

Rhizoctonia

CHARACTERISTICS

Development conditions

In the absence of a host plant, the fungus can persist for many years in the soil in the form of small brown or black survival structures called “sclerotia”. When the soil temperature reaches a certain level (around 15°C), secretions produced by the host plants activate the sclerotia, which begin to generate a mass (“mycelium”) of long filaments (“hyphae”). This makes contact with the roots and attaches to their surface and the mycelium then proliferates on the root. As the fungus develops, it diverts the plant’s cell resources and uses them for its own growth. The fungal mycelium gradually invades the cells, killing them and producing survival structures inside the cells. The plant starts to die as the xylem (sap-conducting) vessels are attacked.

Rhizoctonia solani sclerotia can be dispersed by the wind, by water (rainfall, drainage or irrigation), as well as by soil transport mechanisms such as erosion, soil cultivations and uprooting.

The ideal development conditions for the fungus are abundant rainfall and high temperatures in spring and summer.



IN BRIEF

Root disease caused by the soil fungus *Rhizoctonia solani*.

In sugar beet, the disease causes a dark brown rot of the root and crown.

Host plants

The phytopathogenic fungus *Rhizoctonia solani* was discovered in 1858 and can affect a wide range of plants in addition to the sugar beet, including maize, soya, carrot, bean, ryegrass, weeds, etc.

Symptoms

IN THE ROOTS

- ◀ A dark brown or black dry rot on the surface or in the interior.
- ◀ In some cases, the entire beet may disappear, particularly at the centre of an outbreak.

The symptoms can be confused with those of other root rots such as aphanomyces or pythium.



IN FOLIAGE

- ◀ Sudden wilting of the foliage, leading to chlorosis and ultimately complete necrosis of the leaves.
- ◀ The dead foliage remains attached to the crown, where it forms a rosette of brown leaves.
- ◀ New leaves may appear in the middle of this rosette just before the plant dies.



In severely contaminated fields the damage caused by the fungus can have significant economic consequences. These include major losses in yield (up to 100% in the most contaminated areas), low sugar content, increased soil tare, poor processing quality, problems with beet storage, and increased levels of unsaleable beets.



INTERVIEW WITH A SESVANDERHAVE EXPERT



Hendrik Tschoep

SESVANDERHAVE PLANT BREEDER / EXPERT IN RHIZOCTONIA ROOT ROT

BIOTIC STRESS DEPARTMENT

Hendrik Tschoep

WHAT METHODS ARE AVAILABLE FOR COMBATING RHIZOCTONIA ROOT ROT?

In the first instance, extending rotation to between three and five years allows the infectious potential of the soil to be reduced. Next, host plants (maize, soya, ryegrass and vegetables such as carrots and salsify) should, as far as possible, be avoided in rotation by introducing a straw cereal before sowing. Careful weed control should also be exercised (some weeds can be host plants, e.g. chenopodium (Goosefoot)). Maintaining good soil structure is also an important factor and build-up of maize straw in the bottom of ploughed furrows should be avoided. This stops the residue breaking down quickly, and causes it to act as a source of inoculum for outbreaks of *Rhizoctonia solani* in the following spring. Looking beyond all these agronomic measures, choosing a tolerant variety will allow the yield potential of a plot to be safeguarded.

HOW IS SESVANDERHAVE POSITIONED IN THIS MARKET SEGMENT?

SESVanderHave has been the market leader for several years in the majority of Western European countries; the main sugar beet markets. Our strength is that we offer a highly diversified range in terms of resistance, from highly resistant lines for the most contaminated fields, to more “all-purpose” lines for lower levels of contamination.

TO WHAT DOES SESVANDERHAVE OWE ITS SUCCESS?

SESVanderHave takes into account, to the greatest extent possible, the demands of the market and of growers of our varieties. This means that we develop varieties of sugar beet which offer different levels of resistance and which still deliver good yields and good sugar content. At the moment, no plant breeder is able to promise total immunity to rhizoctonia root rot, but SESVanderHave is working to improve both resistance levels and yield. Our long experience in

disease resistance is combined with state-of-the-art biological techniques. We have dozens of scientists examining our different genetic combinations every day, and this research is clearly delivering results.

ARE YOU EXPECTING TO REMAIN AT THE CUTTING EDGE IN THIS MARKET SEGMENT?

Nobody can predict the future, but we are always looking for new methods of further improving our varieties. We analyse every detail in our glasshouses, growth chambers and laboratories, as well as via thousands of field tests. Our challenge is to incorporate other traits into our rhizoctonia root rot lines, in particular tolerance of cercospora or increased tolerance of rhizomania. This is in response to demand from some regions. There is no doubt that SESVanderHave is committed to its aim of retaining its leadership position in this market segment.



More info?

Check our social media channels and website www.sesvanderhave.com