PLANT PATHOLOGY NOTE: NO. 25
RICE BLAST

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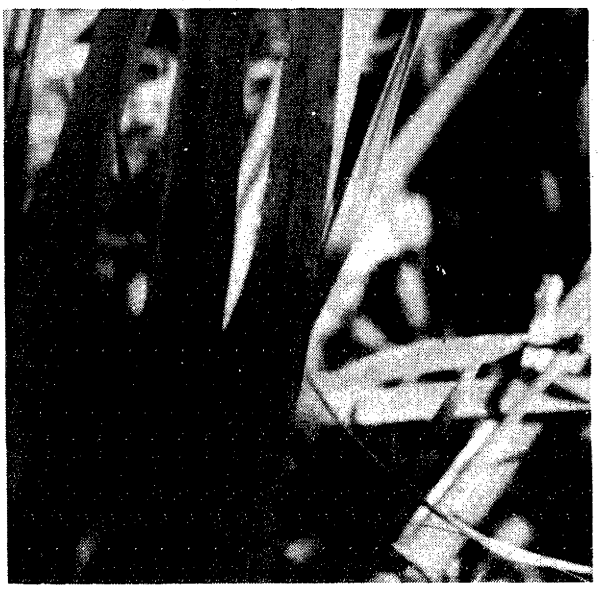
INTRODUCTION

Rice blast is caused by the fungus *Pyricularia oryzae*. It is considered to be the most serious disease of rice. It is found in most countries where rice is grown and is extremely destructive under suitable conditions. Rice seedlings or plants at the tillering stage (when the flowering stem is beginning to grow) are often killed. If conditions are favourable for the fungus, over half of the expected yield may be lost.

Until recently Papua New Guinea was lucky to be one of the few countries in the world free from rice blast. In May 1983 a severe outbreak of the disease was observed at a single location in Rigo, Central Province. Although the infected crop was destroyed, the disease had already spread to the surrounding grassland, making eradication (complete destruction) virtually impossible.

SYMPTOMS

The first signs of rice blast are small, water-soaked, whitish-grey dots. They appear on leaves, nodes (joints) and different parts of the panicles (flower heads) and grain. Under damp conditions these dots quickly grow bigger. They remain grey for some time.



Leaf of a rice plant showing symptoms of rice blast

Fully developed spots are typically 1-1.5 cm long, and 0.3-0.5 cm wide, with pointed ends. The whitish-grey centre is surrounded by a brown or reddish margin. If the rice is growing under moist, shaded conditions, a yellow area forms around the spot.

Resistant rice varieties can become infected but develop only very small pin-sized brown specks, which do not affect plant growth.

In tropical countries, seedlings in nurseries are most likely to be attacked by rice blast. After transplanting, very bad infections are not so

common. Plants growing in dry soil are attacked more than those growing in wet soil. High humidity is also favourable for the fungus.

Bare patches in a crop of rice which has been attacked by rice blast

SPREAD OF THE DISEASE

A rice plant is infected when a spore germinates on a leaf surface. An infection tube grows into the leaf and the fungus grows quickly within the leaf. The leaf tissue is killed to produce the characteristic spots.

About 6 days after infection, the fungus in the spotted areas produces new spores. A typical spot produces 2000-6000 spores every day for 14 days. Each spore is capable of infecting a healthy rice plant.

More spores are produced at high humidity. They are normally released from the diseased tissue at night. Spores are spread by wind - the stronger the wind, the greater the area of spread. Spores have been collected at an altitude of 2300 m but most stay near the ground.

In temperate regions the spores can remain alive in the rice straw. Under dry conditions spores can survive for over 1 year. Under conditions of high humidity the survival rate is much lower. In the tropics if two rice crops are planted each year, live spores can be found in the air throughout the year.

In the absence of rice, the fungus can survive and cause disease in a number of grassy weeds. The disease can also be easily spread by infected seed. This is probably one of the main ways it is spread from country to country. The origin of the disease outbreak in Papua New Guinea is not known.

CONTROL

Rice blast can be effectively controlled using a spray of 1% Bordeaux mixture or 1% copper oxychloride.

Rice plants resistant to the disease have been developed. However, a big problem in breeding for resistance is that there are a number of different races (kinds) of the fungus. A rice variety resistant to one race may not be resistant to another race of the same fungus. Therefore potentially resistant varieties should be screened locally to check for resistance to the local race of rice blast fungus.

Rice blast is a disease new to Papua New Guinea. Up to now it has been found in only one place in Central Province. However, it is very important that the Chief Plant Pathologist be informed of any further outbreaks of this important disease wherever they may occur.

If you think your rice plants are suffering from this disease

send a diseased plant to the address given below.

Samples should be put in a paper bag or securely wrapped in newspaper and then placed in a polythene bag and sealed tightly. For posting to the laboratory, wrap the plastic bag well in brown paper, or put it in a cardboard box and wrap it securely.

FURTHER INFORMATION

For further information on rice blast, please contact the Chief Plant Pathologist, Plant Pathology Section, Department of Primary Industry, P.O. Box 417, KONEDOBU.

Copies of this Plant Pathology Note and of others in the series are available from the Publications Officer, Publications Section, Department of Primary Industry, P.O. Box 417, KONEDOBU.