Optimizing harvest timing of Kernza®

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Kernza Harvest Challenges

• Seeds mature at different rates along a spike
  • Seed size differences along a spike
  • Moisture differences along a spike
  • Shattering occurs
Kernza Harvest Challenges

• Objectives
  • Grain filling rate
    • GDD requirements for physiological maturity
  • Grain drying rate
    • GDD requirements for safe harvest/storage moisture
  • Seed shatter rate
  • Quantify variation in seed maturation along length of spike
  • Optimum harvest timing
Kernza Harvest Challenges

• Sample spikes every 3-5 days from the start of grain filling to senescence.

• Study conducted at St. Paul, Minnesota (SP), Kansas (KS), Wisconsin (WI), and New York (NY).

• Two stand ages, with and without plant growth regulators (WI and MN only)
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Data Collected

- Number of spikelets per fraction
- Number of florets per spikelet
- Fraction of florets with seeds (floret utilization; i.e. pollination success, seed abortion)
- Seed mass (dry weight basis)
- Seed moisture
Kernza Seed Mass

Average individual seed mass (mg)

Growing Degree Days

Spike Section
- Bottom
- Middle
- Top
Kernza Seed Moisture

Seed moisture content vs. Growing Degree Days

Spike Section:
- Bottom
- Middle
- Top
Kernza Seed Moisture

Seed moisture content vs. Growing Degree Days

Spike Section
- Bottom
- Middle
- Top

13%
Kernza Spike Yield

Location
- KS
- NY
- SP
- WI

Seed mass per spike (g)

Growing Degree Days

X

0.41 g

0.40 g
Conclusions

• Harvest grain close to physiological maturity – 2300 GDD

• Waiting to harvest grain at safe moisture content could result in 30 kg ha\(^{-1}\) yield penalty

• Whole spike moisture is a good indicator of seed moisture
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Questions?
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