



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

COMMON DISEASES OF

LETTUCE



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1. Downy Mildew

- Caused by the fungus *Bremia lactucae*.
- Outer leaves have pale green or yellow areas that later turn brown. Affected areas often have an angular margin where they are limited by a leaf vein. White, fluffy growth develops on the undersides of these areas.
- Favoured by cool, humid, overcast or wet weather, particularly when leaves remain wet for several hours.
- Spores spread with air currents from infected lettuce plants or crop debris.
- Resistant varieties are available.
- Chemical controls need to be applied early to prevent the disease spreading.

1



2. Spotted Wilt

- Caused by Tomato spotted wilt virus (TSWV).
- Symptoms can be highly variable. Leaves may yellow and new growth may become distorted and stunted. Brown circular leaf spots may also appear. Heart development can be lopsided and plants may collapse and die.
- Occurs in field and hydroponic lettuce crops, sometimes causing severe losses.
- The virus is spread by some thrips insects (Western Flower Thrips, Onion Thrips, and Tomato Thrips). The virus can infect over 900 plant species including many crop plants and weeds. Thrips monitoring and timely chemical application is essential for effective TSWV management.
- Control weeds in crops, on headlands and in adjoining paddocks, which can harbour thrips and the virus.

2



3. Septoria Leaf Spot

- Caused by the fungus *Septoria lactucae*.
- This fungal disease can infect seedlings, hydroponic and field crops. Infected seedlings have yellow leaf markings with tiny black dots. Larger plants have brown spots with an angular outline on the older leaves or yellowish markings covered with tiny black dots. Symptoms can be confused with Downy Mildew.
- Lettuce seed and seedlings can be important sources of infection. Prickly lettuce weeds and lettuce crop residues can also harbour the fungus. Water splash from rain and overhead irrigation spread the disease within crops.
- Chemical controls need to be applied early to prevent the disease spreading.

3



4. Grey Mould (*Botrytis*)

- Caused by the fungus *Botrytis cinerea*.
- Affected seedlings rot and die. Field and hydroponic crops show a brown and watery rot occurring at ground level. Older leaves wilt and a powdery, greyish-brown fungal growth develops on rotted areas. Affected plants become stunted and may eventually die.
- Cool and wet weather with high humidity favour the disease. Injuries on plants caused by insects, wind abrasion or leaf scars on stems provide sites for *Botrytis* entry.
- Chemical controls need to be applied early to prevent the disease spreading.

4



5. Sclerotinia Rot (Lettuce Drop)

- Caused by either of two fungi: *Sclerotinia sclerotiorum* and *S. minor*.
- Leaves wilt associated with light brown lesions and a soft and watery rot, usually at ground level. White, cottony fungal growth develops on rotted areas. Affected plants eventually collapse and die. Symptoms are similar to Grey Mould (except for the mould's colour).
- Black bodies (fungal resting bodies called sclerotia) develop among the white mould on affected plants. Sclerotia can survive in the soil for several years. *S. sclerotiorum* has sclerotia of about 25mm long with the appearance of rat dung. *S. minor* sclerotia are smaller and rounded (about the size of a match head). *S. sclerotiorum* also produces tiny air-borne spores from brown saucer-shaped bodies that form on the soil surface.
- Disease development is favoured by cool to moderate temperatures and periods of high humidity and wet conditions (from either irrigation or wet weather), and plant injury. The fungi have a wide alternative host range.
- Chemical controls need to be applied early to prevent the disease spreading. Hygienic removal of affected plants and crop trash can reduce the carry-over of the fungi between crops.

5



6. Mosaic and Necrotic Yellows

- Caused by viruses that are spread by certain aphids. (Mosaic: Lettuce mosaic virus [LMV], Cucumber mosaic virus [CMV] or Alfalfa mosaic virus [AMV]; Necrotic Yellows: Lettuce necrotic yellows virus [LNYY])
- Field symptoms of different viruses can be similar and laboratory diagnosis is often needed to distinguish these diseases. Growth and development can be greatly reduced when young plants are infected with any of these viruses.
- Symptoms of mosaic viruses are a light and dark green mottling of leaves. The leaf edge may become frilly or black. Older leaves may have a yellow mottling.
- Symptoms of Necrotic Yellows are yellow patches or flecks on leaves that are also often finely crinkled. Older, heading plants can have dead areas in the hearts but no external symptoms.
- Spring and autumn (when aphid numbers peak) favour this virus. Weeds such as prickly lettuce, shepherd's purse, fat hen, sow thistle, chickweed and marshmallow can host various viruses. Infected seed also spreads LMV.
- Aphid monitoring and their effective management in and around crops is critical for effective disease management.

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7. Anthracnose

- Caused by the fungus *Microdochium panattonianum*
- Small yellow to brown, water-soaked spots develop along leaf midribs and nearer the leaf base. The spots may have a red, circular to angular margin with diameters up to 4mm. The centres may drop out of old leaf spots. Spots on midribs are oval shaped and are depressed into the plant. Heavily infected plants can be stunted.
- Favoured by cool and wet weather.
- Infected seed, seedlings, crop residues and wild prickly lettuce are sources of infection.
- Fungal spores are spread with splashing rain and irrigation water, as well as contaminated soil sticking to clothes, boots and tools. Spores require 2 to 4 hours of free standing moisture (wet leaves) to germinate so irrigations timed to reduce leaf moisture exposure help reduce infection.
- Chemical controls need to be applied early to prevent the disease spreading. Hygienic removal of affected plants and crop trash can reduce the carry-over of the fungi between crops.

7



8. Bottom Rot

- Caused by the common soil fungus *Rhizoctonia solani*.
- Can cause damping-off of seedlings. Outer leaves of field plants wilt and are associated with a rot at ground level with rusty markings on the midribs of the undersides of lower leaves. Affected tissue offers entry sites for bacterial soft rots. In warm, humid weather the rusty lesions expand quickly and the whole heart may rot and die.
- It is spread by water splash, infected crop debris and contaminated soil on boots and machinery etc.
- Limited chemical options are currently available for disease management.

8



9. Bacterial Rots: Varnish Spot, Butt Rot and Soft Rot

- Varnish spot and Butt Rot are caused by any of three *Pseudomonas* species. Soft Rot is caused by *Erwinia* species. These bacteria enter plants through natural openings or damaged tissue.
- Varnish Spot is characterised by small, brown spots or streaks, usually along the midribs of inner leaves. These spots may not be visible from the outside of the lettuce. The small spots can expand quickly and form large shiny brown, slimy areas near midribs, which can rot the lettuce head. Butt Rot occurs where bacteria enter stem bases, causing plants to collapse and die. Soft Rots are wet, slimy rots of the head wrapper leaves that turn dark brown. Young infected plants become yellow and stunted, which can then collapse and die.
- Wind and water splash spread bacteria. Infested crop debris, soil, water and hydroponic nutrient solutions are potential sources of infection.
- Copper sprays can reduce spread of bacteria.

9



10. Pythium and Phytophthora Root Rots

- Caused by the water moulds, *Pythium* and *Phytophthora* species.
- A brown and watery rot of the root system that stunts shoot growth. Severe infections cause plants to wilt and die. Causes damping-off of seedlings.
- Can cause severe losses in hydroponic crops, particularly when nutrient temperatures are elevated (>30°C). A minor disease in field crops.
- Fungal spores are spread in nutrient solutions and by sciarid flies. Dam water, infected seedlings, and wind-blown dust are sources of the fungi.
- Maintaining the nutrient solution below 30°C is critical to managing the disease.

10



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