Taro Leaf Blight

Pests and Diseases of American Samoa
Number 3

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General Taro Production

- World taro production in 1994 was 12.7 billion lb.; China harvested 3 billion lb., Hawai'i, 6.1 million lb.
- In 1989 taro, *talo* in Samoan, was the most common field crop in American Samoa. It covered 1,240 acres and produced 619,000 lb. for sale in the central market, Fagatogo; no taro is exported from American Samoa.
- In 1993, American Samoa produced 786,000 lb.; this declined to 48,185 lb. in 1994 and 11,000 lb. in 1995 due to taro leaf blight disease.
- Production increased slightly in1997 with the introduction of blight resistant taro cultivars from Palau; taro brought to the central market in 1998 totaled 26,693 lb.
- Before 1994, taro sold for $.50/lb.; when it returned to the market in 1998, taro sold for $2.25/lb.

Families grow and eat most of the taro they produce; the rest is sold in markets or roadside stands, prepared for major social events (*fa'alavelave*) or given as gifts.

Production Regions

Taro is grown on all islands in the territory, mainly by the "dry land" method (Fig. 1).

Fig. 1. Blight-resistant taro in a Land Grant field trial.

"Wetland" taro is grown on the small island of Aunu'u and on Ofu, Olosega and Ta'u. Taro fields are not flooded, however, as is typical in most lowland or wetland production. In 1990, 7,966 acres were farmed in American Samoa; 965 acres were planted in taro. Most of this area, 79%, was on the main island of Tutuila.

Taro Leaf Blight — *Lega, Lautalo Mu*

An epidemic of taro leaf blight struck American Samoa and (Western) Samoa in 1993-1994. All Samoan taro cultivars were susceptible to the fungus, *Phytophthora colocasiae*, and production was devastated. At the time, taro was the main agricultural export of Samoa: in six months, taro production was reduced to almost zero in both Samoas. *P. colocasiae* is a "water mold", most damaging in cool, wet weather when wind-driven rains spread its spores from leaf to leaf and plant to plant (Fig. 2). Spores either enter the plant leaf immediately, or swim in a film of free water on the leaf surface before entering. Taro leaf blight is similar to other airborne diseases caused by *Phytophthora* species, such as potato late blight and Phytophthora rot of breadfruit. Potato late blight is the major limiting factor in potato production worldwide. It is controlled by integrated management practices, including crop sanitation, resistant varieties, and disease forecasting to optimize fungicide application. Against taro leaf blight, however, only resistant varieties have been effective in American Samoa.

Fig. 2. Leaf blight lesions with whitish rings of spores.

Cultural Control: Crop sanitation and roguing, removing infected plant parts or whole plants from the field, are possible measures against taro leaf blight. Used early in the season or during mild infections, they can limit the severity of leaf blight. During moderate to severe infections, however, removing infected leaves becomes counter-productive,

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reducing corm yield even more effectively than leaves lost to the disease. Increasing spacing between plants may slow spread of the disease by lowering relative humidity and wetness in the field and by decreasing spore transfer due to leaf contact. The movement of spores in a field during heavy rains and wind, however, quickly leads to the same level of disease (Fig. 3). Total yield is reduced with wider spacing as fewer plants are grown in the same area.

Fig. 3. Taro exudate contains spores of the leaf blight fungus that may increase spread of the disease.

Biological Control: Several years after the epidemic, taro cultivars resistant to leaf blight were sent to American Samoa from the College of Tropical Agriculture and Human Resources, University of Hawai'i at Manoa. The American Samoa Government Department of Agriculture and American Samoa Community College Land Grant Program tested, multiplied and distributed thousands of these taro cultivars to farmers during late 1997 and early 1998. These cultivars average six to eight stolons (lauvai) per plant. The initial plants have been multiplied many times by growers and fields are again filled with taro.

Twenty resistant cultivars were originally collected from the Republic of Palau and numbered for testing by the University of Hawai'i. Due to the continued use of numbers during tissue culture production, initial screening trials in Hawai'i, and plant distribution, the cultivars are still known on American Samoa by their numbers. The most popular cultivars among farmers are P1, P5, P7, P10, and P20. We are currently field testing disease resistance and agronomic characteristics of these cultivars under various growing conditions in American Samoa (Fig. 1).

Chemical Control: Chemicals are not used against taro leaf blight in American Samoa for several reasons. First, spraying every two weeks for 3-5 months is neither cost-effective nor compatible with a subsistence agriculture system. Second, sprays are not effective when applied just before, or during, the frequent periods of heavy rainfall common in many parts of the territory. Under epidemic conditions, such as occurred in 1993-1994, chemical treatments are unable to control the disease (Fig. 4). Another reason to limit pesticide use on small islands and atolls is possible contamination of the underground fresh water supply. Finally, metalaxyl is the only effective chemical registered with American Samoa Environmental Protection Agency against *Phytophthora* and prolonged use of this fungicide has led to pathogen resistance in other countries.

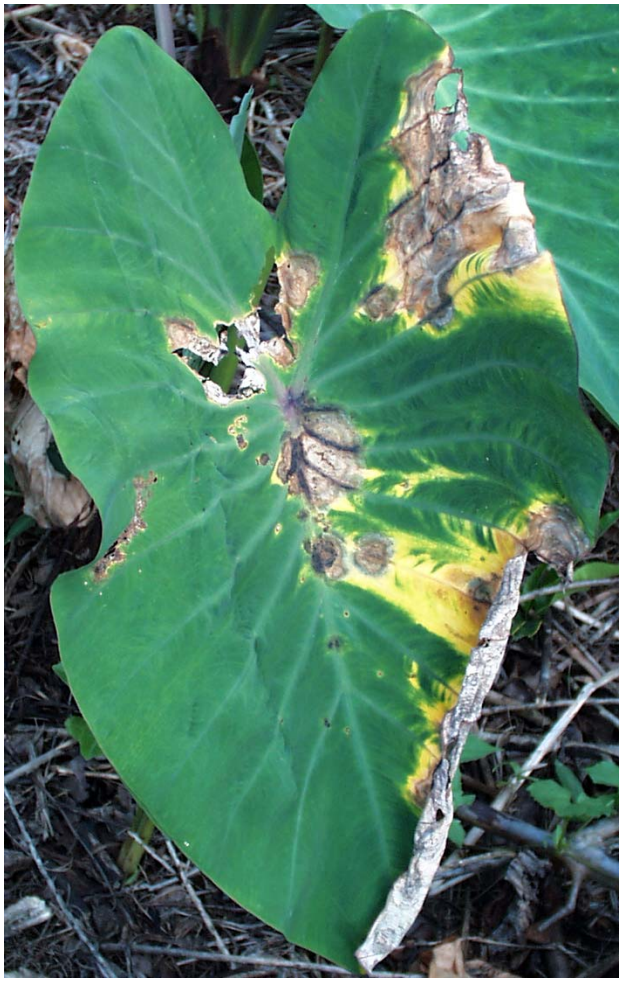

Fig. 4. Taro leaf being destroyed by leaf blight disease.

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For further information on this brochure, please contact American Samoa Community College, AHNR Extension Service or division of Plant Pathology: 684-699-1394/1575, fax 684-699-5011.

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