PEST ADVISORY LEAFLET NO. 3

Plant Protection Service
Secretariat of the Pacific Community

1999

Taro leaf blight

Taro leaf blight is caused by the fungus *Phytophthora colocasiae*. It is a very important disease, which prevents farmers growing taro in parts of Papua New Guinea, Solomon Islands and Samoa. It is particularly serious where rainfall is over 2,500 mm and spread evenly throughout the year.

Within the SPC region, taro leaf blight is present in American Samoa, the Federated States of Micronesia, Guam, Northern Mariana Islands, Palau, Papua New Guinea, Samoa and Solomon Islands. Reports of the disease in Fiji have not been confirmed.

SYMPTOMS

A small circular speck, brown on the upper leaf surface and water-soaked below, is the first sign of the disease. Infections often begin on the lobes and sides of the leaf where water collects. The spots enlarge, become irregular in shape, and are dark brown with yellow margins. The initial spots give rise to secondary infections (Fig. 2) and, soon after, the leaf blade collapses and dies.

Fig. 2. Secondary infection of taro leaf

Fig. 1. Taro plant with blight

Spores are produced at night and, in the morning, the areas where they form can be seen around the spots. Clear yellow to red droplets ooze from the spots and develop into dark brown hard pellets as they dry (Fig. 3). This is a characteristic of the disease. Spores may be trapped inside the pellets.

Usually, petioles are not attacked, but later collapse as the leaf blade is destroyed. In American Samoa and Samoa, petiole infection is common as the varieties are very susceptible to the disease. The fungus can also cause a post-harvest corm rot which is difficult to detect unless corms are cut open. The rots are light brown and hard.

Fig. 3. Dried exudate deposits on underside of taro leaf

EFFECT OF THE DISEASE

Plants with the disease have fewer leaves than normal. Healthy leaves usually last up to 40 days; those infected by the fungus 10–20 days. Instead of six to seven leaves, infected plants have only three or four. As a consequence, yields may be 30–50% lower. The disease also reduces the size of the planting material, and this in turn affects corm yield. Storage rots destroy the corm within 5–10 days from harvest.

INFECTION AND SPREAD

Spores of the fungus are moved in wind-driven rain and dew to new areas of the same leaf, to nearby plants or to new plantings. Rapid spread of the disease is favoured by temperatures and relative humidities of 25–28°C and 65% during the day, cooler temperatures (20–22°C) and 100% humidity at night when the spores are produced, and light rains or heavy dew in the morning to scatter the spores and allow germination and infection. The spores are very delicate and on sunny days they shrivel and die within 2–3 hours as humidity falls.

Long distance spread of the disease can occur on planting material and inside corms. In some countries, petioles become infected before harvest; in

others, infections probably occur later, perhaps when the plants are harvested and the leaves are trimmed. Corms are infected from spores washed from leaf infections into the soil. At harvest, the spores invade the corms where the suckers are removed.

CONTROL

1. Cultural methods

Site selection. Crops should not be planted near those that are diseased. Taro plots, gardens or farms, should be isolated as far as is practical. Ideally, they should be surrounded by forest to act as a barrier to infection. Where this is not possible, farmers should try and collaborate by planting at the same time. Additionally, gardens in some areas near the sea seem to have less infection, perhaps due to the drying effect of on-shore winds.

Sanitation. Diseased leaves (or just the infected part) should be removed as soon as they are seen to prevent the spores from spreading to healthy leaves. Plants should be inspected at least twice a week. It is most important to inspect the plants 3 to 4 days after heavy rains, gales or cyclones. At this time new infections should be clearly seen. Infected leaves should be taken from the plantation, burnt or buried.

Wide spacing of plants may help in reducing the disease, but often gives little benefit when conditions are especially favourable for the fungus. Crop rotation is not an effective control measure as the fungus is not soilborne.

2. Resistant cultivars

Taros from the Federated States of Micronesia and Palau are more resistant than those grown in other Pacific islands. They can be obtained from regional tissue culture laboratories. Plants with resistance to the disease are being bred in Papua New Guinea, Samoa and Solomon Islands.

3. Chemical control

Where rainfall is high, fungicides are likely to be needed to control the disease. Before use, infected leaves should be removed. The following fungicides have been found to be effective for taro leaf blight control in Pacific islands. The chemicals are given in terms of their active ingredients.

Protectant fungicides:

• Copper oxychloride at 2.25 kg in 100–200 litres of water per hectare applied by motorised knapsack mistblower. Applications should begin when infections first occur, and then at 7–14 day intervals, through the stage of full leaf canopy, until 2–3 weeks before harvest.

• Mancozeb at 4 kg in 750 litres of water per hectare applied by hydraulic knapsack sprayer, or in 100–200 litres of water if applied by motorised knapsack mistblower.

Systemic fungicides:

• Metalaxyl at 0.45 kg per hectare as a 0.3% solution of Ridomil Plus 72WP (12% metalaxyl and 60% copper oxide) applied by hydraulic knapsack sprayer. Applications should begin 60 days after planting, or when taro leaf blight is first seen, and then at 14-day intervals until 2–3 weeks before harvest.

• Phosphonic acid at 3.6 kg per hectare applied by hydraulic knapsack sprayer or motorised knapsack mistblower. In Samoa, the following rates of a product containing 40% phosphorous acid are used: 150 ml per 15 litres for hydraulic knapsack sprayers (750 litres per hectare); or for motorised knapsack mistblowers, 300 ml per 12 litres (200 litres per hectare). Applications should begin when 5–10% of the plants show symptoms, and then at 4-week intervals during the wet season, with sprays of mancozeb (Manzate at 7 g/litre) applied in weeks three and four.

The advantage of using a mistblower rather than a hydraulic knapsack sprayer is that large areas can be sprayed rapidly. This is important in high rainfall areas. There is generally less chance of phytotoxicity with this method of spraying. For both types of application, a wetting agent should be added to the fungicide to improve leaf coverage. Wetting agents should be applied at manufacturers' recommendations.

4. Control of storage rots

Post-harvest decay caused by *P. colocasiae* can be prevented by controlling taro leaf blight before harvest and by placing harvested corms, with about 30 cm leaf stalks attached, in polythene bags. Kept this way, the taro keep growing and this prevents entry of rot-causing fungi and bacteria. If rots still occur, corms can be treated with a dilute solution of bleach (1% sodium hypochlorite) for two minutes and then dried before being placed in polythene bags.

QUARANTINE PRECAUTIONS

Strict quarantine measures must be observed to prevent the spread of the disease to countries where it does not occur. Any movement of planting material between countries should be limited to sterile plantlets growing in a tissue culture medium, and they should be tested for viruses.

Taro leaf blight should not be confused with shot-hole, a disease caused by species of *Phoma*. Shot-hole occurs throughout the region. Brown spots, up to three centimetres diameter with yellow borders, develop on the leaves. At first, they look like those of taro leaf blight, but the spots do not enlarge further, they rarely join together, and their centres fall out to give the shot-hole effect.

This leaflet was written and revised by Dr. G. V. H. Jackson (gjackson@wr.com.au). The photographs were taken by Dr. D. Hunter, University of the South Pacific, Apia, Samoa.

This leaflet was produced by the Pacific Plant Protection Service of the Secretariat of the Pacific Community, Private Mail Bag, Suva, Fiji Islands, Tel: (+679) 370733; Fax: (+679) 370021; E-mail: pps@spc.org.fj, from whom further information and additional copies may be obtained.

Original text: English

Printed with financial assistance from the European Union.

Cataloguing-in-publication data

Jackson, G. V. H.
Taro leaf blight / by Jackson, G. V. H.
(Pest advisory leaflet/Secretariat of the Pacific Community)

1. *Colocasia esculenta* 2. Taro - Diseases and pests - Oceania
I.Secretariat of the Pacific Community II. Series III. Jackson, G. V. H.

633.495 AACR2
Agdex 171
ISBN 982-203-682-5
ISSN 1017-6276