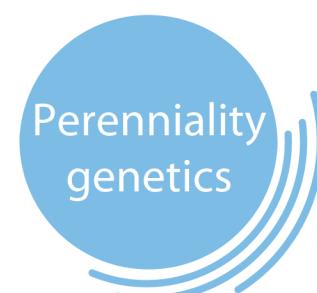


# Timeline of Dorn Lab Projects

## 2019-2023      2024-2028      Long Term Goals



Perennial Agriculture Project  
- Dissecting the genetic basis of key domestication traits in Kernza  
- Pan-genomic characterization of Kernza germplasm  
- Functional genomics of major domestication genes

NSF-PGRP  
- Systems exploration of hybrid perennial wheat regrowth  
NSF-EDGE  
- Establishing a functional genomics platform for perennial Triticeae crops

USDA-AFRI  
- Advancing approaches to identify resistance genes against wheat streak mosaic virus  
- Establishing high-quality, pan-genomic resources for wild wheat relatives to drive disease resistance breeding

USDA-AFRI  
- Local infrastructure/pipeline for rapid sequencing & genome assembly for new species and associated genotyping platforms

USDA-AFRI  
- Genomic and phenotypic effects of neo-domestication on yield traits in perennial grain crops

Perennial Agriculture Project  
- Candidate gene testing of perenniality gene networks  
- In-field evaluation of next generation perenniality traits in wheat

USDA-AFRI  
- In-field testing of next-generation disease resistance traits in wheat

Operational pipeline for USDA, CSU, and external collaborators for sequencing, assembly, and genotyping

- Direct markers for critical Kernza genes underlying domestication and agronomic traits  
- High efficiency transformation system in perennial Triticeae species for functional genomics  
- Pan-genome characterization and associated species-wide expression databases driving breeding

- Candidate genes/cassettes for engineering 'true' perenniality in annual crops  
- Working model for network-level differences between perennial and annual grasses  
- Establish multi-environment field testing of perennialized bread wheat

- Candidate genes for wheat streak resistance  
- Candidate genes for R genes from *Thinopyrum* spp.  
- Implement rapid ID from genotyping data of new R genes in breeding programs  
- Well-characterized, minimal size alien introgressions and corresponding single-gene/multi-gene cassettes in transgenic lines for deployment

- Draft genome assemblies for all minor crop species and wild relatives in USDA collection  
- High density marker sets for all accessions in collection  
- New focus on 2+ additional rotational / minor crops for Colorado production systems

