



# BLACK DOT DISEASE

(*Colletotrichum coccodes*)

## WHAT IS IT?

Black dot is a fungal disease caused by *Colletotrichum coccodes*. It is a global disease and occurs in Africa, the Middle East, Europe and the Americas. Once considered a minor pathogen, recently there have been significant yield losses and reduced quality. The increased sales of washed potatoes have meant that managing the disease has become important.

Often mistaken for silver scurf (*Helminthosporium solani*), it is differentiated by the presence of small black dots (sclerotia) on the tubers (Figures 1 and 2). It is only in the past 10 years that targeted disease management strategies have been developed.



**Figure 1:** Comparison between tuber symptoms of black dot and silver scurf

## KEY POINTS AND RECOMMENDATIONS

- Identified by black, dot-like sclerotia on the tuber or plant
- The pathogen can persist in the soil for up to eight years, reducing the effectiveness of rotations
- Mould board ploughing in combination with long rotations can reduce the inoculum load in the soil
- Chemical controls exist for the disease but should be used as per label instructions
- Do not use seed with high levels of infection or plant into soils with high inoculum loads.



**Figure 2:** Example of a tuber affected by advanced black dot symptoms similar to silver scurf. - Photo SARDI

## WHAT DOES IT LOOK LIKE?

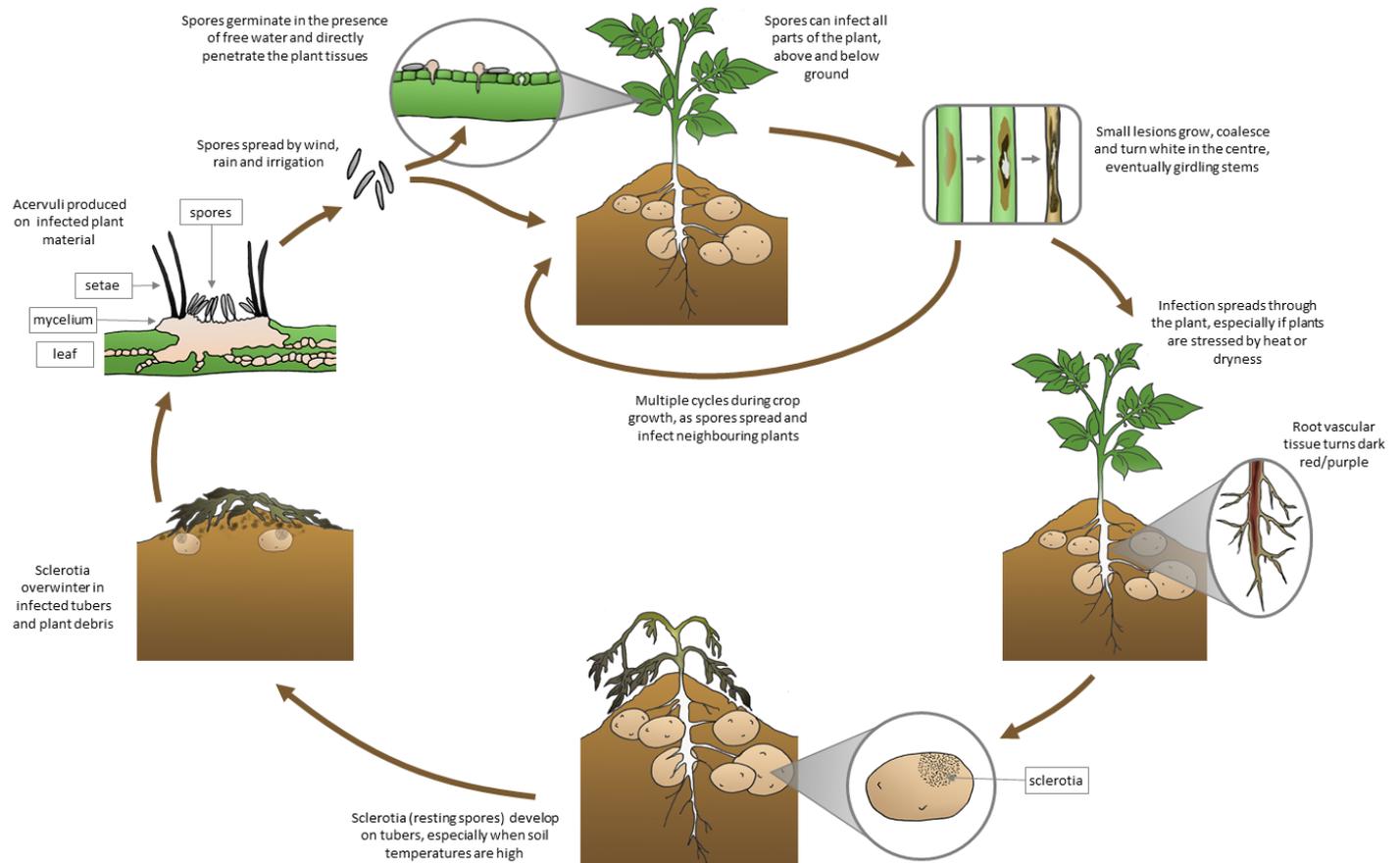
### ON THE PLANT

- The initial symptoms are usually yellowing and wilting of the foliage tips
- Dot-like black sclerotia (fungal bodies) on the stolons,

roots, stem and foliage both above and below ground level (Figure 4)

- Vascular tissues in the roots turn reddish to purple
- Reduced total root growth and rotting of underground stems and roots.

## DISEASE CYCLE



**Figure 3:** A basic life cycle diagram of *C. coccodes* in potato production. Infected seed is the usual entry of the disease to uninfected areas, once established in the soil the pathogen can persist for at least eight years and has many weed hosts that allow it to increase its inoculum load in the soil - Reproduced by J Ekman based on information by P Wharton.

### ON THE TUBER

- Dot-like black sclerotia (fungus) on the tuber (Figure 5)
- Brownish to grey discolouration over a large portion of the tuber, or as roundish spots often larger than half centimetre in diameter
- The organism doesn't penetrate intact tuber skin but can grow and sporulate on damaged tissue.

### WHAT CAN I DO?

- Maintaining good crop health can reduce the impact of weak pathogens such as *C. coccodes*
- The disease can survive in the soil for up to eight years – due to this, crop rotations can have minimal impact
- Long rotations in combination with mould board ploughing can assist in reducing inoculum loads in the soil
- Manage potential hosts to reduce pathogen load in the soil (Table 1)
- Fludioxonil and sedaxane fungicides have been effective at combating the disease\*
- Some cultivars are less susceptible (but not immune) to the disease; consult with your agronomist for the best cultivar for you
- Crop sampling during the season to determine extent of infection to calculate when to harvest (not effective with all cultivars)
- Initial trials with biofumigant compounds have shown limited effectiveness at controlling the disease. Further research is needed to fully understand the usefulness of biofumigation as a control option.



**Figure 4.** Sclerotia on stems and leaves of potato plants.

- Phil Hamm

**Figure 5.** Microscopic image of sclerotia on tuber skin. Photo: Oregon State University Extension Plant Pathology

Family	Scientific name	Common name
Solanaceae	<i>Solanum lycopersicum</i>	Tomato
Solanaceae	<i>Solanum nigrum</i>	Black nightshade
Solanaceae	<i>Solanum esuriale</i>	Quena
Chenopodiaceae	<i>Chenopodium album</i>	Fat hen
Boraginaceae	<i>Heliotropium europaeum</i>	Heliotrope
Brassicaceae	<i>Capsella bursa-pastoris</i>	Shepherds purse
Brassicaceae	<i>Brassica rapa subsp. rapa</i>	Turnip
Asteraceae	<i>Chondrilla juncea</i>	Skeleton weed
Cucurbitaceae	<i>Citrullus colocynthis</i>	Wild tomato
Polygonaceae	<i>Polygonum aviculare</i>	Wire weed

**Table 1:** Weeds and crops that can host *C. coccodes*. Many additional hosts for the disease exist including plants from the Cucurbitaceae, Fabaceae and Solanaceae families. However, many do not develop severe symptoms, and some may be asymptomatic.

## CONDITIONS FAVOURABLE FOR THE PATHOGEN

- Often associated with sandy soils with low nitrogen levels
- 20°C to 30°C is most favourable to pathogen growth, with temperatures over 25°C resulting in the most severe damage to stems and tubers
- Can be spread by wind, especially if sandblasting causes physical damage
- Irrigation after haulm desiccation increases the likelihood of tuber infection
- Crops affected by early dying (*Verticillium* spp.) and root lesion nematodes.

## PREDICTA® PT POSSIBILITIES

Black dot is one of the pathogens for which a PREDICTA Pt soil test can give you a good indication of the disease risk in a field. If this service interests you, [click here for more information](https://www.pir.sa.gov.au/research/services/molecular_diagnostics/predicta_pt) ([https://www.pir.sa.gov.au/research/services/molecular\\_diagnostics/predicta\\_pt](https://www.pir.sa.gov.au/research/services/molecular_diagnostics/predicta_pt)).

## FURTHER READINGS

<https://ausveg.com.au/infoveg/infoveg-database/>

- 2005 – PT01001 Control of black dot in potatoes
- 2009 – PT06014 Reducing the impact of black dot on fresh market potatoes

<https://www.vegetables.cornell.edu/pest-management/disease-factsheets/black-dot-disease-of-potatoes/>

<https://cropscience.bayer.co.uk/threats/diseases/potato-diseases/black-dot/>

<https://www.syngenta.com.au/news/potatoes/managing-black-dot>

<https://ahdb.org.uk/knowledge-library/crop-duration-and-soil-inoculum-as-predictors-of-black-dot-risk-after-storage>

<https://ahdb.org.uk/knowledge-library/black-dot>

\*Always read and follow label instructions when using fungicides