Thermal fogging a new method for controlling powdery mildew disease of rubber in India

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ABSTRACT

A portable fog generator Pulsfog K.3 was field tested for fogging tridemorph against powdery mildew disease of rubber. Further investigations on improving the feasibility of its use are suggested.

INTRODUCTION

SULFHUR dusting, using a power duster is the conventional and widely practiced control operation against powdery mildew disease of rubber caused by *Oidium heveae* Steinm. in India. Low volume ground spraying of systemic fungicides in oil was later recommended as an alternative to sulphur dusting (Lim. 1976). Thermal fog generators have recently gained the attention of Plant Pathologists as an aid in plant protection operations. Of the several fog generators tried for this purpose, Leco 120 B, Tart and Tiga were found useful. (Lim. 1982). The former two are trailer mounted and the latter one is wheel drawn. However, the high cost of these machines and the difficulty in operating them on undulating terrains have deterred its use in rubber holdings in India. This investigation is initiated as a preliminary trial for testing portable and cheaper fog generators with a systemic fungicide for use in rubber plantations.

MATERIAL AND METHODS

A portable fog generator Puls fog K.3 was tested in the field for fogging tridemorph (Calixin) for the control of powdery mildew of rubber. Tridemorph 3% was incorporated in agricultural spray oil and used for fogging. The experiment was carried out in two locations planted with clones PB 86 and RRIM 600. The former has slight tolerance to the disease and the latter is susceptible. The fog generator was carried in every fifth row. Five litres of fungicide-oil mixture was used per hectare. Four rounds of fogging at 10-15 day intervals were carried out. Control plots received sulphur dust @ 12 kg/ha simultaneously. The dusting was done with a power duster. The duster was carried in every fourth row. Both fogging and dusting were carried out from 7 AM to 8 AM. During the dusting and fogging operations the air was still.

In each location, the two treatments were applied in a plot of 2 hectare each. From each plot, sampling was done from ten randomly selected trees which were marked prior to the disease season, by scoring the intensity of disease on the terminal five leaves of a terminal whorl of a lower branch. Ten samples containing fifty leaves were collected from each plot. Scoring of the disease intensity was done from 0-4 viz. 0—no infection, 1—upto 25% of the leaf area infected, 2—50% leaf area infected, 3—75% leaf area infected and 4—100% leaf area infected or leaf fall. The mean score per plot was calculated and expressed as percentage disease incidence using the formula:

$$\frac{\text{Sum of all the disease ratings} \times 100}{\text{Total number of ratings} \times \text{maximum disease grade}}$$

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RESULTS AND DISCUSSION

The percentage disease incidence in the experimental plots are given in Table 1.

TABLE 1

Percentage disease incidence in fogged and dusted plots

Location A:	
(Clone RRIM 600)	
Sulphur dusted	27.0
Calixin fogged	14.5
Location B:	
(Clone PB 86)	
Sulphur dusted	31.5
Calixin fogged	30.0

In one location (clone RRIM 600), thermal fogging of tridemorph was found to be superior to sulphur dusting. In the other location (clone PB 86) no marked difference between the treatment and control was noticed. This could be explained that better control was not obtained in the tolerant clone. Effectiveness of fogging tridemorph for controlling powdery mildew of rubber as compared to sulphur dusting was reported from Malaysia also, though the concentration of fungicide used was higher (4.7%) (Anon, 1978).

The machine tried could discharge 10 litres of spray fluid in 15 minutes. One machine can therefore cover about 30 hectares in a normal working day whereas only

about 15 hectares can be covered by a power duster. At the present rates, fogging tridemorph involves an additional cost of Rs. 15/- per round per hectare.

Although the cost of application per hectare was higher than that of sulphur dusting, further work on reducing the number of applications with more accurate timing, increasing the inter rows and variation in the dosage of the fungicide would help in arriving at an economically feasible schedule for thermal fogging against powdery mildew disease of rubber.

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