

Olive Disease Management Fact Sheet

Anthracnose

Anthracnose is a major disease of olive fruit in New Zealand. It is considered the most important fungal disease of olive fruit world-wide.

Description of the Pathogen

The fungus that causes this disease forms unicellular, hyaline, elliptical conidia arising from small blister-like acervuli which can be visible on the fruit. The conidia can remain viable for a year inside mummified fruit which may be the primary inoculum source. Dissemination is by leaf wetness and water splash (heavy dew or rain) which facilitates the separation of the conidia from their fruiting body. The conidia always need free water to germinate. ^[1]

Infection can take place between 5 and 30 degrees C. The conidia persist and sporulate in mummified fruit.



<https://www.australianolives.com.au/assets/files/pdfs/aoa-forms/Members%20Lounge/Anthracnose-in-olives-symptoms-disease-cycle-and-management.pdf> ^[2]

<http://olivediseases.com/media/Olive-diseases-in-Australia-Power-point-presentaion-copy2.pdf> ^[3]

Symptoms of Fruit Infection

Normally infection starts at the tip of the fruit where free water accumulates. As the disease progresses all or part of the infected fruit starts to rot. In favourable conditions (warm and wet) a large number of acervuli develop on the skin of the olive and a slimy redish substance that contains conidia is formed inside. This colouring is what leads to the common name of “soapy olive” in Spanish. Infection on branches and shoots have been recorded in some areas with ensuing defoliation and die-back of the tree. ^[1]



Tree Health

Infection of Anthracnose can over-winter on mummified fruit. Infection of the olive flower can be observed as a browning of petals and stalks that become desiccated then dry and falls off. When conditions are ideal this infection moves from the flowers into the branches and leaves. Trees infected by anthracnose can also show chlorosis (which is a yellowing of the leaf) followed by defoliation and dieback of twigs and branches.

The severity of the infection increases with the duration of the wet period. Field trials show that anthracnose epidemics progress faster in super high density planting (1900 trees per ha) than in conventional densities of 200-800 trees per hectare. ^[4]

Management Strategy

Anthracnose infection occurs at two critical times. First, during the flowering period and the second period beginning as fruit begin to ripen for harvest. In arid locations one to two fungicide applications prior to flowering, followed by one to two applications at the beginning of fruit ripening provide adequate control.

In New Zealand's maritime climate with irregular but frequent rainfall throughout the 12 month period we are recommending a spray programme of Mancozeb at a rate of 3kg per ha on a regular 20 day cycle, or after 20mm of rainfall, or any combination of days and rainfall that equal 20. This programme will be effective if applied with the understanding that application must be pre-emptive of wet events.

It is important to recognise that a preventative spray programme utilises the cheapest available protective fungicide. It is only protective if it is applied to achieve whole leaf surface coverage, both upper and lower surfaces, prior to an infection event.

Anthracnose in olive flowers and shoots:



Literature Cited:

[1] Olive Pest and Disease Management, Manuel Civantos Lopez-Villalta, IOOC

[2] Dr Vera Sergeeva, University of Western Sydney, Centre for Plant & Food Science

[3] Dr Vera Sergeeva, www.olivediseases.com

[4] Effect of Temperature, Wetness Duration and Planting Density on Olive Anthracnose Caused by *Colletotrichum* spp. Juan Moral, Jose Jurado-Bello, M. Isable Sanchez, Rodrigues de Oliveira and Antonio Trapero

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Cercospora

Cercospora is a major leaf disease of olives and in New Zealand is a serious defoliating disease.

Description of the Pathogen

The fungus that forms this disease is *Cercospora cladosporioides*. The conidia are narrow and elongated and have a variable number of septa. In arid conditions infection occurs principally in autumn. Conidia are spread from leaf to leaf by free water (dew and rainfall) splash and preferentially infects young leaves. Spores are produced at temperatures between 12 and 28 degrees. ^[1]

In arid climates Autumn is the wet season. In New Zealand we have no specific wet season and infection can occur at any time throughout the year. The vector for spread of Cercospora spores is leaf wetness (dew and rainfall).

<http://olivediseases.com/media/Olive-diseases-in-Australia-Power-point-presentaion-copy2.pdf> ^[2]

Symptoms of Fruit Infection

The symptoms of Cercospora on fruit are small necrotic indentations into the surface.



Tree Health

Initially infected leaves do not look different to healthy leaves. Careful scrutiny reveals grey colouring on the underside of the leaf. The leaf then turns yellow and eventually falls off. Lead grey irregularly spaced spots can be seen on the lower surface of yellow infested leaves. ^[1]

The main damage caused by Cercospora is heavy defoliation caused by premature shedding of infected leaves. Often heavy infection of Cercospora occurs coincidentally with heavy infection of Peacock Spot. This combination results in poor crop production.



Management Strategies

Cercospora infection occurs at any time during the year. In arid locations one application of fungicide in spring, followed by one application in late summer provides adequate control.

In New Zealand's maritime climate with irregular but frequent rainfall throughout the 12 month period we are recommending a spray programme of Mancozeb at a rate of 3kg per ha on a regular 20 day cycle, or after 20mm of rainfall, or any combination of days and rainfall that equal 20. This programme will be effective if applied with the understanding that application must be pre-emptive of wet events.

It is important to recognise that a preventative spray programme utilises the cheapest available protective fungicide. It is only protective if it is applied to achieve whole leaf surface coverage, both upper and lower surfaces, prior to an infection event.

Literature Cited:

[1] Olive Pest and Disease Management, Manuel Civantos Lopez-Villalta, IOOC

[2] Dr Vera Sergeeva, www.olivediseases.com

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Peacock Spot

Peacock Spot is a major disease of olives in New Zealand. It is found in all olive growing regions of the world and in New Zealand is a serious defoliating fungus disease.

Description of the Pathogen

The fungus that causes this disease is *Spillocaea oleagina*. It is a phycomycete that develops and forms colonies under the upper cuticle of the leaf. The mycelium grows moving towards the surface of the lesions which take on the typical concentric ring shape hence the name peacock spot. The biology of this fungi varies considerably from one region to another and from one year to the next as its development depends on a series of factors – humidity, temperature, leaf wetness (dew or rainfall) and cultural practice (pruning). Germination can occur between 0 and 28 °C. The average time needed for germination decreases as the temperature rises. Spores are viable for some months. They are spread almost exclusively by rain which is why successive infections occur in short time spans. The time elapsed between infection and the appearance of symptoms varies between 2 and 15 weeks depending on temperature, moisture and the age of the leaf. ^[1]

<http://olivediseases.com/media/Olive-diseases-in-Australia-Power-point-presentaion-copy2.pdf> ^[2]

Symptoms of Fruit Infection

The symptoms of Peacock Spot on fruit are small grey spots dotted irregularly on the surface.



Tree Health

This disease produces lesions on the upper leaf surface and occasionally on the leaf stalk, stem and fruit. Spots can be seen on the leaf surface in concentric circles varying in colour from brown to yellow, and green to black. ^[1]

Not all infected leaves fall from the tree and the disease survives on those leaves remaining on the tree. Infected leaves turn yellow (chlorosis) and prematurely fall from the tree. When significant defoliation occurs flowers fail to develop and/or small branches die. High temperatures (above 28 °C) restrict spore germination as do dry periods. ^[3]



Management Strategy

High relative humidity and free water on the leaf play an important part in the development of this disease. It is advised to apply cultural practice that provides well aerated trees. This can be achieved firstly with contoured planting to encourage air drainage through the grove followed by selective pruning to avoid dense canopy. ^[1]

In arid locations one to two fungicide applications in spring, followed by one to two applications post harvest provides adequate control. In New Zealand's maritime climate with irregular but frequent rainfall throughout the 12 month period we are recommending a spray programme of Mancozeb at a rate of 3kg per ha on a regular 20 day cycle, or after 20mm of rainfall, or any combination of days and rainfall that equal 20. This programme will be effective if applied with the understanding that application must be pre-emptive of wet events.

It is important to recognise that a preventative spray programme utilises the cheapest available protective fungicide. It is only protective if it is applied to achieve whole leaf surface coverage, both upper and lower surfaces, prior to an infection event.

Premature defoliation after Peacock Spot leaf infection:



Literature Cited:

[1] Olive Pest and Disease Management, Manuel Civantos Lopez-Villalta, IOOC

[2] Dr Vera Sergeeva, www.olivediseases.com

[3] UCIPMZ Pest Management Guidelines; Olive UC ANR Publication 3452

Summary of New Zealand Focus Groves

March 2017

Terrace Edge Grove, Bruce & Jill Chapman, Amberley.

These trees are the smallest canopy volume trees of any of the focus groves being lower in height and somewhat windswept from the north-west. Most of these trees don't exceed 3.5m in height. Recommended pruning to date has been to undertake one to two significant pruning cuts to open the canopy to access sunlight to the internal part of the tree to begin rejuvenating the canopy. The consequence of this will be better access for spray penetration and a reduction in wind from the prevailing nor-wester. Overall the leaf disease level in the canopy is low, the dry climate of the Canterbury assisted in combination with a fungicide programme.

Kakariki Olives, John & Helen Dunlop, Nelson.

This grove is grown on clay soil. It is the highest rainfall region for a focus grove. These trees are the tallest of any of the focus groves and the soil type retains moisture for the longest period. To maintain lower levels of disease infection the most intensive spray programme of the focus groves is necessary. The canopy health looks good but requires constant canopy help and a willingness to spray as the weather requires. Pruning at Kakariki is firstly driven by the need to reduce tree height. Some trees are reaching 6 and 7 m in height which is having a shade effect to adjacent rows and the height is out of the capability of the spray machinery to apply chemical adequately. The pruning strategy of reducing one high limb per year is resulting in rejuvenation of the trees lower down and looks positive at this stage.

Leafyridge, Craig & Ruth Leafwright, Wairarapa.

An east coast grove with good drainage in dryer conditions. The pruning strategy that has been undertaken is removal of one to two limbs to open a portion of the canopy to begin a rejuvenation cycle and provide better drying conditions and a reduction in wind damage. Leaf disease level is low. Some evidence of yellowing leaves through the grove appear to be compounded from the severe drought of 2015/16. A large crop was harvested in 2015/16 and the return crop of 2016/17 is looking promising.

Aquiferra, Bob Marshall & Shona Thompson, Hawkes Bay.

This grove has been sprayed regularly and shows a very low level of leaf disease. At the last field day the pruning undertaken in spring of the 2016/17 season was discussed and considered to have been a heavy prune. Following the field day three rows were pruned in a lighter manner as a direct comparison. January 2017 the well has run dry and it will be interesting to observe prior to harvest the benefit or not of a heavy prune in a dry year.

Olives on the Hill, Chris & Linda Smith, Mangawhai.

This is a sub-tropical location with very regular rainfall requiring very regular spraying to keep the leaf disease at an acceptable level. As with the Nelson grove the contour of the grove can make spraying on hills in wet conditions a challenge. Leaf canopy disease level has improved with regular spraying. The pruning regime has involved an additional one or two large cuts in an attempt to reduce height and these trees are at the maximum of the tree-row volume of this spacing. In addition to the canopy management and disease management on the focus grove there has been the interest in the coppiced Leccino block and the grafting undertaken nearby.

Overall:

At the last round of field days prior to and during flowering discussion was had regarding the effect of anthracnose to flowering. This will again be an interesting topic at the next field day as fruit load will provide evidence of any incidence.

The cultural practice of pruning removal of several large limbs to open the canopy, reduces height and volume of the tree, increases sunlight access inside the tree, combined with improving wind access to encourage drying of the canopy post rain. It also consequentially provides better access for spray penetration.