QUEENSLAND DEPARTMENT OF PRIMARY INDUSTRIES
DIVISION OF PLANT INDUSTRY BULLETIN No. 298

SCALICIDES FOR USE ON PAPAWS IN QUEENSLAND

A number of different scale insects occur on papaws in Queensland (Brimblecombe 1961). Although commercial growers in this State are not as yet troubled by any of them, some are potentially serious pests. The oriental scale (*Aonidiella orientalis* (Newst.)) is troublesome in the tropics north of Australia and has reached pest proportions in Darwin. It is now known to occur at Mt. Isa and Thursday Island and could be a major pest should it enter the commercial papaw-growing areas further south.

In Hawaii, where papaws are extensively grown, the phytotoxicity of a number of pesticides has been tested on the variety Hawaiian Solo (Sherman and Tamashiro 1959). This work showed that most organophosphate insecticides were highly toxic but malathion was harmless. The emulsifiable concentrate formulations of the materials used were usually more phytotoxic than the corresponding dispersible powders.

No investigations with suitable scalicides for this crop have previously been made in Queensland. It appeared desirable therefore to test the reaction of papaws to scalicides under local conditions and for this purpose trials were carried out at the Maroochy Horticultural Research Station, near Nambour, in south-eastern Queensland, in the period October to December 1961.

Materials and Methods

Separate trials were conducted with the two varieties Hawaiian Solo and Hybrid 5. The plants used in these trials were planted out in March 1960 and harvesting of the first crop had commenced. Single-tree plots were arranged in 9 x 8 randomized blocks with single guard rows between trial rows.

The insecticides used, with concentrate and spray strengths, were as follows:

Dimethoate.—A concentrate containing 30 per cent. w/v active constituent, used at 0·1 and 0·15 per cent.

Malathion.—An emulsifiable concentrate containing 25 per cent. w/v active constituent, used at 0·1 and 0·15 per cent.

Malathion.—A dispersible powder, containing 50 per cent. w/w active constituent, used at 0·1 and 0·15 per cent.

White oil.—An emulsion concentrate containing 84 per cent. w/v petroleum oil, used at a dilution of 1 in 80 and 1 in 60.

Spray applications were made four times at intervals of three weeks commencing on October 12. Leaves and fruit were sprayed until run-off began, each plant receiving on an average slightly more than one pint of spray at each application. Actual treatments were as follows: (1) malathion (E.C.) 0·15

per cent.; (2) malathion (E.C.) 0·1 per cent.; (3) malathion (D.P.) 0·15 per cent.; (4) malathion (D.P.) 0·1 per cent.; (5) dimethoate 0·15 per cent.; (6) dimethoate 0·1 per cent.; (7) white oil 1 in 60; (8) white oil 1 in 80; and (9) untreated.

In additional unreplicated observational trials, Treatments, 1, 3, 5, 7, 8, and 9 were applied to the varieties Bettina 100 A, Hortus Gold, Guinea Gold, and JW X IG, and Treatments 1, 7, and 9 were applied to the variety Brookfield 2.

Results and Discussion

Papaw foliage and fruit commonly show blemishes or injuries caused by various climatic, mechanical, disease or other agencies. For this reason, pretreatment examination of both foliage and fruit of the experimental plants was made so that the specific result, if any, of spray injury could be clearly determined and defined. Similar post-treatment examinations were made one week after each spray application, particular attention being given to fruit and young leaves developing during the trials.

No fruit or foliage injury which could be attributed to the treatments was observed in any of the trials. Blemishes due to other causes, noted before and after applications, did not increase between applications.

The dispersible powder formulation of malathion left a persistent white powdery residue on fruit and foliage. The white oil application produced a slightly oily appearance noticeable on some trees for a week or more after spraying but was not an injury and would not affect marketability of fruit.

Obvious differences were shown in the ability of the materials to wet the plants, dimethoate (emulsifiable), malathion (emulsifiable) and malathion (dispersible) showing, in that order, decreasing wetting ability. The spreading of the white oil after application gave good oil coverage.

These trials demonstrated that all the materials tested can be applied to Hawaiian Solo and Hybrid 5 varieties of papaw at strengths up to 0·15 per cent. active constituent without risk of injury to fruit or foliage. Further observations showed that these materials are not likely to injure Bettina 100 A, Hortus Gold, Guinea Gold and JW X IG, while malathion (emulsifiable) and white oil are unlikely to injure Brookfield 2.

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(Received for publication May 29, 1964)

S. G. REID, Government Printer, Brisbane