

Onion disease identification information • 2018/19



Image courtesy of Seminis

Pink Root

(caused by *Phoma terrestris*)

SYMPTOMS: Infected roots are a light pink colour turning reddish-purple as roots disintegrate. Leaves turn yellow or brown starting at tips and eventually die. Bulbs from infected plants are usually undersized in susceptible varieties.

PATHOGEN SOURCE: Infected soil, plant debris. Fungus can be spread through soil movement and surface water.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Soil temperature between 24-28 degrees C. Very little disease below 16 degrees C.



Image courtesy of Seminis

Fusarium Basal Rot

(caused by *Fusarium oxysporum f. sp. cepae*)

SYMPTOMS: Above ground symptoms include yellowing, curling and necrosis at the leaf tips. Older leaves are affected first and eventually wither and decay. Infected roots are dark brown, flattened, transparent and sometimes hollow. Affected bulbs cut vertically may show a brown discolouration of the outermost layer of the stem plate, which may rot in storage.

PATHOGEN SOURCE: Infected soil, plant debris. May be aggravated by root injury.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Soil temperature between 25-28 degrees C. Bulb rot is worse at temperatures greater than 25 degrees C.



Image courtesy of S Jones, Tasmanian Institute of Agriculture

White Rot

(caused by *Sclerotium cepivorum*)

SYMPTOMS: First symptoms include yellowing, wilting and dropping of older leaves. As fungus invades the root system and basal plate, it causes a rot, resulting in foliage collapse. Soft rot develops in the bulbs and a thick white mycelial growth develops on the bulb base. Numerous black sclerotia form on the diseased tissue. Usually appears on groups of plants in the field

PATHOGEN SOURCE: Infected soil. Sclerotia may lay dormant in soil for many years.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Air temperature 14-18 degrees C, moist soil. Growth stops at air temperature above 24 degrees C.



Image courtesy of Seminis

Downy Mildew

(caused by *Peronospora destructor*)

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.

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 air temperature less than 23 degrees C (optimum 10-12 degrees C) and the presence of free water on the leaf surface or relative humidity above 95% between approximately 2am and 7am with little to no rain in that period for spore production. 9-16 days latent period between infection and spore production. A few hours of sunny, dry weather can dramatically impede disease progress.



Image courtesy of Seminis

Stemphylium Leaf Blight

(caused by *Stemphylium vesicarium*)

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 very similar to Purple Blotch. Bulb size can be greatly reduced due to loss of foliage.

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

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: More than eight hours leaf wetness at 10-25 degrees C. More infection with longer wetness.



Image courtesy of Seminis

Botrytis Brown Stain

(caused by *Botrytis cinerea*)

SYMPTOMS: Can infect the outer scales of storage onions. Fungus spores germinate on onion leaves, producing enzymes that result in superficial flecking. Fungus growing into bulb scales causes a brown stain on the neck and outer scales.

PATHOGEN SOURCE: Wide host range.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Wet weather close to harvest. Discoloured skins can fall off if bulbs are dry in storage



Image courtesy of Seminis

Bacterial Soft Rot

(caused by *Erwinia*, *Pseudomonas* and *Enterobacter* species)

SYMPTOMS: Leaves may become infected and this can progress to the neck of the onion and then to the bulb. Affected scales first appear water-soaked and pale yellow to light brown or bleached grey to white. Invaded fleshy scales become soft and sticky with the interior of the bulb breaking down. A watery, foul-smelling liquid can be squeezed from the neck of diseased bulbs.

PATHOGEN SOURCE: Plant debris, infected soil and irrigation water. Splashing rain, irrigation water and insects spread the pathogen.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: High humidity and temperature. High rates of nitrogen fertiliser and applications late in the growing season tend to increase the incidence of rotten bulbs.



Image courtesy of S.K.Mohan, Bugwood.org

Botrytis Neck Rot

(caused by *Botrytis allii*)

SYMPTOMS: Infected plants rarely show symptoms. Occurs primarily on stored onions. Tissue becomes soft and spongy as fungus continues to grow into the bulb. Affected parts of the bulb are brown and water-soaked, and diseased tissue eventually collapses.

PATHOGEN SOURCE: Infected seed, infected volunteer onion plants, sclerotia can survive in soil for two years. Airborne spores. Bulbs can be infected from mechanical damage.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Prolonged moist growing conditions. High humidity in storage.

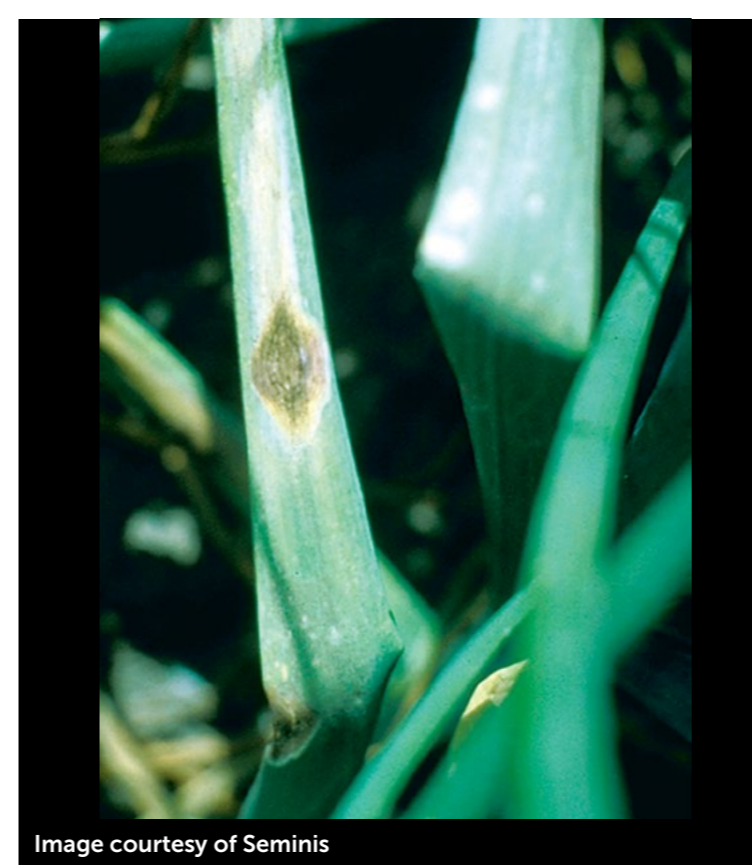


Image courtesy of Seminis

Purple Blotch

(caused by *Alternaria porri*)

SYMPTOMS: Symptoms begin 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. 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: Infected debris and bulbs. Onions infested by thrips are more susceptible.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Temperature from 6-34 degrees C, optimum 25 degrees C. Relative humidity above 90% for spore production, extended humid periods more than 16 hours lead to more disease lesions.



Image courtesy of Seminis

Damping-Off

(caused by *Pythium* species)

SYMPTOMS: Water-soaked lesion develops on lower stems of 1-2 leaf seedlings and watery rot occurs on roots. Can also attack seeds before emergence and cause watery decay. Older infected plants are stunted and yellowing and wilting of leaves may occur during severe infections.

PATHOGEN SOURCE: Widespread in soils.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Disease is almost always as a result of suitable environmental conditions of high soil moisture and soil temperature below 18 degrees C.



Image courtesy of Howard F. Schwartz, Colorado State University, Bugwood.org

Black Mould

(caused by *Aspergillus niger*)

SYMPTOMS: Generally develops on the outer fleshy bulb scale of harvested bulbs. Infected bulbs develop a black discolouration on the bulb scales. Clusters of black spores generally form along veins and on or between the outer papery scales of bulbs. Infected tissue first has a water-soaked appearance and over time will dry and shrivel.

PATHOGEN SOURCE: Commonly occurs in soil and dead plant tissue. Infected seed.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Optimum temperature for growth is 28-34 degrees C. Humidity above 80% can lead to rapid disease development in bulbs.



Image courtesy of South Australian Research and Development Institute (SARDI)

Mallee Stunt

(caused by *Rhizoctonia solani* AG8)

SYMPTOMS: Above ground symptoms vary from obvious patches of severely stunted plants to widespread, less noticeable symptoms that still reduce bulb size and yield. Roots have spear tips and sunken cortex. May occur in tandem with other root diseases such as pink root and root lesion nematode.

PATHOGEN SOURCE: Commonly occurs in soil and host debris especially in cereal rotations, and will live on cereal nurse crops grown to protect onions from wind erosion. Has a wide host range.

ENVIRONMENTAL CONDITIONS OPTIMUM FOR DISEASE

DEVELOPMENT: Optimum temperature for growth is 10-15 degrees C. Lack of soil disturbance allows the fungus to spread. Worse in coarse sandy soils.