Indian Journal of Natural Rubber Research, 5 (1&2) : 1-6, 1992

REVIEW ARTICLE

PESTICIDE APPLICATION EQUIPMENTS USED IN RUBBER

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Matthews, G. A. (1992) Pesticide application equipments used in rubber. *Indian Journal of Natural Rubber Research* , 5 (1&2) : 1-6.

Techniques for applying pesticides to rubber trees are reviewed. Projection of fungicide into the canopy of tall trees has required the use of thermal fogs applying aerosol particles generally smaller than 50 µm in diameter. But applications need to be repeated to achieve adequate control. Maintenance of pathways by application of herbicides can be improved with knapsack sprayers by fitting a spray management valve to provide a constant 1 bar pressure at the nozzle. There has also been limited use of hand-held spinning disc sprayers to apply 250 µm droplets of herbicides.

Key words: *Hevea*, Fogging , Spraying, Fungicide, Herbicide.

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In several areas of rubber cultivation, fungicides and herbicides are applied for disease and weed control respectively. This paper reviews the present status of application equipment used in plantations.

Foliar fungicide application

Relatively little research has been conducted on pesticide application on rubber trees, even in Brazil where yield due to foliar diseases has been worst due to the South American leaf blight caused by *Microcyclus ulei* (Holliday, 1970). *Phytophthora, Oidium* and other pathogens also cause leaf damage, often necessitating fungicide application. Rubber trees present a particularly difficult target for the application of foliar sprays due to tree height (>20 m), the topography of estates (usually sloping ground affecting microclimate and access) and relatively short periods of development when leaves are most susceptible to disease. As an example *M. ulei* infection is worst on leaves less than10 days old, leaves being most susceptible at day 7. Conidia are spread in dry weather by turbulent convective air movement, whereas ascospores are dispersed mainly at night when the relative humidity is high (Chee, 1976). Once an area is infected, trees continue to produce leaves to replace those shed. The infection can escalate to such an extent that whole trees are defoliated. Areas within an estate will be most affected where air movement can concentrate airborne spores or the micro-climate favours infection.

The young susceptible leaves are often "vertical" rather than "horizontal". Thus their orientation will affect the capture efficiency of droplets. Ascospores which are 12-20 x 2-5 µm and conidia 15-650 x 05-10 µm are collected on the foliage so ideally that the droplet sizes should be in the same order of magnitude. However movement