CHEMICAL CONTROL OF STEM BLEEDING DISEASE OF COCONUT

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Stem bleeding disease of coconut caused by *Thielaviopsis paradoxa* is widely prevalent in coconut growing states in India. The pathogen has been reported to be very sensitive to two systemic fungicides, namely, carbendazim (Bavistin) and tridemorph (Calixin) under *in vitro* conditions (Anonymous, 1988). The objectives of the present studies were to study: (i) suitable systemic fungicides for the control of the disease, (ii) the translocation and persistence of these chemicals in coconut, and (iii) the effect of these fungicides on potential antagonists of stem bleeding pathogen.

Field control trials involving Bavistin and Calixin applied through different methods were taken up in stem bleeding affected gardens to evolve an effective control schedule for this disease. The methods of application consisted of root feeding, stem injection, band application and soil drenching. Bavistin and Calixin were applied to the diseased palms thrice a year (January, June and October) through root feeding and stem injection (100 ml of 2 per cent or 5 per cent solution/palm in each case), band application (20 ml of 10 per cent solution/palm applied after chipping bark tissues) and soil drenching (40 l of 0.1 per cent solution/basin). The observations on lesion size, stem tapering and yield recorded before (1989) and after (1991) the experiment were used in calculating the disease index (Mathew *et al.*, 1989). It was observed that treatments with 100 ml of 5 per cent Bavistin/palm through root feeding and 100 ml of 5 per cent Calixin/palm through stem injection were better in reducing the rate of spread of the lesion on the stem. The mean disease indices at the end of the experiment were 7.38 and 7.00 in plots treated with Bavistin and Calixin, respectively compared to 14.94 in control plots. Yields of the palms treated with Bavistin 5 per cent (root feeding) and Calixin 5 per cent (stem injection) increased from 26 nuts/palm/year to 55 and 18 to 50, respectively.

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The study on translocation and persistence of the two test fungicides in coconut stem was undertaken using 30 year-old palms. The fungicides were applied through root feeding. Bavistin at the rate of 0.5 g/palm and 10 g/palm dissolved in 100 ml of 0.5 N HCl and Calixin at the rate of 2 ml/palm, 5 ml/palm and 10 ml/palm in 100 ml water were used for the study. Stem tissue samples were collected from 1, 2 and 3 m heights of the treated palms at regular intervals and assayed for residues using bioassay method (Anonymous, 1988; 1991). Nut water samples from four-, six- and 10-month-old nuts from the palms were also assayed similarly. The residues of carbendazim were detected only on the feeding side of the trunk up to 2 m height for a period of 180 days when Bavistin was applied at the rate of 10 g/palm. Tridemorph residues were detected from both feeding and opposite sides up to 3 m height for a period of 45 days in the palms treated with Calixin at all three concentrations (2, 5 and 10 ml/palm). Thus it is evident that tridemorph is comparatively more mobile in coconut stem than carbendazim. No detectable levels of residues of these two fungicides were found in the nut water samples of the treated palms.

The effect of carbendazim and tridemorph at different concentrations on the growth of *Trichoderma viride* and *T. harzianum* on PDA was studied using poisoned food technique. Carbendazim was found to be fungicidal to *T. harzianum* and fungistatic to *T. viride* at 1000 ppm whereas tridemorph was fungistatic to both these fungi even at 5000 ppm. Hence it is safe to use tridemorph for soil drenching at 1000 ppm.

Taking all the above factors into consideration, tridemorph (Calixin) is a better fungicide for use in the integrated disease management of stem bleeding disease of coconut.

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