



## PARTNERS IN PROGRESS

# 2021 WHEAT RESEARCH

Supported by the Oklahoma Wheat Commission and Oklahoma Wheat Research Foundation

The [2021 Partners in Progress Wheat Research Report](#) is a collaborative effort among scientists in the Division of Agricultural Sciences and Natural Resources who specialize in biochemistry, entomology, molecular biology, plant pathology and plant and soil science. These interdisciplinary scientists also serve as members of OSU's Wheat Improvement Team (WIT), which supports the Oklahoma wheat industry through genetic research of winter wheat.

## 2021 WHEAT RESEARCH SUMMARY

- [Wheat variety development](#) by OSU WIT produced five of the top six varieties planted for Oklahoma's 2021 crop. These varieties remain the gold standard in the southern plains for disease resistance, end-use quality and yield potential.
- [Variety testing and information exchange](#) provided stakeholders with timely and non-partisan results on adaptation and protein levels for nearly 60 wheat varieties currently in or eventually coming to the marketplace.
- [Herbicide tolerance and weed management](#) research demonstrated Clearfield Plus and CoAXium production systems are effective at controlling feral rye but miss Italian ryegrass populations found to carry multiple resistance to ALS (Beyond) and ACCase (Axial and Aggressor) sites of action.
- [Wheat pathology](#) research enabled the identification of reliable sources of resistance against multiple Oklahoma diseases, particularly leaf rust, such that 80% of OSU elite germplasm possesses highly effective resistance to leaf rust and stripe rust.
- Entomologists on OSU WIT have produced novel germplasm with [bird-cherry oat aphid](#) tolerance with the ability to sustain less than 6% yield reduction in the presence of unusually severe aphid pressure in the field.
- [Adaptive introgression research](#) focused on discovery and incorporation of novel resistance genes for leaf rust, powdery mildew and greenbug utilizing germplasm across the world. This pre-breeding effort fortifies the germplasm base of the WIT variety development pipeline.
- [Gene discovery and genomic applications](#) revealed a new genetic basis for flowering time and maturity differences in hard winter wheat and the genetic cause of wheat seedling death.
- [Nitrogen-use efficiency](#) studies were expanded to include more rapid phenotyping among varieties during early vegetative stages to unveil genetic differences in response to nitrogen deficiency.
- Oklahoma's Unmanned Aerial Vehicle (UAV) Platform continues to improve and expand for multi-trait phenotyping under varied climatic conditions.



For the full report, visit [agresearch.okstate.edu/research/wheat-report](https://agresearch.okstate.edu/research/wheat-report)