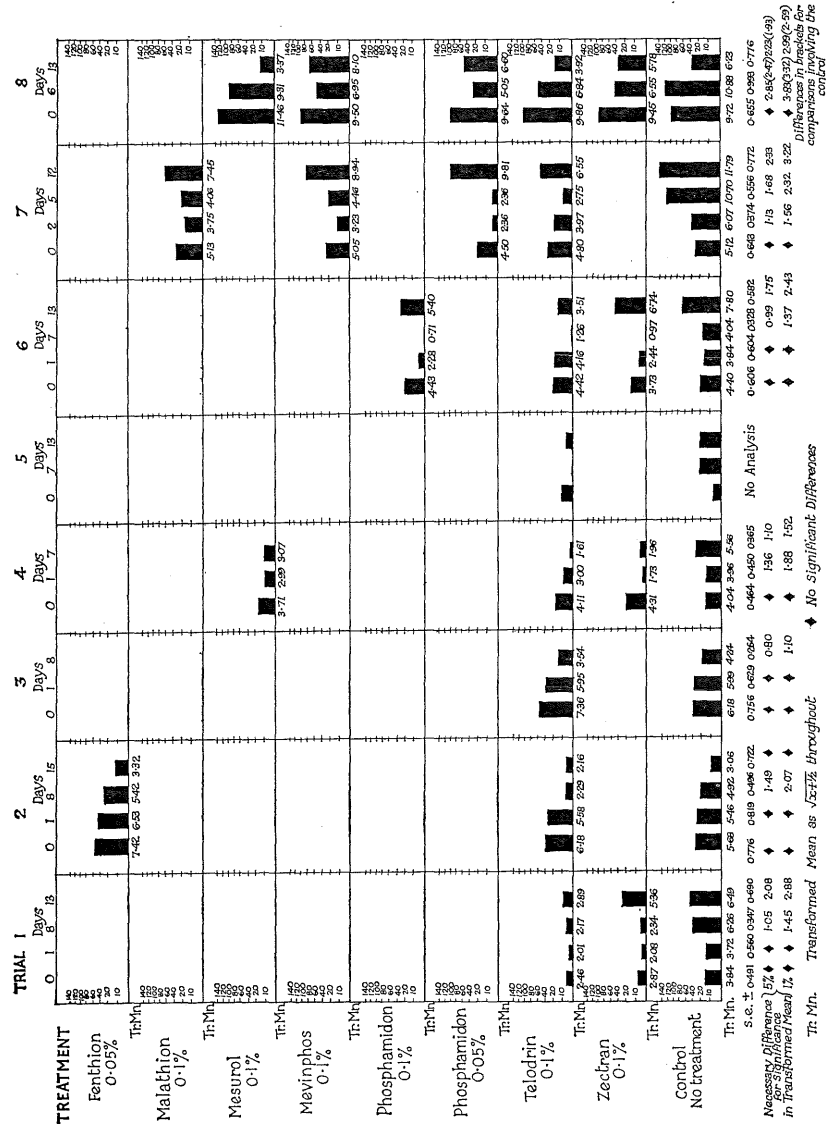


Fig. 1.—Larval counts for treatments in eight trials. (Mean number of larvae per 6-leaf plot sample, before treatment (0) and after treatment (days)).

Phosphamidon.—A concentrate containing 50 per cent. active constituent.

"Telodrin".—An emulsifiable concentrate containing 15 per cent. w/v 1,3,4,5,6,7,8, 8-octochloro–1,3,3a,4,7,7a-hexahydro–4, 7-methanoisobenzofuran.

"Zectran".—An emulsifiable concentrate containing 22·3 per cent. w/v 4-dimethylamino-3, 5-xylyl N-methylcarbamate.

Counts were made of living larvae of all instars in one leaf removed from each of the six plants in each plot. If the leaves are numbered from the bottom up, leaf No. 1 was taken from the first plant and No. 2 from the second and so on up to six for each plot for the first count. For the second count, leaf No. 2 was taken from the first plant, No. 3 from the second and so on and No. 1 from the sixth. This process gave a sampling of the lower six leaves, where nearly all of the leaf-miner infestation was located, in each plot and could be continued for up to six counts. The mean plot total is therefore equivalent to the mean number of leaf-miners in the lower six leaves per plant.

A pretreatment sample was taken on the day of spray application, and post-treatment samples at the intervals shown in Figures 1 and 2. Results are summarized in Figure 1.

Azinphos-ethyl was outstanding in controlling leaf-miner, both for quick kill and for residual action up to 14 days. Telodrin was confirmed as being efficacious in controlling leaf-miner, but was inferior to azinphos-ethyl, especially under conditions of high populations (Trials 7 and 8). Phosphamidon and Zectran showed promise for leaf-miner control as far as quick kills were concerned but failed markedly to show a suppression of populations at 12–14 days. Previously recommended insecticides, DDT and endrin, provided some control of moderate populations of leaf-miner, but were inferior to azinphos-ethyl, especially at high population levels. Other insecticides tested did not give adequate control of leaf-miner.

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J. J. DAVIS,
Queensland Department of Primary Industries.

(Received for publication July 8, 1963)