



## *Importance and Damage*

Pecan scab disease is the most economically damaging disease of pecans production in the southeastern United States. It is often the cause of lower production and profit in commercial orchards. The disease affects stem, leaf and nut growth, causing reduced yield. The cost of disease control reduces the profitability of growing pecans. Pecan scab also is one of many factors that prevent yard trees and small, unmanaged plantings from producing high quality nuts.

## *Disease Development and Symptoms*

Pecan scab disease is caused by the fungal pathogen *Fusicladium effusum*. The pathogen can infect actively growing tissue including stems, leaves and nut shucks (Figures 1 & 2). Rapidly growing stems can be infected in early spring. Leaves can be infected from bud break until they are fully expanded, usually in June. Nuts are susceptible from the time they are formed until they have ceased growth in late summer. Nuts are especially susceptible to infection during the period of rapid enlargement, usually from late June through July.

Infections are started by spores of the fungus. Lesions left from the previous year's infections begin to produce spores as the weather warms in early spring. These old lesions as well as new infections can continue to produce spores throughout the summer, compounding the level of infection that results in dramatic increases in the amount of disease.

Following infection, visible lesions develop in seven to 14 days. Lesions are generally circular, range in size from pinpoint to about one-quarter inch in diameter. They are light brown to black (Figures 1 & 2). On leaves, lesions are often most numerous along the veins, but they can occur on any part of the leaf. Numerous lesions can combine to form larger dead areas on any infected tissue. Severe infection can kill current season stem growth. Leaf lesions reduce the photosynthetic potential of the foliage and cause early leaf loss. Lesions produced by early spring infections will produce spores that can infect the nuts during the summer.

Lesions on nuts become sunken and often hardened and crack as they age. Severely infected nuts can be distorted and may stop growing. These may drop prematurely or remain attached to the tree throughout the season. Less severe infections and infections that occur later in the season reduce the growth of the nuts and lower yields. Depending on the stage of nut development and severity of infection (Figure 2), damage can range from total nut loss to little yield loss.

## *Factors that Influence Disease*

The severity of pecan scab disease depends, to a large extent, on weather. Moisture, generally from rainfall, is needed for spore germination and infection. Several hours of wetness are needed for infections to become established. The frequency of rainfall and length of time tissue remains wet are more important in creating infection periods than is the total amount of rainfall. Late afternoon rains that cause trees to remain wet overnight provide prime conditions for development of scab disease. The amount of time it takes for an infection to occur is influenced by temperature, but temperatures are normally adequate for infection during the spring and summer months. Factors that tend to maintain high humidity conditions in an orchard also contribute to infection periods. These include close tree spacing, low limbs and tall, dense ground vegetation.

Pecan cultivar (cultivated variety) susceptibility to the pathogen also plays a major role in disease development. Levels of susceptibility can extend from very susceptible to seldom being infected. The pathogen frequently adapts to the genetics of a cultivar, however, and resistance can be lost over time. Many cultivars that were originally regarded as resistant to scab disease (ca. Schley and Desirable) are now considered quite susceptible because the pathogen has adapted to the cultivar.

## Control

The primary method of scab disease control preventive applications of fungicides. For prevention of disease, apply fungicide before an infection period. Once an infection is established, fungicides do little to stop disease development. Because there is susceptible tissue in the orchard throughout the growing season, it is generally necessary to apply fungicide several times during each season to obtain efficient control. The number of fungicide applications needed for disease prevention depends on weather, amount and virulence of the pathogen spores, and susceptibility of the cultivars. Generally fungicides need to be applied every two to four weeks from spring through summer.

Apply fungicides at a concentration sufficient to prevent infection and completely cover the trees. To apply the proper concentration, use the amounts advised by the manufacturer on the product label. The best coverage is obtained with ground equipment designed to spray large trees. Almost all cultivars will need to have some fungicide protection, but those with more resistance will need to be sprayed less often.

In noncommercial pecan plantings such as small orchards and yard trees, it is usually not feasible to apply fungicides because of the cost of equipment and chemicals. In these instances it may be possible to reduce the level of scab disease by the use of sanitation. Sanitation involves removing old leaf and nut debris from the ground or plowing the debris under. Shucks remaining in the tree at the end of a year should be removed and infected stems pruned away. When choosing trees for yard planting, it is best to use cultivars that are rated as resistant to scab disease. There is no guarantee, however, that the resistance will be maintained because the pathogen historically has overcome pecan tree resistance. The names of pecan cultivars recommended for commercial and home planting can be obtained from the LSU AgCenter Extension office in each parish. Recommendations for control of disease and insect problems of pecan also are available from these offices.



Figure 1



Figure 2

R.S. Sanderlin, Associate Professor (Plant Pathology)  
J.R. Pyzner, Associate Specialist (Horticulture)

**Louisiana State University Agricultural Center**, William B. Richardson, Chancellor  
**Louisiana Cooperative Extension Service**, Jack L. Bagent, Vice Chancellor and Director  
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