

PHOSTOXIN™ FOR CONTROL OF *ERIOPHYES*
MANGIFERAE (ACARINA: ERIOPHYIDAE) ASSOCIATED
WITH MALFORMATION DISEASE IN MANGO

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ABSTRACT

Aluminum phosphide (Phostoxin™) was tested against *Eriophyes mangiferae* Sayed which is associated with the malformation disease of mango. The disease is common in mango orchards all over the world. Complete control of the mites resulted when malformed shoots and mango saplings containing *E. mangiferae* were exposed to 2 pellets of aluminum phosphide (1.8 mg phosphine/litre) for 72 hr inside an iron bin. Predatory mites including *Cheletogenes ornatus* (Canestrini and Fanzago), however, also were killed.

Mango malformation is common in most mango orchards of the world. The disease affects adversely both the vegetative and floral parts. In case of severe malformation the fruit setting is extremely poor. Mango is grown in about 70% of the total area under fruit crops in India. The tremendous loss incurred by the mango industry due to this disease can not be over-emphasized. Hydrogen phosphide has been recommended for the control of numerous pests of storage by various workers (Lindgren et al. 1958, and Sinha et al. 1967). Present investigations were undertaken to find the efficacy of this fumigant against *Eriophyes mangiferae* Sayed which is associated with the mango malformation disease (Narasimhan 1954, Puttarudriah and Channa Basavanna 1961, Nariani and Seth 1962, Yadava 1969).

MATERIALS AND METHODS

Six 3-year old mango saplings growing in moist soil in the Division of Entomology, Indian Agricultural Research Institute, New Delhi, were treated. Five malformed shoots containing the mites were taken from a mango tree and stuck into the soil close to each sapling. An aluminum phosphide pellet (0.6 g) enclosed in muslin cloth was tied to the sapling. A maximum-minimum thermometer was then placed at the base of the plant. A galvanized iron sheet bin (56 cm diam, 90 cm height, and 2211 capacity) was inverted over the sapling and the bin's edges were carefully sealed by mud. Saplings and shoots were exposed to 2 different doses of aluminum phosphide for 24, 48, and 72 hr. For each period of exposure, 3 replications were made. These tests were conducted during October 1969 to January 1970.

RESULTS AND DISCUSSION

The mortality figures presented in Table 1 are the averages of the 3 replications for each exposure period under the 2 treatment conditions. Exposure to 1 pellet of aluminum phosphide even up to 96 hr gave only about 91%

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TABLE 1. CONTROL OF *Eriophyes mangiferae* ADULTS AND NYMPHS FUMIGATED WITH HYDROGEN PHOSPHATE. AVERAGE MIN. TEMP. 47° F, AVERAGE MAX. TEMP. 74° F.

| Percent mortality (Aver. of 3 replications) | | | | | |
|---|-------------------|---|---|------------------|---------------------|
| Dosage | Hours of exposure | In open axillary buds (with loose scales) | In closed axillary buds (with compact scales) | In terminal buds | Average % mortality |
| 0.9mg/1 (1 pellet) | 24 | 86.7 | 77.3 | 73.5 | 79.1 |
| | 48 | 88.4 | 85.8 | 88.9 | 87.7 |
| | 72 | 89.8 | 87.4 | 95.6 | 90.9 |
| 1.8mg/1 (2 pellets) | 24 | 91.8 | 91.5 | 94.9 | 92.7 |
| | 48 | 99.8 | 99.9 | 98.8 | 99.5 |
| | 72 | 100.0 | 100.0 | 100.0 | 100.0 |

mortality of mites. When the dosage was increased to 2 pellets, 100% control was achieved after 72 hr exposure. At low dosage the mortality in compact buds was less than in open buds. But the compactness of buds had no effect on the mortality of the mites when the dosage was doubled. Unlike hydrogen cyanide (Pradhan et al. 1962), phosphine did not produce any phytotoxic effect on the mango saplings.

Total control of *E. mangifera* was achieved when mango saplings and malformed shoots were exposed to 2 phostoxin pellets for 72 hrs. The predatory mite *Cheletogenes ornatus* (Canestrini and Fanzago), however, also was killed by this treatment. Since *E. mangiferae* has been reported as one of the causative agents for the malformation disease by several workers, the results of this study have obvious economic implications. Phostoxin fumigation shows much promise in control.

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