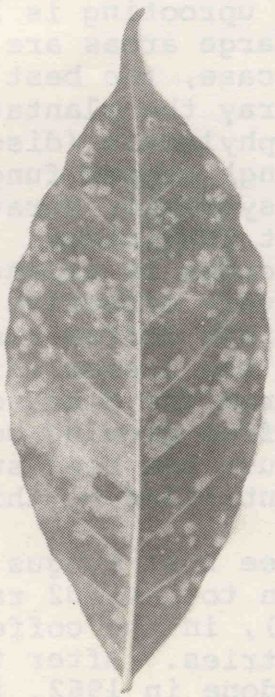
PLANT PATHOLOGY NOTE: NO. 12
THE IMPORTANCE OF QUARANTINE AGAINT COFFEE RUST IN PAPUA NEW GUINEA

By B.N. Muthappa, Plant Pathologist
Agriculture Branch, D.P.I., Konedobu

INTRODUCTION

Coffee rust is an extremely serious disease caused by the fungus *Hemileia vasatrix*. It has been described in an earlier Plant Pathology Note (see HARVEST Volume 6(1): 42-43. Since the disease could be so disastrous for Papua New Guinea's coffee industry, this note repeats some of the earlier information, and gives extra information about the quarantine measures being used to keep the disease out of this country.



A leaf showing typical symptoms of coffee rust.

SYMPTOMS

Coffee rust is easy to recognise by its characteristic symptoms. The disease shows up on the lower surface of leaves as orange-yellow pustules (spots). The pustules contain a powdery mass of spores of the fungus. The spores, like seeds, germinate on the lower surface of the leaves, and cause new pustles. Many such pustules join together and the whole leaf becomes covered by orange-yellow powdery patches.

Affected leaves drop off and the plant becomes weak. This leads to dieback of branches, and no crop in the following season.

ECONOMIC IMPORTANCE

A present, there is no coffee rust in Papua New Guinea, and coffee does very well. However if the disease gains entry into this country and becomes established, it could cause a total loss of the crop, and badly damage the country's economy.

Coffee growing countries in Asia and Africa have yet to gain complete control over this serious disease. Southern and Central American countries are facing the threat of coffee rust since it was reported from Brazil in 1970.

The absence of coffee rust in the plantations of Papua New Guinea seems to be due mainly to the strict quarantine measures observed in this country. The disease is already present in neighbouring countries such as Fiji, New Calendonia, New Hebrides, Philippines and Indonesia. Conditions in Papua New Guinea are very favourable for its spread. Therefore, it is most important to keep a constant watch throughout the country, to keep away the threat of coffee rust.

QUARANTINE REGULATIONS

Papua New Guinea has strict quarantine procedures to exclude the coffee rust pathogen (organism causing a disease). Under the existing rules, any plants or plant parts, including seeds, are subject to inspection by the Quarantine Officers at the port of entry. If any plant or plant part is found to be diseased, or is suspected of carrying any pathogen, it is destroyed immediately.

It is strictly prohibited to import economically important species of plants which are already in Papua New Guinea.

Germplasm (the part of a cell which can pass on the special characters of a plant) is sometimes imported. This is done to a limited extent only after thorough studies of material. The subject is discussed in detail by Dr Dorothy E. Shaw in *The Plant Quarantine Barrier and Some Breaches in Papua New Guinea* (1976). This publication should be consulted while dealing with the quarantine against coffee rust.

FURTHER MEASURES

The following measures should be of use in addition to the existing quarantine regulations.

It should be totally prohibited to import any vegetative (growing) part of a coffee plant from countries where coffee rust is endemic.

Seeds should be obtained for the introduction of new germplasm. When importing coffee seeds, they should be accompanied by a phytosanitary certificate from the country of origin. At the receiving port, the seeds should be treated with seed dressing chemicals or soaked with anti-rust fungicides, before sowing the seeds to raise seedlings at the quarantine station, Laloki.

If spores are brought into the country by wind, and they survive to establish the disease, then eradication methods must be used.

If the disease shows up on a few isolated plants, it can be eradicated by uprooting and destroying the affected plants. However, uprooting is less useful if large areas are affected. In this case, the best method is to spray the plantations with prophylactic (disease-preventing) copper fungicides, or with systemic, curative and eradicant fungicides. The use of fungicides is expensive, but gives a very effective protection against coffee rust, compared to the losses which could result from the disease. In other coffee growing countries, coffee rust has been successfully controlled by this method.

The coffee rust fungus is so far known to have 32 races (strains), in the coffee growing countries. After the race testing done in 1962, it is not fully known yet which of Papua New Guinea's coffee varieties are affected by which other races of coffee rust fungus.

The Plant Pathology Section of the Department of Primary Industry is taking steps to have Papua New Guinea's coffee varieties tested for susceptibility/resistance to the different races of coffee rust. These tests are carried out at the Coffee Rust Research Centre, Oeiras, Portugal. This exercise will help in planning long term control measures and in breeding varieties of coffee resistant to coffee rust.

If you discover an outbreak of coffee rust in your area, you should immediately contact the Plant Pathology Section, D.P.I., P.O. Box 2417, Konedobu, for advice and assistance.

Copies of this Plant Pathology Note, and of others in the Series are available from the Publications Officer, Publications Section, D.P.I., P.O. Box 2417, Konedobu.