Research


- Initiated surveys in 2015 and 2016
Products

- Fact Sheet/Grower Handout on Blackleg
Blackleg in Canola and other Crucifers
What You Need to Know

THE FACTS:
- The WSDA Crucifer Quarantine now includes all counties of eastern WA
- Blackleg has been confirmed in northeast OR grower fields and at the Pendleton research station
- Lesions have been observed in ID canola and rapeseed fields; the disease has been described as ‘common’ but not severe
- Blackleg has been confirmed in Garfield Co. based on a few infected leaves of volunteer from the 2015 canola crop

WHEN BUYING SEED:
- Buy ONLY tested and certified blackleg-free seed
- Look for the green WSDA tag on each seed bag indicating Crucifer Quarantine compliance (including cover crop mixtures)
- Ask your seed rep for varieties with MR (moderately resistant) or R (resistant) blackleg rating
- Apply seed treatment (most companies already do but double check that)

AFTER EMERGENCE:
- Scout fields for any lesions on leaves and/or cankers on stems (see back for photos)
- Continue to monitor fields throughout the growing season

SCOUTING PROTOCOL to avoid spreading blackleg
- Wear rubber boots
- When finished scouting/sampling a field, scrape and wash off any soil adhering to boots
- Spray boots with 70% alcohol (isopropyl alcohol works well)
- Remove boots and wear clean shoes until reaching the next field

IF BLACKLEG IS OBSERVED (current crop or past crop residue)
- Place fresh leaves and/or stems in a zipper bag. If they are wet, blot them dry on a paper towel.
- Mail (preferably overnight) or deliver samples to the WSDA Plant Diagnostic Clinic, UI or OSU Plant Pathology departments (see contact info on next page)
- Follow recommendations for applying fungicide ONLY if blackleg is confirmed and at or above threshold levels

HARVEST and TRANSPORTATION
- Make sure combine is set properly to reduce as much seed loss as possible
- Tarp trucks and seal up rear gates and belly dumps before delivery

OTHER KEY RECOMMENDATIONS
- Control Brassica/crucifer volunteers and weeds in fields and field borders
- Rotate canola and other brassicas; grow no more than once every 3 years on the same field
- Learn how to identify blackleg symptoms; be vigilant in scouting fields
Extension

• Presented talks on diseases of oilseeds at workshops in Odessa, Colfax and Dayton in Jan-Feb. 2016- approx. 200 growers.

• Presented talk on field day in Pomeroy May, 2016
Extension

• Presented talks on diseases of oilseeds at workshops in Hartline, Ritzville, and Clarkston in Jan-Feb. 2017-approx. 300 growers.
WSDA Quarantine Actions Enacted in 2016

• These rules require crucifer seeds to be:

  • Laboratory tested and certified as free of blackleg.
  • Seed treated with fungicide
  • Tagged for sale indicating the seeds have met the test and treat requirements
WSDA Actions
Leptosphaeria biglobosa

- A very weak pathogen, probably widespread.
Blackleg

• ITS and beta tubulin sequencing confirmed as *L. biglobosa* ssp. *austaliensis*. 
Research

• Cropping systems - with Bill Schillinger.

• Management of fresh wheat residue for irrigated winter canola - WA DOE.

• Plot froze out 2 years in a row.
Theories

- Straw produces toxic compounds.
- Decomposing straw immobilizes nitrogen.
- Excess straw interferes with drill performance.
- Excess straw keeps soils too wet and cool.
- Straw shades WC seedlings and interferes with photosynthesis.
- Straw serves as a food base for soil-borne pathogens, increasing disease, especially for Pythium and Rhizoctonia.
- Elongated hypocotyl in tall WW stubble makes WC more susceptible to winter damage.
Irrigated Winter Canola Experiment

- Treatments (established on fresh irrigated winter wheat stubble):
  - Burn + double disk
  - Chop stubble + moldboard plow
  - Burn + direct seed
  - Direct seed into standing residue
  - Broadcast into not-yet-harvested wheat (New for CY 2014)

- Randomized complete block design with four replicates (i.e., 20 plots). Each plot 100-ft long.
Direct seeding into newly-harvested 141 bushel winter wheat stubble cut 15 inches above the ground
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Firebreak

**** treatment was disked
Effect of Residue Treatments on Emergence and Damping-Off of Canola, Schibel Plot, Sampled Oct., 2016
Additional Research with Bill Schillinger

- Spring wheat after winter canola or winter wheat - Reardan (Hal Johnson)
- Consistent yield drag after WC.
- Why? Contrary to most literature.
Additional Research with Bill Schillinger

- Difference in water use?
- Difference in N?
- Herbicides?
- Residue?
- Pathogens? Root lesion nematodes- Winter canola a good host for *P. neglectus*
Looked at Microbial Communities

• Sampling by Jeremy Hansen (Anne Kennedy and Tara Sullivan) in Ritzville, Washtucna and Mansfield
• Did PLFA and T-RFLP analysis
• Implicated AMF fungi?
Looked at Microbial Communities

- With Dan Schlatter, did next-generation sequencing on DNA from same samples—bacteria and fungi with MiSeq
Crop and season each explain only 11% of the variation, very low.
Fungal Communities

- Found 950 OTUs or species
- No fungal group consistently higher in winter canola
- However, many cereal pathogens consistently higher in winter wheat
Fungal Communities

- *Thanatephorus cucumerinum* (*Rhizoctonia solani*)
- *Ceratobasidium* (could be *R. cerealis*)
- Snow molds- *Typhula*
- *Fusarium*
Fungal Communities

- Some *Ceratobasidium* higher on canola
- Could be AG I which is more pathogenic on canola
Conclusions

- So far, no “smoking gun” of a bacterial or fungus that could be responsible for yield drag
- Analysis is only beginning
Questions?