

Onion leaf and stem diseases

Downy Mildew

(caused by *Peronospora destructor*)



Image courtesy of Seminis

SYMPTOMS: Typically starts as brownish-purple velvet-like sporulation on healthy green leaves. Lesions slightly paler than normal leaf colour, enlarge and may girdle the leaf. Lesions progress to a pale yellow followed by brown necrosis resulting in leaf tissue collapse. In an affected crop that does not receive a preventive program and is not monitored regularly, circular areas of yellowed plants alert to the disease. As the disease progresses unchecked, the yellowing patterns often enlarge in the direction of prevailing winds.

PATHOGEN SOURCE: Volunteer onion plants from previous crops, infected debris. Airborne spores.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE DEVELOPMENT: For infection and sporulation, the pathogen requires temperatures less than 23°C (optimum 10-12°C) and the presence of free water on the leaf surface or relative humidity above 95 per cent between approximately 2am

and 7am with little to no rain in that period for spore production. There is a 9-16 day latent period between infection and spore production. A few hours of sunny, dry weather can dramatically impede disease progress.

CONTROL: Clean seeds, sets and bulbs. Rotate onions to have at least four years between crops to prevent disease build up. Water early in the day so onion foliage is dry by afternoon. Remove volunteers and discard plant debris. Use a preventive fungicide program. If required, use a systemic fungicide at the very first sign of infection when light-coloured spots can be seen on leaves. To find them, it is important to scout the crop systematically and especially look at areas that may have longer periods of leaf wetness. Do not overuse systemic fungicides to avoid resistance development. Spraying systemic fungicides when the fungus is already highly active and sporulating increases the risk of resistance developing.

Botrytis Leaf Blight

(caused by *Botrytis squamosa*)*



Image by Lindsey du Toit, Washington State University, Bugwood.org.

SYMPTOMS: Primarily attacks leaves appearing as small white spots surrounded by a greenish halo. The first symptom of the disease occurs in the leaves 24-48 hours after initial exposure to the pathogen. Centres of spots often turn tan; lesions expand with age. Complete blighting can be seen about 12 days after initial infection. Symptoms towards the later stages also include leaf tip dieback and necrosis. These necrotic spots are the sites of secondary conidial production. Bulbs from infected plants may be small because growth is reduced by leaf loss. Sclerotia are produced in the leaves and necks of infected bulbs (blackened appearance) that overwinter and germinate the following spring. Sclerotia can survive up to 21 months at a depth greater than 15cm from the soil surface.

PATHOGEN SOURCE: Caused by the fungal pathogen *Botrytis squamosa*. Airborne spores.

Botrytis can be carried in and on onion seed. The seed infection rate drops during seed storage.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE DEVELOPMENT: In the presence of moisture, the *Botrytis squamosa* spores germinate and produce enzymes that kill leaf tissue.

Leaf surfaces must be wet from dew or rain for 20 or more hours for leaf spots to develop. Optimal temperature for spore germination is 15°C. Poor air circulation in the onion canopy also favours the disease.

CONTROL: Destroy onion or debris cull piles; a preventative fungicide spray program is important. High nitrogen fertiliser input may lead to greater canopies and therefore susceptibility to the disease.

* *Botrytis squamosa* is an exotic disease referenced in the *Onion Growers' Biosecurity Manual*. Be alert and if you see anything unusual call the Exotic Plant Pest Hotline on 1800 084 881.

Stemphylium Leaf Blight

(caused by *Stemphylium vesicarium*)



Image courtesy of Seminis

SYMPTOMS: Small, light yellow to brown, and water-soaked initial infections on leaves and leaf sheaths. Lesions expand, causing extensive blighting of leaves. Lesion centres turn brown to tan, then dark olive brown and finally black. Symptoms are very similar to Purple Blotch (*Alternaria porri*). Bulb size can be greatly reduced due to loss of foliage.

PATHOGEN SOURCE: Volunteer onion plants from previous crops. It survives on infected plant debris and resumes growth during favourable conditions. It then produces spores that are spread to nearby plants by the wind. It normally invades dead or dying onion tissue.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE DEVELOPMENT: Long periods of warm, wet conditions encourage disease development. More than eight hours' leaf wetness at 10-25°C. More infection with longer wetness.

CONTROL: The main management method for this disease is regular applications of registered preventative fungicides. Treatments should be applied when conditions are unfavourable for the fungus (cool and dry weather).

Purple Blotch

(caused by *Alternaria porri*)



Image courtesy of Seminis

SYMPTOMS: Typically beginning as water-soaked lesions, usually with a white centre. Edges of lesions become brown to purple; leaf turns yellow above and below the lesions. Dark brown to black concentric rings form throughout lesions. Lesions may girdle the leaf causing it to collapse and die. Similar symptoms occur on seed stalks and infected stalks can collapse resulting in shrivelled seed development. When bulb infection occurs, it is normally through the neck. The infected area of the bulb is initially bright yellow, but eventually turns a characteristic red wine colour.

PATHOGEN SOURCE: The pathogen overwinters in crop residue on or near the soil surface. The spores are spread by wind and splashing rain or irrigation.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE DEVELOPMENT: Fungal growth of spores is fostered by temperatures of 6-34°C with the most optimal temperature of 25°C. Cycles of high and low relative humidity encourage spore growth.

CONTROL: A fungicide spray program with broad spectrum protective fungicides applied prior to infection can provide good protection.



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Disclaimer: It is possible to have more than one disease on a single onion plant or bulb. To confirm the presence of a disease it is recommended that sampling and testing be undertaken by a plant pathologist. Consult your local agronomist.