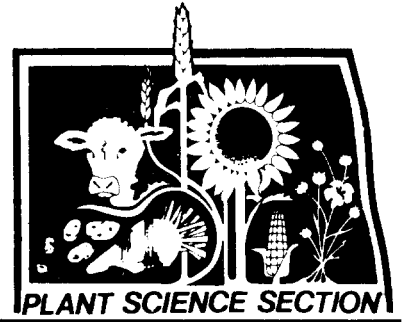




Cooperative Extension Service

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PLANT SCIENCE SECTION

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Erwinia chrysanthemi

Leaf Rot of Philodendron

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Symptoms

Philodendrons are very important tropical decorative plants. Common Philodendrons include *P. scandens*, the most popular small-leaved climbing Philodendron, the deeply lobed-leaf *P. selloum*, the hybrid *P. 'Burgundy'*, and more than a dozen others. Philodendron means "tree lover" in Greek, because these species grow up tree trunks and onto limbs in their native tropical habitat.

Philodendrons are generally resistant to pests. Some diseases have been noted on the species, including leaf spot, stem rot, and root rot (each caused by a different fungus), a bacterial stem rot, and a bacterial leaf rot caused by *Erwinia chrysanthemi*. Strains of this pathogen more commonly attack carnation (causing wilt), Chrysanthemum (causing blight), and Dieffenbachia (causing stem and leaf rot).

The strain of *E. chrysanthemi* attacking Philodendron was first observed in commercial nurseries in Florida in 1952, where it was causing economic losses of *P. selloum*. Since that time, it has also been found on several other large-leaf Philodendron species in Florida, where it has become a widespread, though sporadic, problem in greenhouses. The strain attacking Philodendron does not seem to harm Dieffenbachia, Chinese evergreen, Peperomia, Nephthytis, artillery plant, pothos, or Schefflera.

The disease is first noticeable as small, irregular water-soaked areas on the lower surface of the leaves. The spots enlarge quickly and large areas of the leaf, or the whole leaf, may be rapidly attacked. In addition, blisters containing water often develop, followed by the total disintegration of the leaf into a slimy, soft mass of tissue. The leaf rot may kill the plant although it usually results only in an unsightly condition.

These symptoms occur most commonly under warm to hot and humid to wet environments. When the disease attacks Philodendron in cooler, drier environments, symptoms include lesions which become dry and yellow to tan in color. These lesions have distinct yellow borders, and the organism can remain alive in them. Lesion-drying does not indicate the end of the problem and if the environment becomes warm and wet, the lesion borders will again become water-soaked, and the spots will increase in size.

Petioles (leaf stems) can also become water-soaked and mushy and rapidly collapse. Petiole decay and collapse may occur without symptoms appearing on the leaves; the petioles can be invaded not only from the leaves but from the roots as well. Attack of the succulent petioles usually causes rapid disease progress.

Early research on this disease indicated that Philodendron stems, crowns, and roots were not attacked by *E. chrysanthemi*, but this is not true. *E. chrysanthemi* can rot the roots and enter basal stems of *P. selloum* and probably some other species. The root rot phase causes a decrease in leaf number and weight and resembles root rot caused by *Pythium* spp. *E. chrysanthemi* can even enter the fruit, so "home-grown" seed, though rare, should not be used if the disease was present at some time on the plant.

Young seedlings often become infected in seed flats of propagating beds in nurseries, with a resulting rapid spread of the disease. Spread by root infection from infested soil can be responsible for the uniform and rapid development of the disease in mass greenhouse production.

Varietal Resistance

The disease has been found in commercial nurseries only on large-leaved Philodendrons. Tests with artificially inoculated plants indicate *P. selloum*, *P. meliononi*, *P. squadmiferum*, *P. panduraeforme*, and the hybrid *P. wendlandii* × *P. lacinosum* are very susceptible, while *P. hastatum* are moderately susceptible to *E. chrysanthemi*. The small-leaf *P. oxycardium*, *P. pertusum* (*Monstera deliciosa*), *Monstera friedrichstahli*, and *P. andreanum* are resistant (rarely attacked).

Control and Prevention

There are a number of measures which can be used, with variable success, against *E. chrysanthemi* on Philodendron, but the best preventative measure includes growing Philodendrons under conditions which will keep them healthy and able to resist infection. Philodendrons tolerate a home environment of dry air and no direct sunlight quite well and exist in temperatures of 55-85F, but prefer 60-80F. Environmental conditions which should be avoided include plant crowding, high temperatures, high humidity, and poorly ventilated areas. These factors favor the disease, which can become visible within 24 hours. Moving infected plants to a cooler, less humid area will slow *E. chrysanthemi*'s development on Philodendron or may even temporarily halt it, allowing additional time for control measures to take effect.

Philodendrons prefer a porous, humus, soil medium and grow very well in sphagnum moss (fer-

tilize well) which allows rapid rooting and decreases disease incidence. Plants should be repotted, preferably in March, to larger pots when the roots increase in size and fill the pot. Allowing the top ½ inch of soil to dry between waterings and not watering foliage or misting the plant slows disease development. During the short mid-winter rest of Philodendrons, water only enough to prevent drying and apply fertilizer as needed. Water cuttings sparingly until 3 months old. When making a cutting, cut below a node and remove the leaf and petiole growing from that node—no leaf should touch the soil.

Materials containing streptomycin at 200 ppm prevent the bacterium from attacking the plant. Streptomycin at 200 ppm, if repeated every 4 days, can control the disease when it first appears. A foliar application of antibiotics like streptomycin may give poor control if the organism is present throughout the plant rather than only in the leaves and petioles. Fungicides have not been successful in controlling the disease. Applying the streptomycin compounds as a soil drench or root dip will not prevent or control the disease.

Another effective control method includes removing and destroying infected leaves and badly infected plants. If more than one-third of the plant is infected, pruning is necessary. Pruning must be done over an extended period of time to prevent additional plant stress. If pruning is warranted, the pruning equipment must be disinfected between each cutting by dipping into freshly made sodium hypochlorite (laundry bleach) and water (1 part bleach to 9 parts water).

Soil which contains or has contained diseased plants should be sterilized with heat after plant debris is removed before it may be reused safely. Avoid taking cuttings from plants showing any sign of the disease. Healthy appearing seedlings taken from infected seed flats may contain the pathogen and be visibly attacked later or cause infestations later in a nursery. Particularly in greenhouse operations, only seed which is free of *E. chrysanthemi* should be used since the disease can begin within the seed. Other organisms such as slugs are thought to carry disease from plant to plant and must also be controlled.

If these general growing instructions are followed, your Philodendrons, hearty by nature, will be even more equipped to prevent *E. chrysanthemi* infection and other disease and insect problems as well.