

**PROJECT NO:** New

**TITLE:** Incidence of Pythium in Southeast Idaho Wheat and Barley Fields

**PERSONNEL:** Jonathon Hogge, Cereals Area Educator, Southeast Idaho  
Juliet Marshall, Ext. Crop Mgmt. Specialist (SC and E Idaho)  
Wayne Jones, Bonneville County Extension Educator

**ADDRESS:** Jonathon Hogge, P.O. Box 580, 134 E Main St. Rexburg ID, 83440;  
208-716-5602; jhogge@uidaho.edu

**JUSTIFICATION:** There is a perennial issue with soil borne diseases such as Rhizoctonia and Pythium in Idaho cereal fields. These pathogens cause various root issues (such as bare patch or Rhizoctonia root rot and Pythium seed and seedling rots), which are so prevalent in dry land continuous grain situations that growers have come to accept associated losses as the norm. In the spring of 2016, stand of spring sown wheat was reduced over 80% in fields near Ririe, ID following herbicide application on volunteer winter wheat immediately prior to planting. In an irrigated field of barley planted with certified seed (with seed treatment) near Springfield, ID, reduced tillering of plants and yellowing occurred in patches. Subsequent isolations of roots revealed Pythium infection. Evidence suggests that current fungicide seed treatments may not be efficacious. Thus far the producer's most effective tool to manage these soil borne pathogens are seed treatments containing mefenoxam. There have been recent reports of a loss of efficacy of these products. In a study from Dangi, et al, 2016, those Pythium isolates from the symptomatic root samples of barley were tested using the spiral plate method to evaluate mefenoxam resistance. Most of the isolates were found to be insensitive to the mefenoxam.

The focus of this study is to determine the potential degree of distribution and percentage of isolates with fungicide resistance of Pythium. We have concern that the amount of pathogen damage is underestimated in many areas of cereal production.

Our objective is to determine the prevalence of Pythium root disease in our production system and resistance to mefenoxam. We will test the newly available etaboxam seed treatment fungicide for the ability to reduce Pythium infection in the growth chamber or greenhouse.

#### **HYPOTHESIS & OBJECTIVES:**

- 1) Our hypothesis is that Pythium causes loss of plant stand, tillering, and yield for many producers in Southeast Idaho, especially where continuous dry land cereal production occurs.
- 2) We will test the isolates recovered to determine their resistance to the seed treatment chemical mefenoxam using the spiral plate method.
- 3) Mefenoxam resistant isolates will be tested in the growth chamber or greenhouse against the newly released seed treatment etaboxam.

**PROCEDURES:** Approximately sixty fields in southeast Idaho will be sampled by obtaining plants with apparent root damage. Appropriate records will be maintained to identify the general area in which the samples were taken. Sampling will take place in most of the 16 southeast

counties, ranging from Custer to Caribou. The samples will then be taken to the lab to estimate symptoms and make isolations from symptomatic plants. Once isolates are obtained they will be tested for resistance to mefenoxam using the spiral plating technique.

**DURATION:** One.

**Anticipated Benefits and Information Transfer:** All results will be available to growers at Cereal Schools. One year of data from approximately sixty locations will provide information for a Disease Note. One CIS will also be developed explaining the results of this study.

#### **LITERATURE REVIEW:**

Cook R.J. 1980. Fusarium foot rot of wheat and its control in the Pacific Northwest. AR-SEA-USDA, Pullman, Washington, USA. Plant Disease 1980 Vol.64 No.12 pp.1061-1066 ref.14

Dangi, S., Woodhall, J., Fairchild, K.L., Marshall, J.M., and Wharton, P.S. 2016. Detection of mefenoxam resistance in *Pythium ultimum* on barley in Southern Idaho. Proceedings of the 9<sup>th</sup> Australasian Soilborne Diseases Symposium. Lincoln University, Christchurch, New Zealand. Nov 14-17, 2016.

Ingram, D.M. and Cook, R.J. 1990. Pathogenicity of four *Pythium* species to wheat, barley, peas, and lentils. *Plant Pathology*. 39: 110–117.

Paulitz, T.C., Smiley, R.W. and R. James Cook, R.J. April 2010. Insights into the prevalence and management of soil borne cereal pathogens under direct seeding in the Pacific Northwest, U.S.A. *Canadian Journal of Plant Pathology*.

Paulitz, T.C., J. D. Smith and K. K. Kidwell. January 2003. Virulence of *Rhizoctonia oryzae* on Wheat and Barley Cultivars from the Pacific Northwest. January 2003, Volume 87, Number 1. Pages 51 - 55.

Porter, L.D., Hamm, P.B, David, N.L., Gieck, S.L., Miller, J.S., Gunderson, B., and Inglis, D. 2009. Metalaxyl-M-Resistant *Pythium* Species in Potato Production areas of the Pacific Northwest of the U.S.A. *Am. J. Pot. Res.* 86:315-326.

**IDAHO WHEAT COMMISSION - BUDGET FORM**

Allocated by Idaho Wheat Commission during FY 2016 \$ -

Allocated by Idaho Wheat Commission during FY 2017 \$ -

**REQUESTED FY2018 SUPPORT:**

|                        | Salary | Temporary Help | Fringe | Travel   | OE       | Graduate Tuition/Fees | TOTALS |
|------------------------|--------|----------------|--------|----------|----------|-----------------------|--------|
| Idaho Wheat Commission | \$ -   | \$ 2,400       | \$ 961 | \$ 2,573 | \$ 8,845 | \$ -                  | 14,779 |

**TOTAL BUDGET REQUEST FOR FY 2018:** \$ 14,779

**BREAKDOWN FOR MULTIPLE SUB-BUDGETS:**

|                               | <i>J. Hogge</i> | <i>J. Marshall</i> | <i>W. Jones</i> | (PI name) |
|-------------------------------|-----------------|--------------------|-----------------|-----------|
| Salary                        | \$ -            | \$ -               | \$ -            |           |
| Temporary Help                | \$ -            | \$ 2,300           | \$ 100          |           |
| Fringe Benefits               | \$ -            | \$ 941             | \$ 20           |           |
| Travel                        | \$ 1,523        | \$ 750             | \$ 300          |           |
| Operating Expenses            | \$ 7,345        | \$ 1,500           | \$ -            |           |
| Graduate Student Tuition/Fees | \$ -            | \$ -               | \$ -            |           |
| <b>TOTALS</b>                 | \$ 8,868        | \$ 5,491           | \$ 420          |           |
| <b>Total Sub-budgets</b>      |                 |                    |                 | \$ 14,779 |

**Explanatory Comments:** (see FY2018 Guidelines for definition)

11.21.2016 - Version