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Texas Agricultural Extension Service

Texas Citrus Diseases Affecting Localized Parts of Trees

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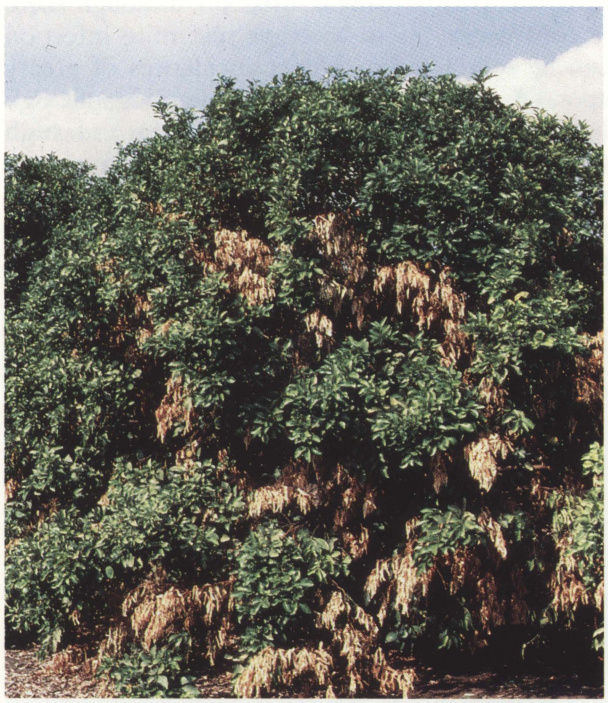
Twig Dieback

Twig dieback can be caused by fungi, although non-pathogenic factors probably play a more important role. As a result, fungal infection is often secondary, following freeze damage or damage resulting from mechanical or chemical injury. Other factors that can damage twigs are excessive fertilization, moisture stress and damage to the root system by cultural practices or heavy nematode damage. Affected young branches die back 1 inch or more from the tip, sometimes showing gum exudation. Damage by twig dieback usually is not severe.



Severe reaction to twig dieback on Star Ruby grapefruit.

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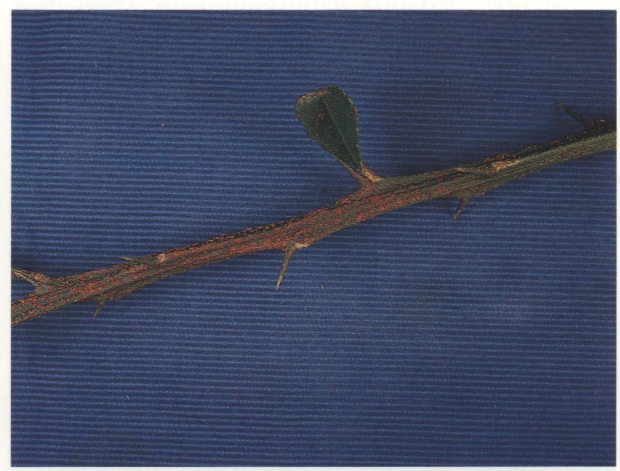
Melanose

Melanose, caused by the fungus *Diaporthe citri (Phomopsis citri),* is a twig, leaf and fruit disease of economic importance in the eastern and central parts of the Valley where humidity is high. The disease attacks all commercial varieties of citrus, but grapefruit appears to be more susceptible than oranges. The fungus attacks young, tender twigs, leaves and fruit, especially during periods of high humidity. Mature, hardened tissue usually is resistant to infection. Melanose symptoms on leaves first appear as small, circular, dark depressions with a yellow margin. Later, the spots become raised and turn dark brown.

Leaves turn yellow and may drop prematurely. Spots begin on twigs as on leaves, but become more raised than on leaves. In severe cases, twigs may die. Melanose spots on the fruit are at first small, light brown and sunken. Later they become dark and raised. When several spots are close together, the surface feels rough.



Citrus twig showing severe symptoms of melanose.

This roughness was cause for the name "sandpaper" melanose. Spots sometimes develop into a tear-streaked pattern, resulting from infection

caused by spores washed down over the fruit surface by water drops during heavy dews or light rains. In other cases, large areas of fruit surface crack in more or less irregular patterns, resulting in "mudcake" melanose.

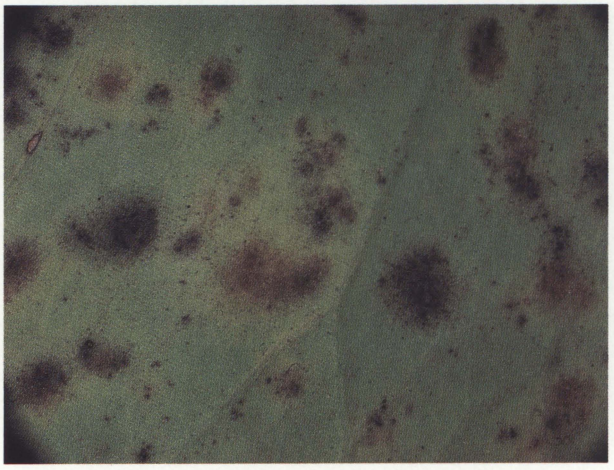
Abundant sporulation takes place in infected or dead tissue during periods of high humidity. Melanose usually is worse in years following a freeze because there are numerous dead twigs where the fungus sporulates freely. Disease incidence and severity usually are most serious in the north and northwest quadrants of trees. Prevailing drying winds from the southeast and the morning sun result in prolonged wetness in the opposite side of the trees, allowing more time for the infection process. Severe outbreaks of melanose can be traced to rainy periods occurring in the spring after spores have developed and while tissues remain susceptible. However, there is evidence that melanose infection can occur late in the season, even after fruit is more than 2 inches in diameter, provided that rain and cooler than normal weather prevails during summer and fall months.

Melanose usually is controlled in the Lower Rio Grande Valley by a single application of a fungicide after bloom or petal fall and before the fruit averages 1/2 inch in diameter. Under adverse conditions, such as those mentioned above, more than one application may be necessary.

Greasy Spot

Greasy spot is a leaf disease caused by the fungus *Mycosphaerella horii,* a weak parasite. The spots appear yellow initially, then turn dark and

Typical symptoms of greasy spot infection.



A close-up view of greasy spot on citrus leaves.

appear slightly raised and greasy. With severe infection, leaves may turn yellow and drop prematurely. The fungus responsible for greasy spots also can cause rind blemishes on some varieties. These blemishes usually are small. However, on grapefruit the spots are large and sometimes coalesce, resulting in a condition commonly known as greasy spot rind blotch and also pink pitting. Rust mite injury and humid weather predispose most varieties to fungal infection, although there is controversy as to whether rust mite infection can be correlated to higher incidences of greasy spot. A combination of long periods of high humidity (in excess of 90 percent) and high temperature following heavy infestation of rust mites usually results in infection by the greasy spot fungus. The disease, however, will not become evident until several months after infection.

Control is possible by spraying in the summer with neutral copper or oil.

Sooty Mold

This is not a true disease because the several fungi associated with it do not feed on the tissues of citrus trees. Rather, the fungi feed on rich honeydew excreted by insects such as aphids, brown soft scale and whiteflies. The amount of sooty mold is directly proportional to the number of honeydew-excreting insects present. A heavy sooty mold coating on the fruit can result in fruit downgrading and economic loss to the grower. Heavy leaf coating can retard growth by interfering with photosynthesis and other physiological func-

Sooty mold on leaf, branch and fruit.

tions of the leaf. Light fruit set and reduced yields often result.

Control measures are directed at insects which secrete honeydew, thus, preventing the development of sooty mold fungi.

Scab

Scab, caused by the fungus *Elsinoe fawcetti,* is a disease of minor importance in Texas. The disease is more severe on lemons, somewhat troublesome on grapefruit, and seldom a problem on sweet orange. Sour orange is highly susceptible, thus, nursery stocks may become infected before young sour orange trees are budded.

Raised, corky lesions on leaves infected with the scab fungus.

Because citrus tissue is susceptible to scab only while young, the disease is mainly confined to new growth. The fruit remains susceptible for longer periods, but seldom is mature fruit affected.

Small lesions appear as translucent dots that later become pustules. As the disease progresses, the pustules turn into warts, consisting of a mass of corky tissue pale tan in color. The leaves become twisted and distorted and the entire young branch may be affected.

Applications of fungicide may be justified in nurseries if scab becomes a problem. The disease is not a problem in commercial orchards in Texas.

Mesophyll Collapse

Mesophyll collapse is a non-pathogenic disorder of citrus of unknown cause. Leaves of both oranges and grapefruit are affected. The disorder begins as translucent, irregular areas of different sizes scattered throughout the leaf blade. One or more light green spots may appear, later turning brown as cells within the tissue die. Only the soft tissue inside the leaf between the veins (mesophyll) collapses at first, giving these areas the translucent appearance. Palisade and epidermal tissues are unaffected initially but may die later.

Symptoms appear readily following periods of low soil moisture and hot dry winds. For this reason, water deficiency is often thought to cause mesophyll collapse, but mite feeding, damaged root systems and excessive transpiration also are associated with mesophyll collapse. Nutritional imbalances also are implicated in mesophyll collapse of citrus.

Citrus Canker

Citrus canker is considered the most important bacterial disease of citrus worldwide, but is not found in the Lower Rio Grande Valley of Texas. The disease became established in the Valley earlier but was eradicated after several years. This disease, caused by the bacterium *Xanthomonas campestris* pathovar *citri,* is highly contagious. It is transmitted easily by infected nursery stock, budwood, leaves, twigs and fruit and even by wind-driven rain, insects, animals, people and contaminated equipment. The disease can be found in leaves, twigs and fruit of almost any citrus cultivar, causing serious damage to the fruit as well as defoliation and general decline of trees.

Raised, corky lesions on leaves at a later stage of citrus canker.

Citrus canker lesions on fruit.

There are several races or strains of the causal agent. These races or strains have varying effects on the many cultivars of citrus. Environmental conditions in an area may prevent some of these strains or races from becoming established, or from causing serious damage to trees or fruit.

If any form of citrus canker were to be found again anywhere in Texas, its immediate and most damaging effect on the citrus industry would be the almost certain imposition of quarantines against the sale of Texas citrus fruit. These quarantine-related regulations would remain in effect until the disease was eradicated or until sufficient evidence was accumulated that its spread poses no threat to other areas. In either case, the marketing of Texas citrus would be seriously impaired for quite some time. Because the disease presently is found in Florida, Mexico, several countries in South America, Japan, South Africa and countries in Asia, the introduction of citrus canker into Texas remains a possibility. For this reason, all efforts must be made to prevent the disease from reappearing in Texas.

Lesions appear on leaves as small, round, blister-like eruptions, having a whitish color at first, but turning to tan or brown with age. A yellow halo commonly surrounds older lesions. As the lesion progresses, a water-soaked, oily area develops around the lesion. Lesions on the twigs are similar to those on leaves, but the areas affected are bigger. Raised, tan, necrotic tissue commonly is surrounded by oily, water-soaked margins. The most conspicuous symptoms are on the fruit. Although early infection results in symptoms similar to those found on leaves, blister or crater-type symptoms are more pronounced. Infection usually is confined to the surface of the fruit. Other disease-causing organisms may become established, causing severe fruit drop.

The most effective control practice for citrus canker is to prevent its introduction into an area known to be free of the disease. Quarantines have been effective in keeping canker out of certain areas. The outbreak of the disease in previously disease-free areas can usually be traced to the introduction of diseased plant material or contaminated equipment from other places. If the disease gains entrance into an area and is detected, its eradication must be attempted by all available means. Failing to do so, other expensive and somewhat ineffective practices must be used, such as developing resistant varieties, using fungicidal sprays, taking advantage of certain cultural practices and using strict phytosanitary practices.

Acknowledgment

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