



Root disease

Root rots

Introduction

Mature root rots can be caused by multiple different plant pathogens. Soil conditions, plant stress, pest damage and previous infection (see Seedling disease fact file) can all contribute to in-field root rot damage. Infection can also arise post-harvest; minimise harvest/topping damage and monitoring clamps to help limit this risk. With all root rots, avoid storing infected roots for prolonged periods following harvest.

The pathogens most commonly associated with sugar beet mature root rots are listed in this Fact File.

Fusarium

Pathogen: Various species in the *Fusarium* genus (eg. *Fusarium oxysporum*)

Symptoms: Black rot on the external root surface, typically seen from mid-June onwards

Risk: Pathogen is favoured by warm soils, with optimum disease development occurring above 27°C

Comments: Yield losses to *Fusarium* can be severe, particularly if the roots are stored in clamps. *Fusarium* infection often occurs on previously damaged or weakened plants (e.g. drought stress, boron deficiency or harvest damaged roots).



Figure 1. *Fusarium* infection



Figure 2. *Fusarium* infection

Girth Scab - *Aphanomyces*

Pathogen: *Aphanomyces cochlioides*

Symptoms: Wide bands of brown lesions form on the upper part of the tap root in a vertical pattern. Seed treatments prevent severe damage early in the season but later attacks show typical symptoms on the roots.

Risk: Low. Whilst it is relatively common to see damage on harvested roots, the level of damage to the roots is usually minimal.

Comments: Very high levels of damage can cause root-malformation or even plant loss but it is usually mild and found in distinct patches.



Figure 3. *Aphanomyces* infection

Rhizoctonia root rot

Pathogen: *Rhizoctonia solani*

Symptoms: Appearing from the middle of June onwards, dry rot spots gradually deepen close to the soil surface. Typically, rhizoctonia symptoms appears in patches

Risk: Wet, poorly drained soils favour development and spread of the disease, with an optimum temperature of 25-33°C

Comments: Yield losses vary in severity from negligible to more than 50%. There are no current chemical treatments for rhizoctonia root rot, with best management being to avoid close rotations of susceptible crops (e.g. maize, beans).



Figures 4 and 5 (above). Rhizoctonia infection

Violet root rot

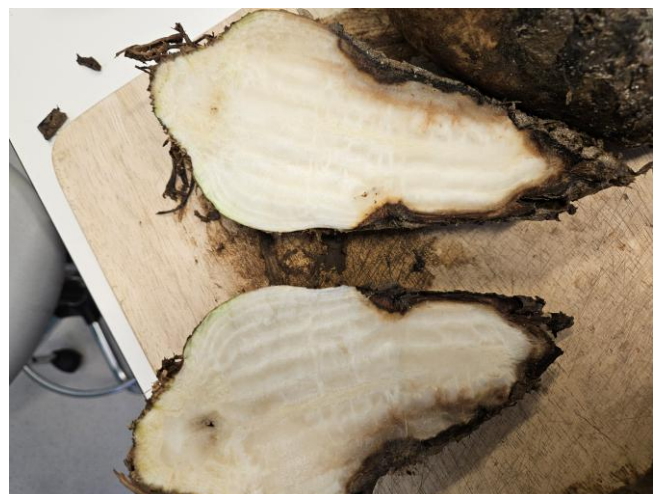
Pathogen: *Helicobasidium purpureum* (also known as *Helicobasidium brebissonii*)

Symptoms: Later in the season, characteristic purple lesions form on the root surface, typically starting at the root rather than the crown. Usually occurs as patches in fields but can spread easily in clamps

Risk: Favoured by temperatures above 13°C. Crop rotations including alternative host plants (e.g. carrots, potatoes) can increase disease pressure.

Comments: Generally violet root rot doesn't affect whole fields or destroy plants, but it will reduce root yield and sugar content and increase soil tares.

There are no treatments for violet root rot. Avoiding tight rotations of host species and controlling weed hosts can help to manage the disease.



Figures 6 and 7 (above). Violet root rot infection