

Citrus Black Spot

Summary

Citrus Black Spot is a fungal disease that causes early fruit drop, reduces yield and makes the fruit unfit for fresh market. Spores produced on foliage are the main inoculum source, and the movement of sick plants or foliage the means of dispersion.

The disease occurs in subtropical regions worldwide. In the US, Citrus Black Spot is only present in South Florida, where it was detected in 2010.

Symptoms

Black spot affects citrus foliage and fruits. There are several fruit symptoms that may overlap. Typical symptoms consist of hard spots that begin as small orange or red lesions with black margins and enlarge to become necrotic lesions. These blemishes

of the rind (black spots, Fig. 1 & 2) make the fruits unfit for fresh market. Early virulent spots may coalesce to cover a large portion of the fruit. Other symptoms include speckled blotch or false melanose where the fruit is covered by tiny spots in absence of any other symptom. Severe disease causes extensive premature fruit drop.



Figure 1: Typical black spots on Valencia orange, top left, and Ellendale mandarin, top right. Details of the lesions with pycnidia, in Nova mandarin (bottom, left & right) and in orange (bottom, center). Photos: Myrian Rybak.



Figure 2: Hard spots on mature and green mandarin fruits. Photos: Myrian Rybak.

Causal agent

Black spot is caused by *Guignardia citricarpa* (asexual stage *Phyllosticta citricarpa*). Spores of the sexual stage, ascospores, develop on dead leaves (Fig. 3). Conidia-containing Pycnidia (asexual stage, Fig. 4) develop in the center of fruit lesions, and can be seen as small black dots (Fig. 1). The disease is widespread to most humid subtropical regions of the world.

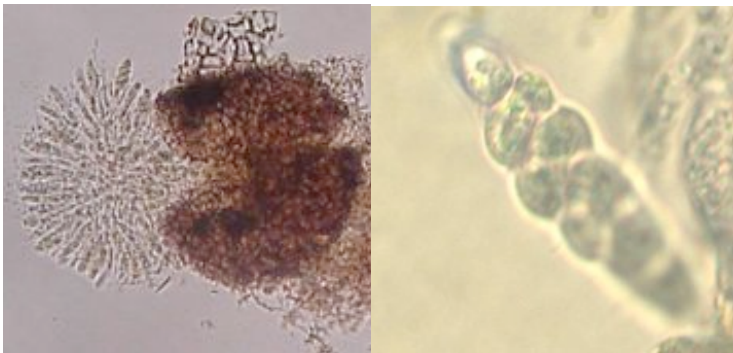


Figure 3. Sexual stage fruiting body (left) and asci with ascospores (right). Photos: Myrian Rybak.

Inoculum source and conditions

Ascospores are carried from dead leaves into air currents. Conidia (Fig. 4) from fruit lesions are disseminated by rain. Conidia and ascospores (Fig. 3) are responsible for the local spread of the disease. Long distance dispersion occurs via infected nursery stock. Under favorable conditions spores germinate and infect young tissues. Although infection takes place in young tissues, lesions will not develop completely until fruits mature (Fig. 1 & 2).

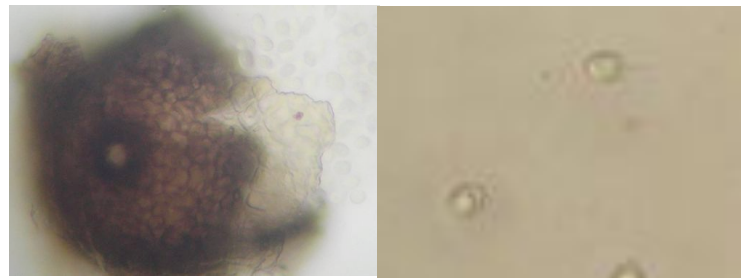


Figure 4. Pycnidia (left) and its conidia (right). Photos: Myrian Rybak.

Management

- Removal of dead leaves in groves to reduce the primary inoculum.
- Application of fungicides. Programs with three applications of Copper plus oil offer good protection. First application at 2-3 cm fruit diameter, second one month later (at 3-4 cm fruit diameter) and a third in another month (at 4-5 cm fruit diameter). In Argentina, a post infection application with Benomyl, Carbendazin or Thiophanate methyl, together with a second application at 4-5 cm fruit has resulted in good disease control. In Florida, protective treatments using either Copper, Strobilurin fungicides, Mancozeb, Carbendazim or Thiophanate methyl are recommended.

References

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