



K-State Wheat Breeding Program: Breeding for Organic Systems

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Disease Resistance

- Long-term effort on race non-specific rust resistance
 - Increasing frequency of alleles for RNS resistance
 - KS090049K-8
 - KS061470M-4
- FHB resistance
 - Everest, Zenda

Disease Resistance

- BYDV
 - Everest, *Bdv2*, *Bdv3*
- SBMV, Acid Soil Tolerance
- WSMV
 - Pyramiding of *Cmc4*, *Wsm2*



Allelopathy

- Dr. Anita Dille is leading an undergrad research project on allelopathy
- Could be part of weed management
- Some varieties already reported as allelopathic, but most evidence is anecdotal

Use of Wild Relatives

- Germplasm development program using *Aegilops tauschii* and *Triticum dicoccoides*
 - Ancestors of common wheat
 - *Ae. tauschii*-derived lines in yield testing
 - About 150 lines derived from *T. dicoccoides* in field in 2019
 - More materials in the pipeline



cimmyt.org



Peleg et al., 2011

Protein Content

| | pro | yield | TW | # pro/ac | Recurrent Parent | <i>Ae. tauschii</i> |
|-----------------|------|-------|------|----------|------------------|---------------------|
| KS15SGDCB087-16 | 15.3 | 68.3 | 61.1 | 636 | KanMark | TA 1642 |
| KS15SGDCB087-17 | 13.1 | 65.4 | 61.8 | 527 | | |
| | | | | | | |
| KS15SGDCB090-11 | 16.0 | 60.8 | 60.2 | 584 | KanMark | TA 2378 |
| KS15SGDCB090-5 | 13.5 | 64.6 | 60.7 | 529 | | |
| | | | | | | |
| KS15SGDCB093-17 | 15.2 | 65.3 | 61.3 | 608 | KanMark | TA 2388 |
| KS15SGDCB093-23 | 13.3 | 72.9 | 59.6 | 578 | | |
| | | | | | | |
| KS15SGDCB095-2 | 16.2 | 57.0 | 60.9 | 560 | KS061278M-4 | TA 2395 |
| KS15SGDCB095-4 | 13.8 | 59.0 | 61.4 | 498 | | |
| | | | | | | |
| KS15SGDCB103-19 | 15.6 | 71.8 | 60.4 | 674 | KS061406LN-26 | TA 2567 |
| KS15SGDCB103-6 | 13.3 | 79.6 | 60.7 | 640 | | |



Other Potential Traits

- Antioxidant capacity
- Iron and Zinc
- Flavor?
- Functionality?
- Disease resistance

Potential Dwarfing Gene

- PI 415150 is same height as semi-dwarf varieties
- Also has a 9 cm coleoptile
- BC1 materials growing in the greenhouse
- Very, very preliminary
- Could be component of competitiveness for weed suppression