Greasy Spot of Citrus

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Cause and Symptoms

Greasy spot is a major foliar and fruit disease on citrus in Florida. It causes premature leaf drop beginning in the fall and continues through winter and spring. As a result, yields of the following crop are reduced. Furthermore, cold damage has been observed to be more severe on severely defoliated trees. Rind blemish from this disease causes downgrading of fruit intended for the fresh fruit market and this can be particularly severe on grapefruit.

Greasy spot is caused by the fungus, *Mycosphaerella citri*. Infection of leaves and fruit occurs primarily in June, July and August by spores that originate on previously infected, fallen, decomposed citrus leaves. Only after successive wetting and drying of the fallen citrus leaf litter will the spores be formed and released. Spores are most abundant during the earlier part of the summer's rainy season. As the rainy season progresses, the number of available spores decreases because of further leaf decomposition and an insufficiency of further leaf drop during the summer to replenish the supply. Only spores that land on the undersurface of citrus leaves are capable of causing infection, as the infection sites (the stomates) are confined to the underside of the leaf. After landing on the leaf, provided that there is free water on the leaf or the relative humidity is near 100%, the spores germinate. The resulting germ tubes are capable of infecting the leaf or fruit rind immediately. However, a more significant feature with this fungus behavior is that under conditions of high moisture combined with high temperature the germ tubes can continue their growth and form a microscopic branching mycelial growth on the leaf surface. This increases the chances for infection.

Only if a high density of penetrations occur will symptoms eventually develop. The superficial growth increases the chances of this occurring. The incubation period (infection to symptom expression) can be as little as 4 to 6 weeks on lemon leaves but it usually exceeds four months on leaves of orange and grapefruit.

Leaf symptoms begin as slight blisters on the underside of the leaf (Figure 1, leaf on left) with a yellow mottle at that point on the upper-side of the leaf (Figure 2, leaf on left). In time, the blistered areas become dark orange to brown to black and have a greasy appearance, (Figures 1 and 2). On fruit, pinpoint black specks occur between the oil glands and delayed coloring of the rind often occurs at those points (Figures 3 and 4). On grapefruit this same disease is referred to as "pink pitting" (Figure 5).

Control

Greasy spot is controlled effectively with copper fungicides or oil provided spray timing is correct and the placement of the material is on the underside of the leaf. A single application should be made in June or July. Because of the superficial growth of the fungus on the surface of the leaf and the long period of time (2-3 weeks) for deep penetration by the fungus into the leaf, the single application not only protects the leaf from future infections but also kills the superficial fungus growth already present. It is therefore unnecessary to apply the spray before the first spores are likely to reach the leaf as is the case with most other fungal diseases. Where greasy spot has been severe in a grove, an additional application should be made in August! Where fruit is intended for the fresh market, oil is not effective in reducing symptoms in fruit. Also, when copper is applied late it can cause blackening of windscar and other existing corky tissue. A detailed spray program is available in the Florida Citrus Spray Guide (Circular SP-43).

Figure 1. Early and late symptoms of greasy spot on underside of leaves.

Figure 2. Early and late symptoms of greasy spot on upperside of leaves.

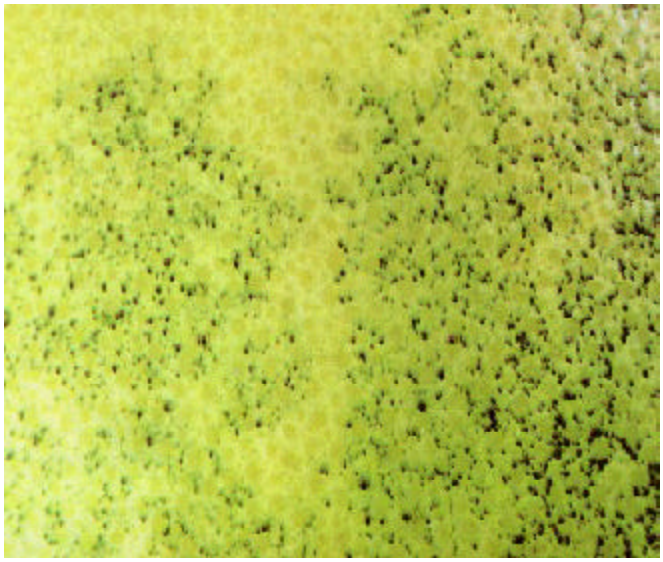

Figure 3. Close up of infected grapefruit rind showing delayed coloring between oil glands

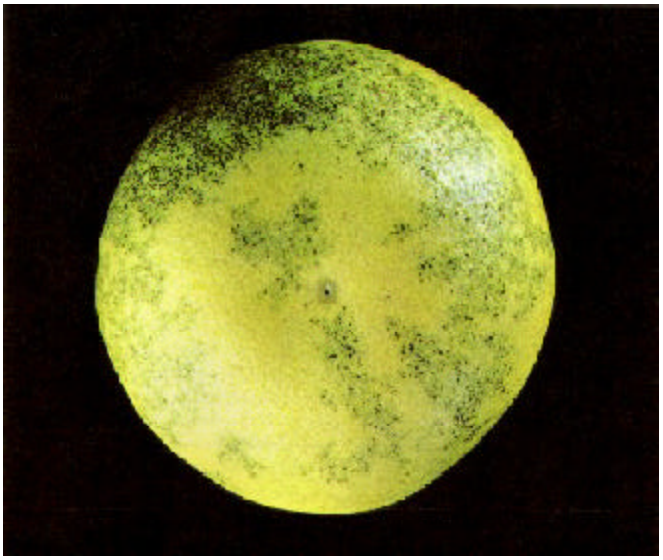

Figure 4. Delayed coloring between oil glands on grapefruit

Figure 5. Late symptoms on grapefruit rind-pink pitting.