

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

Project #: 4127 1298

Progress Report Year: __3__ of __3__ (*maximum of 3 year funding cycle*)

Title: Integrated Pest Management (IPM) for the Wheat Midge

Cooperators: *Diana Roberts (WSU Extension Spokane/Lincoln Counties), Ed Bechinski (UI Entomology), Rory Eggers (Primeland)*

Executive summary: The wheat midge (also known as the orange wheat blossom midge - OWBM) is a known pest of spring grains (wheat and barley) in the Midwest and Canadian prairies. The midge has been troublesome in Boundary County, ID, for 20+ years. The last 5 years it has caused concern on the Rathdrum Prairie, ID, and Peone Prairie that lies NE of Spokane City.

In 2014 we found the wheat midge widespread in pheromone traps located in Spokane, Stevens, and Lincoln Counties. Hotspots were concentrated on Peone Prairie, Rathdrum Prairie, and to a lesser extent, in Stevens County. Pheromone traps contain a sex hormone specific to the species that draw in male insects from a wide area, so number of insects captured do not relate directly to field infestation at that site. Further monitoring (counting insects flying at dusk) is necessary to make definitive determination of the pest pressure while the crop is susceptible (heading out prior to full flowering).

Traps in Whitman and Columbia Counties did not capture any wheat midge in 2014. Little or no grain is being grown currently in Pend Oreille County, which would otherwise be an area of interest.

Soil samples from hotspot areas assayed after harvest have been sent to NDSU to determine if naturally occurring parasitoids are present in the midge

Impact: It is unknown whether the wheat midge will become a major pest in eastern Washington. This project is intended to be proactive in identifying hotspots, developing degree day models that enable growers to use seeding dates to avoid the pest, and quantifying whether insect biocontrols are present in this environment and able to manage the pest. Educating growers and field consultants how to identify and manage the midge is an important component of the project.

Due to confusion about funding cycles, we received only one year's funding (\$14,000) for this project from the WGC. We hope to obtain continued funding under the new proposal to the WGC, Integrated Monitoring of Insect Pests in Cereal Crops with Dave Crowder.

WGC project number:	4127 1298			
	Integrated Pest Management (IPM) for the Wheat Midge			
Project PIs	Diana Roberts (WSU Extension)			
Project Cooperators	Ed Bechinski (UI Entomology), Rory Eggers (Primeland), farmers at Peone and Rathdrum Prairie			
Project initiation date:	6/1/2012			
Project year:	3			
Objective	Deliverable	Progress	Timeline	Communication
a. In Year One and Two, use pheromone traps to determine the range and severity of wheat midge infestations.	The areas of interest include, but are not limited to, Stevens, Pend Oreille, Spokane, Whitman, Lincoln, Asotin, Garfield, Columbia, and Walla Walla Counties.	In 2014, with the help of a technician hired to the project, again we assayed traps across most of the region of interest: Spokane - 11 sites (5 on the Peone Prairie), Lincoln - 2 sites, Stevens - 3 sites, Whitman - 3 sites Columbia - 1 site, and 4 on the Rathdrum Prairie of Idaho. No midge were found in Whitman or Columbia Counties. Midge populations were low, generally. However, some sites on the Peone Prairie had higher populations and growers treated some with insecticide. It should be noted that trap catches are not considered to be a direct measure of pest populations, but do indicate need for sampling within fields.	Due to confusion about the grant process, we did not get further funds for this project in 2014. We hope to receive funds in 2015 under the new project Integrated Monitoring of Insect Pests in Cereal Crops with Dave Crowder. In this case, we will continue monitoring studies in conjunction with other insects	
b. In subsequent years, if there are hotspots or areas of concern, utilize them to develop a degree-day model for wheat midge development in the state.		A degree day model is crucial for managing the midge, as indicated in the literature about this pest. In 2013, spring wheat at Peone Prairie missed infestation by not being in the early heading stage when the midge population was flying. With the aid of a degree day model, growers should be able to plan spring wheat plantings to avoid the pest.	We were unable to purchase an AWN weather station due to lack of funds. We had technical problems with the one we borrowed, and the project PI (Roberts) was dealing with head injury/concussion issues and not managing detailed things well, so we didn't get any usable weather data this year. Plan to try again in 2015	
c. At hotspots, determine economic thresholds for infestations.		The Peone and Rathrum Prairies remain the primary hotspots for wheat midge, although some sites in Stevens County had a fair number. Spring wheat is not grown much in Stevens County, so numbers might be higher if the traps were in wheat rather than barley fields	We will continue this objective under the Integrated Insect Monitoring Project	
d. At hotspots, determine whether the biocontrol wasp has moved in with the pest.		We contract with Dr. Jan Knodel at NDSU to assay soil samples for midge cocoons (overwintering stage) and biocontrol parasitoids. We sent samples to NDSU in 2013 - several collected from Peone Prairie and some from the Rathdrum Prairie in ID where the infestation warranted spraying (samples were from an unsprayed portion of the field). Cocoons were found in 5 of the 7 samples but numbers were in the low range (about 200/square meter where 1200 would be high risk). Note - pheromone traps draw insects in from across the whole field, so they are not indicative of populations at that point. Samples sent in 2014 have not yet been processed.	We will continue this objective under the Integrated Insect Monitoring Project	

<p>e. Determine whether the biocontrol wasp occurs here already and if not, import it from North Dakota or Canada.</p>		<p>Samples sent in 2014 have not yet been processed</p>	<p>We will continue this objective under the Integrated Insect Monitoring Project</p>	
<p>f. Teach crop consultants and farmers how to use the traps, to survey infested fields, and to identify the midge correctly.</p>		<p>Based on their experience with the cereal leaf beetle, the farmers at Peone Prairie have been eager to cooperate on the project and reluctant to spray for the wheat midge because it would kill any beneficial insects also. Hearing this from them was music to my ears! I have included their crop consultant, Rory Eggers from Primeland, as a collaborator on the project. Working closely with him in this capacity has improved cooperation all round - we have standardized the pheromone traps we use so that it is easier to make comparisons among sites.</p>	<p>I have alerted growers to this potential problem via several presentations in 2011, 2012, 2013, and 2014. Right now I'm focusing education to those farmers/crop consultants who are directly affected by the midge. Will expand outreach as needed as the project develops...</p>	<p>Presentations: Spokane County Crop Improvement Assoc 2010, 2011 & 2012 - 60 growers and consultants each year. WGC Review 2012 & 2013 - 35 participants. each year. Stevens County producers 2010, 2013, and 2014 - 90 participants. Whitman County 2011 - 55 growers & consultants. Lincoln County producers 2012 - 25 growers. In a 2013 WSU Extension survey, 39% of 117 respondents said they had increased their knowledge of the wheat midge and 10% had used our information in making on-farm management decisions.</p>