NORTH WEST DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT
AGRICULTURAL SUPPORT SERVICES

Presentation title: Sclerotinia Diseases in Sunflower

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Sclerotinia Diseases in Sunflower

- Sclerotinia diseases are caused by the soil-borne fungal pathogen *Sclerotinia sclerotiorum* which is often called the "white mold" fungus.

  This pathogen is a serious threat to sunflower production all over the world.

  It is probably the most common and widespread pathogen affecting sunflower globally.

  The fungus can infect the sunflower plant (root, stem and head) during all stages of plant development resulting in several types of symptoms.

  Thus, *S. sclerotiorum* causes two disease phases (Sclerotinia Stem Rot on the one hand, and Mid-stalk Rot and Head Rot on the other hand), depending on the mode of germination of the overwintering sclerotia.

Sclerotinia Diseases in Sunflower

Sclerotinia Stem rot

A water-soaked lesion develops at the base of the plant.

The lesion becomes a grayish green to brown canker that often girdles the stem.

As decay progresses, the stalk becomes bleached and has a shredded appearance.

The decayed portion may extend a foot or more up the stem.

Sclerotinia Diseases in Sunflower

Sclerotinia Middle Stalk Rot

Middle stalk rot is usually observed around flowering time in the middle to mid-upper portion of the stalk.

It begins as a brownish to grey water-soaked lesion, most commonly found at or near the leaf node.

A canker develops around the stalk, and the decayed tissue often has a wet, pulpy consistency.

Usually the stalk falls over at the point of decay and the tissues above the canker die.

Often a dense white mycelium and some sclerotia will be produced both inside and outside the stalk, especially during wet weather.

Eventually the affected tissues become bleached and have a shredded appearance.

Sometimes a leaf will be infected with *Sclerotinia* and the fungus will cause decay of the petiole and eventually reach the stem to cause middle stalk rot

Sclerotinia Middle Stalk Rot

Sclerotinia Head Rot

The first symptoms of head rot are usually either the appearance of a white fungus mycelium growing over the flower parts or the development of water-soaked spots on the receptacle (the fleshy part of the head).

The fungus grows profusely within the receptacle, causing its decay, and produces white mycelium and many large black sclerotia.

The receptacle is usually bleached and is easily distinguished from a healthy head.

The entire receptacle can rot and the seed layer falls away, leaving only a bleached, shredded skeleton which consists of vascular bundles interspersed with large sclerotia. These bleached skeleton heads are very obvious in the field, often from a distance.

When harvested, infected heads often just shatter and all remaining seed is lost.

During wet weather the fungus will grow over the seeds and form large net-like sclerotia which can cover the front of the head.

Sclerotinia Head Rot

Control and Management

S. sclerotiorum is one of the most difficult pathogens to control.

An integrated control program that includes the following is recommended:

(1) use of hybrids with a good tolerance profile,

(2) cultural practices that avoid high planting densities and a 3 to 4 year crop rotation with non-host crops,

(3) timely application of fungicides, and

(4) implementation of agronomic practices that can produce a deterioration of sclerotia on the soil surface.

Circumstances and economic feasibility determine which combination of methods can achieve the desired control.

Control and Management

Crop rotation may not have a major impact on head rot and mid-stem infections because airborne ascospores can blow in from nearby fields.

High crop density and high nitrogen fertilization contribute to the formation of a dense canopy, which raises the humidity level and creates an environment favorable for carpogenic germination of sclerotia.

Wide plant spacing allows air movement, thus drying the soil surface and reducing the chances for apothecial formation and ascospore viability.

Foliar fungicide applications have limited efficacy against sclerotinia stem rot. However, when applied preventatively, foliar fungicides can be very effective against Sclerotinia head and middle stalk rot.