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PROJECT 3 ABSTRACT

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Host resistance to *Fusarium* head blight disease in soft red winter wheat germplasm is controlled by few native and exotic QTL that are segregating among various breeding populations. Coordinated Phenotyping of Uniform Nurseries and Official Variety Trials are tools of cross-talk among various breeding populations which serve the two following purposes by evaluating breeding germplasm in several environments:

- The extent to which a QTL or a genotype is effective against *Fusarium* disease under diverse environment can be evaluated, which will lead to a better understanding of the potency of the QTL and will result in a better-informed breeding decision and selection. This will be possible by field-based evaluation of FHB response and laboratory characterization of DON content.
- Breeders of various states will have a chance to always cross-reference the performance of their breeding populations with representative breeding lines of other breeding programs. This observation, may lead to germplasm exchange (based on mutual agreement or signing of material transfer agreement between institutions) and gene flow among breeding populations.

We collaborate with other breeding programs in coordinated trials to obtain regional data for decision making on overall adaptation, yield stability, and FHB response. More specifically, the Uniform Eastern and Southern Regional Winter Wheat Nurseries (UESRWWN), the 5-States (5ST) preliminary and advanced yield trials, and the coordinated P+NUWWSN trials are the nurseries that we planted in West Lafayette in replicated trials that will be tested for *Fusarium* head blight resistance under artificial inoculation and misting system. The expected outcome would be informed decision making in line selection using replicated data from multiple environments.