

## Project Abstract

<b>Project Title:</b>	Conventional and marker-based breeding to improve yield and FHB resistance in wheat	
<b>Principal Investigator:</b>	Mohsen Mohammadi	Purdue University

The ultimate goal of VDHR is to develop high yielding soft red winter wheat varieties that are resistant to head scab disease of wheat. Increasing grain yield while enhancing resistance to FHB disease and less accumulation of DON is difficult and the genetic gains for increasing yield and resistance are slow. We accomplish this goal by three objectives:

**Creating new breeding lines and introducing genetic diversity:** We will do ~200 crosses between high yielding and moderately resistant germplasm per year. The segregating generations (F2-F4) will be advanced in the field by bulk methods. Single heads will be collected, and planted in head-row nursery for line extraction. The expected outcomes will be about 1000 of new lines every year that will be tested for stage-1.

**Line testing:** This objective includes stage-1, stage 2, advanced, and elite testing of lines in the program, which identifies high yielding lines for multi-state tests and potential release. In addition, we will cooperate with other states for 5-State and the uniform eastern trials. The expected outcomes will be lines that will be identified for release as new varieties and data sharing among the breeding program for informed selection.

**Scab testing:** This objective includes FHB testing of the elite and advanced nursery under artificially inoculated and misted irrigation system to ensure the high yielding lines are also equipped with the FHB disease resistance package. In addition, we grow the regional P/NUWWSN nursery under misted irrigation system in replicated row plots and evaluate their scab resistance. The expected outcomes will be data that shows the levels of resistance or susceptibility of the lines and data sharing among the breeding program for informed selection.