CITRUS SCAB

Conidial state: *Sphaceloma fawcettii* Jenkins. Teleomorph: *Elsinoë fawcettii* Bitancourt & Jenkins.

1 PATHOLOGICAL PROFILE

1.1 Distribution and status

Scab distribution is limited to all the coastal and adjacent areas of southern Africa where suitable rainfall conditions occur during spring. Cultivars reported to be susceptible include sour orange, rough and sweet lemon, grapefruit, tangerine, mandarin and trifoliate.

1.2 Description

Leaf lesions are amphigenous, initially semi-translucent dots, becoming papillate, cream to pale yellow or variously coloured, up to 3 mm in diameter. Scabs are regularly discoid to subglobose, confluent, mostly along the main veins, cinnamon to honey coloured, warty, deeply cracked and split when old, up to 1 mm in diameter. Fruit and young shoots may develop similar symptoms. Ascomata are scattered, pulvinate, circular to elliptical, dark brown, up to 120 µm wide, composed of pseudo-parenchymatous tissue containing several locules with asci. Asci are subglobose to elliptical, thick walled at the top, 8 spored, 12 to 16 µm in diameter. Ascospores are hyaline, oblong elliptical, 1-3 septate, usually constricted at the central septum, 10 to12 x 5 to 6 µm. Acervuli are epidermal to subepidermal. They are separate or confluent, composed of hyaline to pale brown pseudoparenchyma and 12 to 22 x 3 to 4 µm. Conidia are hyaline, one celled, ellipsoidal, 5 to10 x 2 to 5 µm. Scab pustules consist of a stroma, which contains mycelia of the pathogen plus dead host cells, and hyperplastic host cells which contain few or no chloroplasts (CMI Descriptions of Pathogenic Fungi and Bacteria, No. 438).

1.3 Symptoms

1.3.1 Leaves

Leaves are more susceptible to infection just as they emerge from the bud, and they become immune before reaching full size. Infection of actively emerging shoot apices of highly susceptible cultivars develops a protuberance on the invaded side of the leaf with a corresponding depression on the opposite side. When leaves approach maturity, the scab pustules are smaller and little or no leaf distortion occurs. At times lesions on the leaves may coalesce and cover large areas to form corky spots (Fig. 1).

1.3.2 Fruit

Infection of young fruit promotes the formation of relatively large volumes of hyperplastic tissue, in conidial or warty outgrowths on the rind. These outgrowths are particularly large on lemons, sour orange and mandarins soon after petal fall. On grapefruit and sweet orange rind, the pustules tend to be less raised. With infection on more mature fruit, the rind on all cultivars responds by producing pustules raised only slightly above the normal contour of the fruit surface. If heavily infected, these pustules can coalesce to form extensive scabby areas which may crack into platelets as the fruit expands. The scurfy type of scab symptom may be confused with wind scar. However, in scab infections, some discrete round pustules are present on the periphery of the confluent scurfy area. Within this area, the periphery of the affected area may also contain some minute islands of scar tissue. Where a leaf was in contact with the surface of the fruit causing wind scarring, the leaf tends to hold a film of water between itself and the rind surface and thus aids scab infection. Fruit remain susceptible to infection for about 3 months after petal fall (Fig. 2).

1.3.3 Twigs

Scab lesions on twigs start as small translucent spots that become raised, occurring singly or in groups. With age the lesions become dark olive, drab, a change due to the growth of saprophytic fungi on the scab surfaces. Twigs may be killed, especially on sour orange and rough lemon seedlings in the nursery (Fig. 3).

1.4 Transmission

Scab overwinters on the tree canopy. Its survival depends on the ability of existing scab pustules to retain their inoculum producing capability until new susceptible young shoots or

fruit appear. Then the spindle-shaped conidia, which are splash-dispersed and perish as soon as they dry, can be dispersed by wind and remain viable for a short time. Although little infection seems to result from these wind-dispersed conidia, they could be significant in long-distance dissemination.

1.5 Seasonal occurrences

Symptoms occur on leaves as they emerge from the bud. Leaves become immune before reaching full size. Fruit remain susceptible to infection for about three months after petal fall.

2 MANAGEMENT ASPECTS

2.1 Disease assessment

In areas where the disease occurs annually, a preventive approach should be adopted. Treatments should commence as soon as the first spring flush emerges.

In areas where the disease occurs infrequently, or has not yet occurred, young vegetative flush and fruit should be inspected after rainy periods for the presence of lesions.

2.2.1 Plant Protection Products

All sprays must be applied at medium cover spray intensity, ensuring that all fruit surfaces and leaves are thoroughly wetted. For more details on spraying requirements consult the part on the application of plant protection products in Chapter 2 of this volume.

Spray programme for citrus scab

Growth stage	Product	Dosage/100 ℓ water
After blossom	Copper oxychloride	200 g
Mid-end October	Benlate + Mancozeb + mineral oil	25 g + 150 g + 250 ml
Mid-December	Benlate + Mancozeb + mineral oil	25 g + 150 g + 250 ml
Mid-January	Mancozeb	200 g

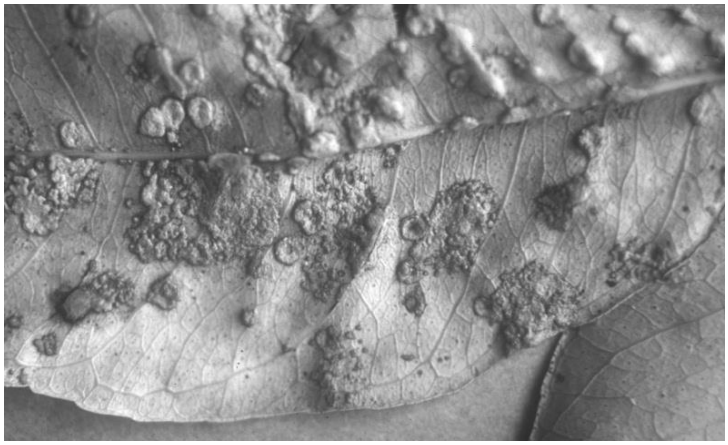

Figure 1. Scab lesions sometimes coalesce to form corky spots on citrus leaves.

Figure 2. Raised pustules of citrus scab on leaves and fruit of rough lemon.

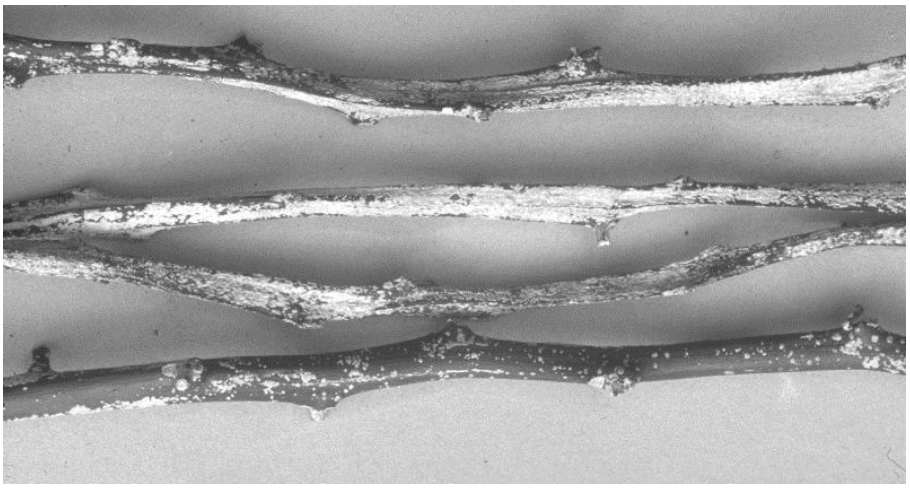

Figure 3. Lesions caused by scab on twigs of rough lemon. Severe cases may cause die-back.