



CERCOSPORA LEAF MOULD

**also called Cercospora Leaf Spot,
Cercosporiosis or Cercosporiose**

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This is No. 9 in a series of 9 tutorials on IPDM in olives

The others are:

1. Principles and practices of Integrated Pest and Disease Management
2. Monitoring for pests, diseases and beneficial species; including symptoms and possible causes, identification/diagnostic services
3. Biosecurity, including pests and diseases not present in Australia
4. Black scale: biology, damage and management
5. Olive lace bug: biology, damage and management
6. Apple weevil: biology, damage and management
7. Anthracnose: life cycle, conditions conducive, symptomatology and damage, and management
8. Peacock spot: life cycle, conditions conducive, symptomatology and damage, and management

It is an output from the Hort Innovation project OL17001 An Integrated Pest and Disease Management Extension program for the Olive Industry



CAUSE AND IMPORTANCE

- It is caused by the fungus *Pseudocercospora cladosporioides*
- It is very common in Australian olive groves but rarely causes significant losses, particularly if tree health is maintained by optimising nutrition and irrigation
- It is a slow degenerative disease often taking several years for trees to significantly decline
- It can cause delayed fruit ripening and decreased oil yield



CERCOSPORA LEAF MOULD SYMPTOMS

- Leaves turn yellow and may have dead brown areas – mostly in the inner or lower parts of the canopy
- Infected leaves may drop
- A diffuse lead-grey mould develops on the leaf under-surface – mostly visible on young leaves
- It can rarely cause a fruit infection – small (<5mm) sunken grey-brown spots – although in some varieties spots may be larger, darker and not sunken



CERCOSPORA LEAF MOULD SYMPTOMS

Yellow infected leaves are easily dislodged when touched

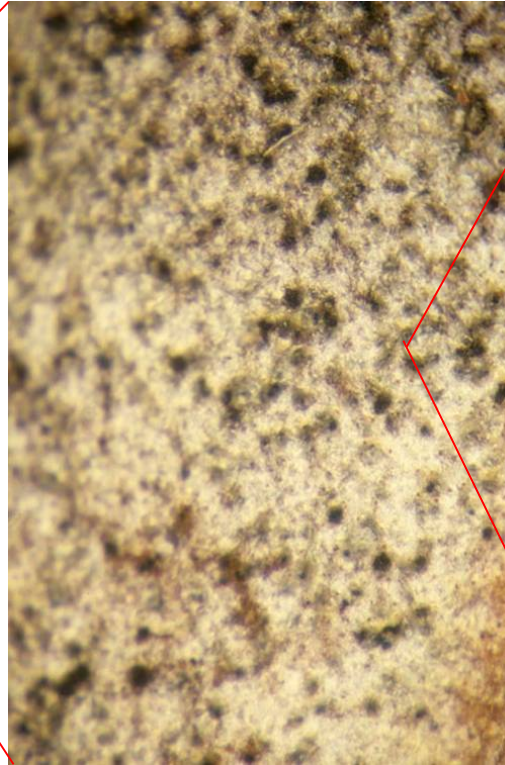


CERCOSPORA LEAF MOULD SYMPTOMS

Pseudocercospora cladosporioides



Lead-grey fungal growth
on leaf under-surface



X10 mag.

Clumps of fungal growth
emerge from stomata & epidermis



X1000 mag.

Long thin fungal spores
disperse with water

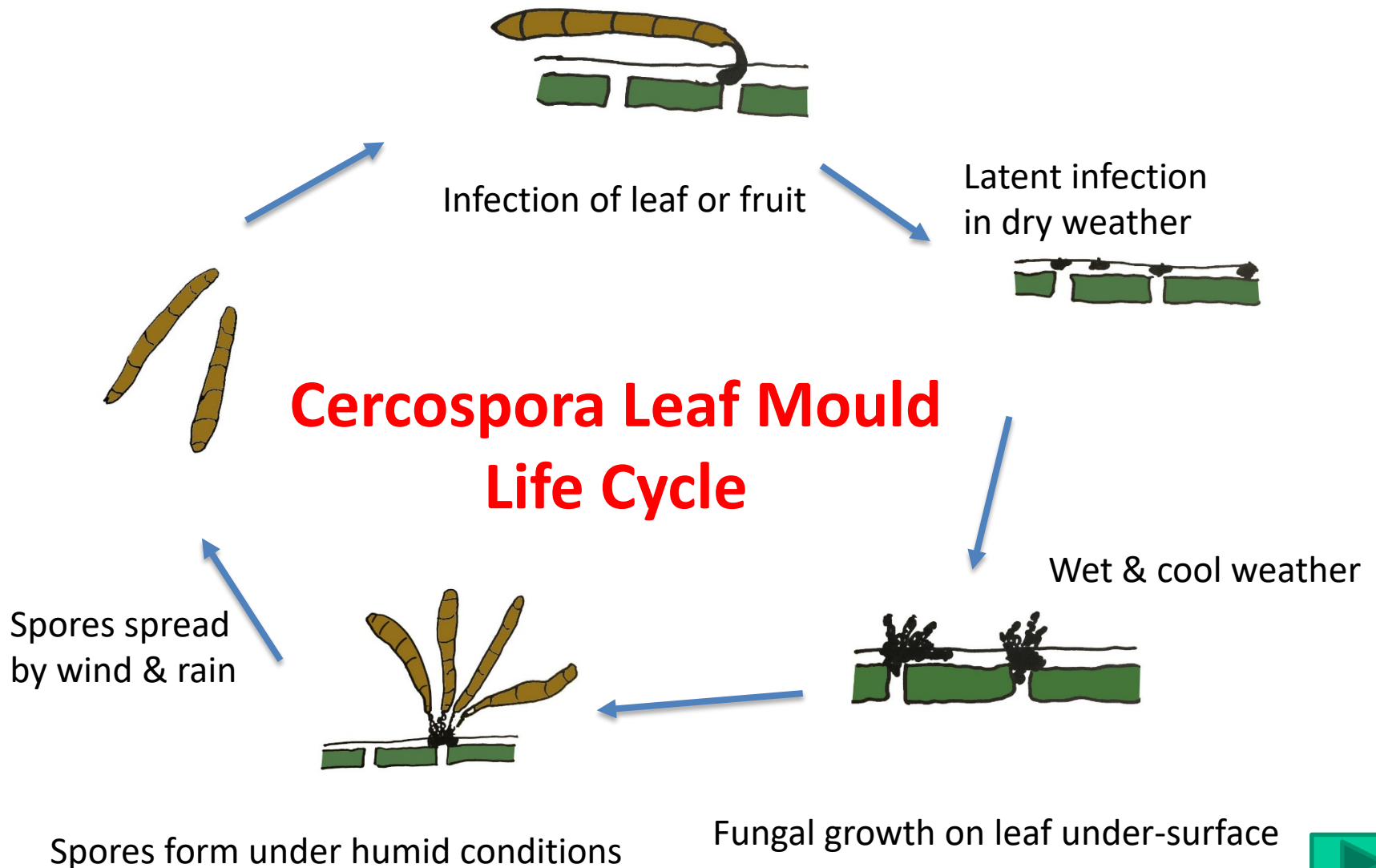


BIOLOGY & LIFE CYCLE

- This disease is not well studied globally so we are uncertain about the exact life cycle
- Initial infections occur during late winter with rainy weather – younger leaves are most susceptible
- The optimum temperature for spores to germinate is between 15-25°C (average 22°C)
- There can be a long latent period before symptoms develop – up to 11 months! – it depends on the weather – a wet spring favours disease development
- Rainy weather in late summer and throughout autumn favours spore formation and further spread to leaves and fruit



LIFE CYCLE OF *Pseudocercospora cladosporioides*



MANAGEMENT OPTIONS

- Remove or cover dropped leaves with compost
- Prune branches to open up the canopy to air/sun
- Fungicide applications – timing important - winter & spring - & when rain expected in late summer
- Recent research in Europe – *Bacillus subtilis* was effective (various strains of this and similar bacteria were sprayed on trees at regular intervals through the year)
- Some olive varieties are more tolerant – e.g. *Arbequina* and *Picual*
- Some olive varieties are very susceptible – e.g. *Hojiblanca*



REVISION QUESTIONS

- Q1: What are two typical symptoms of Cercospora Leaf Mould?
- Q2: In what ways is this disease similar to Peacock spot?



ANSWERS

- Q1: Yellow leaves which are easy to dislodge when touched; and diffuse lead-grey mould on the leaf under-surface
- Q2: Spore formation, spread and infection occur during periods of wet weather; infections can remain latent under dry conditions; and many infected leaves drop to the ground becoming a source of fungal inoculum for the next season



QUESTIONS TO CONSIDER AFTER READING THIS TUTORIAL

- Do you have Cercospora leaf mould in your grove (some growers don't know until they closely check) and is it increasing from year to year? In other words, is it becoming a problem?
- If you are taking strategies to manage it, what are they?
- How effective have your strategies been, and are there additional or alternative strategies you could employ?



FURTHER READING

- Avilla A, Romero J, Agusti-Brisach C, Benali A, Roca L & Trapero A (2020) Phenotypic and pathogenic characterisation of *Pseudocercospora cladosporioides*, causal agent of cercospora leaf spot of olives. *European Journal of Plant Pathology* 156:45-65.
- Nigro E, Antelmi I & Sion V (2018) Integrated control of aerial fungal diseases of olive. *Acta Horticulturae*. 1199.51 ISHS. Eds: S. Perica et al. 327-332.



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