

Fungicides Preserve the Productivity of Rubber Trees

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One of the world's most important commodities is natural rubber. It comes from a large tree (*Hevea*) native to the tropical rain forests of the Amazon Basin. Rubber cultivation in Asia began about 100 years ago. The leading producers are Malaysia, Indonesia, Thailand, India, Sri Lanka and China. Southeast Asia supplies more than 95% of the world's natural rubber. The economic product of the tree is latex, which is extracted by slicing off a thin layer of bark on the trunk. This cut exposes the fresh ends of severed latex vessels and is known as the "tapping cut" [1].

Among 40 known diseases of *Hevea* rubber, about a dozen are of worldwide importance. Rubber clones are screened for resistance to certain diseases before being recommended for large scale planting. In addition to this genetic resistance, fungicides have been found to be highly effective in controlling key diseases of the rubber tree.

Rubber diseases may be classified according to parts they affect — leaf, tapping panel or root. Root diseases spread by root contact with a source of inoculum such as infected woody debris in the soil. The most important root disease is white root rot. The pathogen travels both internally and externally along the roots, which decay in the process, and eventually reaches the collar and tap root, whereupon the tree soon dies [1]. A recent approach to white root disease control is to drench the soil around the tree with a fungicide. Research has demonstrated that applying the most effective fungicides as protectants for white root disease resulted in no infection compared with 95% infection in the untreated plots [2].

The wound exposed by tapping can be invaded by several pathogenic fungi among which species of *Phytophthora* are by far the most important (black stripe is the most severe)[3]. Black stripe leaves large wounds with black lines in the tapping cut and clogs the latex flow. Fungicides are effective in keeping the disease in check and reducing latex spills. Fungicides are applied after every tapping [1].

Phytophthora leaf fall is severe where rainfall exceeds 750 mm per month for June, July, and August. Under such conditions, 75% defoliation is probable in the absence of fungicide treatment, resulting in the loss of up to half of the crop [3]. The predictable nature of the disease in India, Sri Lanka Thailand, and Malaysia necessitates routine prophylactic treatment: one pre-monsoon fogging application confers complete protection against the disease [3]. Thermal fogging also controls all other major diseases that cause leaf fall including powdery mildew (*Oidium*).

References

1. Chee, K.H. 1990. Recent development in rubber disease management. *3rd International Conference on Plant Protection in the Tropics*. March 20-23, 1990, Pahang, Malaysia.
2. Tan, A.M. and I. Hashim. 1992. Fungicide drenching for white-root disease control. *Rubber Research Institute of Malaysia Planters' Bulletin*. 3rd & 4th Quarter.
3. Wastie, R.L. 1975. Diseases of rubber and their control. *PANS*. 21(3): 268.



Tapping rubber



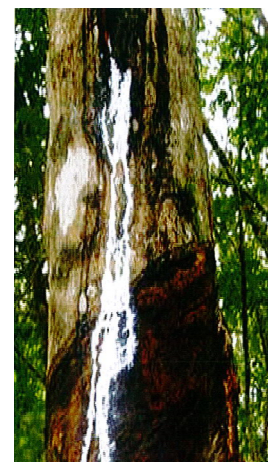
Drenching soil with fungicide to control white root rot



Fogging to control leaf fall



White root rot



Stem cracking due to black stripe