Spotted Ghostly White Stems in Canola This Season? BMPs for White Mold in Canola

Dr. Madeleine Smith



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Talk Outline

- White mold the disease
- Management practices
- Take home messages



White Mold



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What is White Mold?

- Caused by the fungus Sclerotinia sclerotiorum
- Fungus has a wide host range-over 400 species
- Persists in the soil for several years



Life Cycle of White Mold





Symptoms of White Mold



Photo: J. Venette, North Dakota State University



Photo: XB Yang, Iowa state University



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Symptoms of white Mold



Photo: Beth Hoar





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Why is White Mold a Problem?

- wide host range
 - rotational crops are often a host
- Prolonged survival in soil –not short lived
- Can travel large distances- other sources of inoculum



Management of White Mold

- Varietal selection
- Crop rotation
- Tillage
- Seeding
- Risk Forecasting
- Fungicide applications



Varietal Selection



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Varietal Selection

• Influence white mold in several ways:

Lodging

- Canopy architecture
- Apetalous



Varietal Selection

Lodging rated on 0-9 scale

-0 =standing, 9= flat

- Varieties available around 2.5 -2.8

 https://www.ag.ndsu.edu/varietytrials/ca nola



Crop Rotations



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Crop Rotation

- Important because of long lived sclerotia in soil
- Grasses e.g. wheat non-hosts
- Four year rotations- can be shorter



Crop Rotation

- Things to remember about crop rotations:
- The longer the better
- Consider disease pressure in adjacent fields
- Ascospores can travel long distances.







Tillage Burying sclerotia in the soil prevents them from germinating apothecia and ascospores

- However, possible that deeply buried sclerotia do not decompose as fast as those near the surface.
- These buried sclerotia may be viable if returned to the soil surface



Plant Density



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Plant Density

- Don't exceed recommended planting rate
 - Increased density =conducive microclimate
 - Increased density = increased lodging



Plant Density

- Things to remember about plant density
 - decreasing plant density can open up the canopy but, must maintain yield
 - variety dependent- approx. 5lbs/acre for yield
 - Some varieties may compensate for lower plant density by producing more biomass
 - In years conducive for white mold, disease may spread anyway



Risk



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Risk

- Assessing risk of disease development is important when thinking about best management
 - Return on investment
- Use risk to asses need for application of fungicides



When are you Most at Risk From White Mold?

- Apothecia observed in field
- Periods of cool, wet weather
- Dense and/or lodged canopies which create a moist microclimate optimal for disease development
- Spore release at flowering



Conditions That Favor White Mold

- Likes cool moist conditions
 - Canopy closure
 - Row spacing



Risk- Early indicators

- Production of apothecia "mushrooms" in the field at the beginning of the season
- Petal test- asses petals which are infected from a sample from the field



How Can I Assess Risk?

- <u>http://www.ag.ndsu.edu/sclerotinia/</u>
- Sclorotinia risk cards: http://www.saskcanola.com/quadrant/m edia/canola/pdfs/canola_disease_scouti ng.pdf



Risk

- Determine the level of risk as flower begins and track through flowering period
 - Split applications



Fungicides



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Fungicides

- If risk levels are high, fungicide applications can be considered
- Aim to spray when the majority of petals can be covered and therefore protected



Fungicides- things to consider

- Product
 - A number of products are labelled for use to control white mold
- https://www.ag.ndsu.edu/extplantpath/p ublications-newsletters/fungicides/2016fungicide-guide-full-version



Fungicide Products

- Boscalid Endura
- Metconazole- Quash

Prothioconazole- Proline



Fungicide Application

20-50% bloom

- Consider split applications if weather is cooler and likely to prolong flowering
- Consider rotating chemistries in split applications-resistance



Fungicide Applications

- Don't spray if risk is low
- Always follow current labelling



Take Home Messages

- Consider variety and rotational history in fields
- Scout if possible
- Spray when necessary



Questions?

Please contact me at:

smit7273@umn.edu





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Why Do We Use Inoculated Nurseries?

- To evaluate disease control measures, we need good disease pressure
 - Natural infection does not always occur depending on environmental conditions
 - Natural infection may not occur uniformly over the whole trial



- These are important factors whether we are evaluating:
 - Varietal resistance
 - Cultural control
 - Chemical control



Requires inoculum production

White mold – seeding ground with sclerotia, spore spraying

 Blackleg-spraying of spores at seedling stage



- Requires susceptible varieties
- Whitemold- varieties with increased lodging potential
- Blackleg- Weststar



 Must provide the right conditions for disease development

- irrigation



Nursery Crookston 2015

- Approx. 1 acre
- Misted using overhead misting system
- Plots 15 x 5 ft with 3 ft gaps between plots





- Determine best inoculation methods for our environment
- Utilize plots to evaluate chemical and biocontrol agents
- How these work with cultural control methods



Results

- Irrigation system was successfully set up
- Disease was successfully introduced to plots
- Although all inoculated plots had disease, it did not spread evenly



Conclusions

- Due to timing of the grant award, we were not able to prepare enough inoculum for the best application methods in 2015
- Optimal methods will produce more even disease spread



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