

Washington Grain Commission
Wheat and Barley Research Annual Progress Reports and Final Reports

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Project #: 3019-3564

Progress Report Year: 1 of 3 (*maximum of 3 year funding cycle*)

Title: Fusarium Crown Rot on Wheat: Prebreeding and Development of Tools for Genetic Disease Management

Investigators: Mike Pumphrey, Kim Garland-Campbell, Timothy Paulitz

Cooperators: Yvonne Thompson, WSU, Arron Carter, WSU; Chris Mundt, OSU, Grant Poole, Syngenta

Executive summary:

- A mini-core collection of spring wheat germplasm has been developed and greenhouse screening has begun.
- Spring and winter wheat varieties are currently being evaluated in the Wheat Growth Facility. Ratings will take place in Winter-Spring 2016.
- Inoculated trials for spring wheat in Ritzville and winter wheat in Mansfield were conducted in the 2014-2015 crop year. Ratings are still being analyzed, and will be presented at the Feb. meeting.
- Because of the high levels of *Fusarium* seen in variety testing sites, ratings were taken at Creston, Reardon, Lamont, and Ritzville. Initial results from these trials have identified SY107, ORCF103, and WA8227 with more susceptibility to Fusarium crown rot. Coda, IDN-06-18102A, WA 8202, WB-1070CL, and ARS010679-1C were identified with more resistance to Fusarium crown rot than other lines. We will compare these results to the greenhouse assays to determine how predictive the greenhouse assays are of field results.

Impact:

- **What measurable impact(s) has your project had in the most recent funding cycle? We have just started this project, but already have a ratings of winter wheat from 4 variety testing locations. Once we combine with greenhouse and inoculated field trials, we will have useful information will be disseminated to growers via field days, seed brochures, etc to make variety selections.**

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WGC project number: **3019-3564**
WGC project title: **Fusarium Crown Rot on Wheat: Prebreeding and Development of Tools for Genetic Disease Management**
Project PI(s): **M. Pumphrey, K. Garland-Campbell, and T. Paulitz**
Project initiation date: **7/1/2015**
Project year: **Year 1**

Objective	Deliverable	Progress	Timeline	Communication
<p>Objective 1. Perform association mapping on spring and winter core collections to identify further sources of resistance.</p> <p>Objective 2. Screen all variety and regional nurseries for resistance in greenhouse screening.</p> <p>Objective 3. Expand field testing to two locations, and test variety and regional nurseries. Evaluate new seed treatments, since there is little information on how seed treatments may protect against this disease.</p>	Resistant sources that can be used for variety development.	A mini-core collection was developed for the spring core collection. The mini-core is current being screening in the Wheat Plant Growth Facility. The initial ratings will take place in winter 2016. Additional replications may be needed and will be screening in the spring of 2016.	Greenhouse screening completed by the end of 2015. Data analysis completed by Fall of 2016.	None in 2015, first year of grant.
	Ratings of varieties for Fusarium tolerance in the the WSCIA seed buyers guide and other publications.	WSU winter variety trials are being screening in the Wheat Plant Growth Facility. These will be rated in winter 2016. The spring wheat variety trials will be evaluated in spring and summer 2016.	Ongoing, Every year. Completion of that year's greenhouse trials by August.	None in 2015, first year of grant.
	Ratings of varieties for Fusarium tolerance in the the WSCIA seed buyers guide and other publications. Evaluation of seed treatment chemicals for efficacy against Fusarium crown rot.	Because of the widespread incidence of Fusarium crown rot in field locations in 2015, we sampled from WSU winter variety trials at Reardan, Creston, Ritzville, Harrington, Lamont and St. Andrews. We also planted an inoculated winter wheat trial at Mansfield and and inoculated spring wheat trial at Lind. These are currently being rated. Initial results from these trials have identified SY107, ORCF103, and WA8227 with more susceptibility to Fusarium crown rot and Coda, IDN-06-18102A, WA 8202, WB-1070CL, and ARS010679-1C with more resistance to Fusarium crown rot than other lines. We will compare these results to the greenhouse assays to determine how predictive the greenhouse assays are of field results.	Two locations have been planted in fall 2014. Nursery evaluation will be ongoing with data analysis compelted by Jan. of each year following the field trial.	None in 2015, first year of grant.

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