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VIRUS DISEASES OF TARO

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INTRODUCTION

There are three important virus diseases of taro (*Colocasia esculenta*) in Papua New Guinea. These are: dasheen mosaic virus (DMV); 'alomae'; and 'bobone'. Dasheen mosaic virus is widespread in Papua New Guinea but it does not appear to be a major problem. Alomae and bobone, on the other hand, are found only in certain coastal and lowland areas but can cause serious losses.

DASHEEN MOSAIC VIRUS

Dasheen mosaic is caused by a long bacilliform (rod-shaped) virus.

Symptoms

A mosaic pattern appears on the leaves (see photograph). It is often localised and may not appear on all leaves of the plant. The mosaic pattern may also appear as 'feathering' along the main leaf veins.

Spread of the disease

Dasheen mosaic is transmitted by several species of aphids of which two, *Aphis gossypii* and *Pentalonia nigronervosa*, are known to occur in Papua New Guinea. Dasheen mosaic is also known to infect many other plants related to taro. So other taros such as *Alocasia* and *Xanthosoma* may act as a reservoir for the disease.

Dasheen mosaic virus : typical feathery mosaic pattern

Control

Dasheen mosaic is not generally a problem in Papua New Guinea. However, diseased plants should be pulled out and destroyed to help reduce the spread of the disease.

ALOMAE AND BOBONE

Bobone is caused by a large bacilliform virus, while alomae is caused by the bobone virus together with another smaller bacilliform virus.

Symptoms

In the early stages, plants

Alomae : stunted plant with dying leaves and petioles.

Bobone : stunted plants with curled and twisted leaves.

infected with alomae usually show a feathery mosaic on the leaves. Young leaves are often crinkled and fail to open normally. Infected leaves become thicker than normal with enlarged veins which may also be distorted. As the disease progresses, leaves fail to open and start to die from the tip down until the petiole and finally the whole plant dies (Gollifer and Brown, 1972).

The symptoms of bobone are similar to those of alomae except that infected plants tend to be more stunted, with curled twisted leaves. Although the leaves and petiole are distorted they remain dark green. Reports from the Solomon Islands (Gollifer and Brown, 1972) indicate that plants infected with bobone usually recover from the disease, although yield losses of 25% may result (Jackson, 1978).

Spread of the disease

The diseases may be spread either through the use of infected planting material or by insect vectors. Latent (i.e. symptomless) infections may occur and therefore infected planting material may be used unknowingly. For this reason planting material should *never* be taken from an area where the disease is present to an area where the disease is absent.

Work on the insect vectors in the Solomon Islands (Gollifer *et al.*, 1977) has shown that the larger of the two bacilliform particles is easily transmitted by the leaf hopper *Tarophagus proserpina*. This insect appears to be common throughout Papua New Guinea, even in the highlands where alomae and bobone are not yet present. The smaller of the two particles can be transmitted by the mealybug *Planococcus citri*, but not very efficiently.

Control

1. Diseased plants should be pulled out and destroyed either by burning them or burying them deeply. If this is done regularly and as soon as the symptoms appear it can provide good control (Jackson, 1978).

2. New gardens should be planted well away from existing, infected gardens otherwise large numbers of infected hoppers are likely to invade the new plantings making control very difficult.

Jackson (1978) also recommends that all but one of the petiole bases should be removed from planting material since these contain the eggs of *Tarophagus*.

No suitable cultivars resistant to alomae have yet been found.

There are no chemicals available that can kill the viruses in the plants. Under certain circumstances it may be possible to control the diseases by the use of insecticides against the vectors but this would be costly and can not be recommended for subsistence agriculture.

FURTHER READING

Gollifer, D.E. and Brown, J.F. (1972). Virus diseases of *Colocasia esculenta* in the British Isles. *Plant Diseases Reporter*, 56 (7): 597-599.

Gollifer, D.E. *et al.* (1977). The occurence and transmission of viruses of edible aroids in the Solomon Islands and the Southwest Pacific. *PANS*, 23 (2): 171-177.

Jackson, G.V.H. (1978). Alomae and bobone diseases of taro. *South Pacific Commission Advisory Leaflet* No. 8.

Shaw, D.E., Plumb, R.T. and Jackson, G.V.H. (1979). Virus diseases of taro *(Colocasia esculenta)* and *Xanthosoma* sp. in Papua New Guinea. *Papua New Guinea Agricultural Journal*, 30 (4): 71-97.

Zettler, F.W. and Jackson, G.V.H. (1979). Dasheen mosaic virus. *South Pacific Commission Advisory Leaflet* No. 10.

FURTHER INFORMATION

For further information about virus diseases of taro, contact the Chief Plant Pathologist, D.P.I., P.O. Box 2417, Konedobu.

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