



2022 Grant Recipient

Principle Investigator Name: Amber Hauvermale

Academic Institution: Washington State University

Project Title: Tools to enhance rapid testing platforms for wheat α -amylase detection.

Project Intro: Accurate, rapid, and reliable testing platforms are essential for early detection and mitigation of late maturity α -amylase (LMA) and preharvest sprouting (PHS). LMA and PHS are two genetic conditions in wheat characterized by high α -amylase expression resulting in negative impacts to flour end-use quality, and substantial profit losses for those participating at every level of the grain industry. The Falling numbers test (FN) is the entrenched industry standard for measuring α -amylase in milled flour. However, FN is slow and expensive to operate, has high run-to-run variability, and is unable to directly detect α -amylase. Ongoing efforts at WSU have resulted in improved enzyme activity assays for α -amylase detection, and novel immunoassays currently being evaluated for commercialization. These rapid tests are intended to directly detect and quantify α -amylase active and protein levels in wheat samples, and to provide faster, more accurate and cost-effective alternatives to the FN test. However, test accuracy and performance are limited by 1) the absence of a purified wheat α -amylase standards, 2) simple methods that facilitate α -amylase purification from wheat meal that are compatible with diverse testing landscapes (on-farm, elevator, lab, etc.), and 3) greater detection sensitivity, and through-put immunoassays. Therefore, the proposed project will address these challenges by producing a renewable source of the four classes of wheat α -amylases, by developing simple wheat meal purification methods for diverse testing scenarios, and by testing alternative immunoassay methods/consumables specifically for use in 96-well applications.