

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

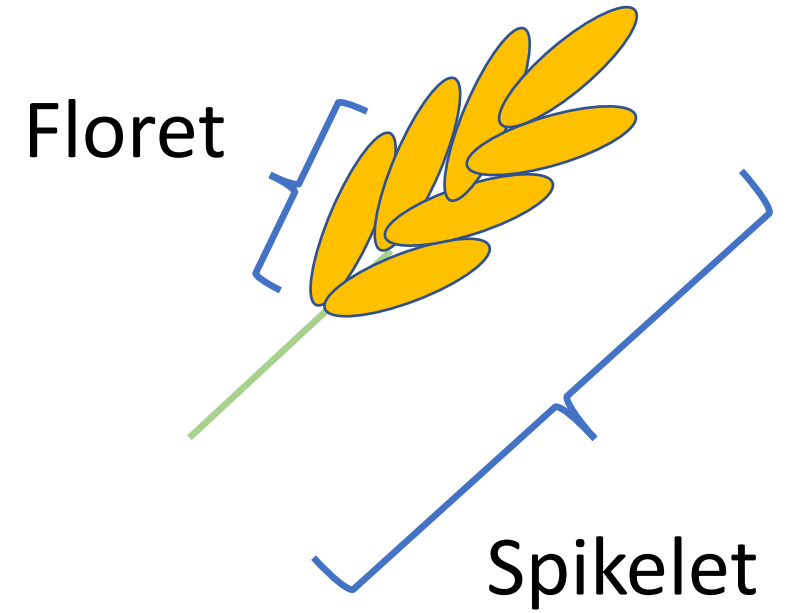
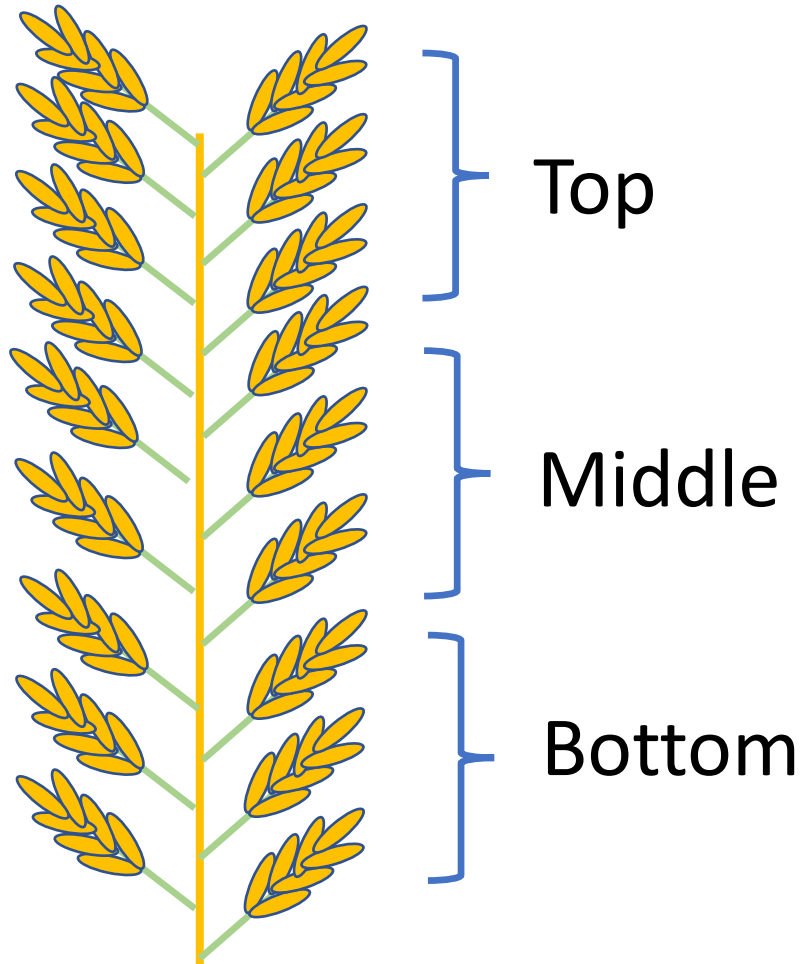
Kernza Harvest Challenges

- 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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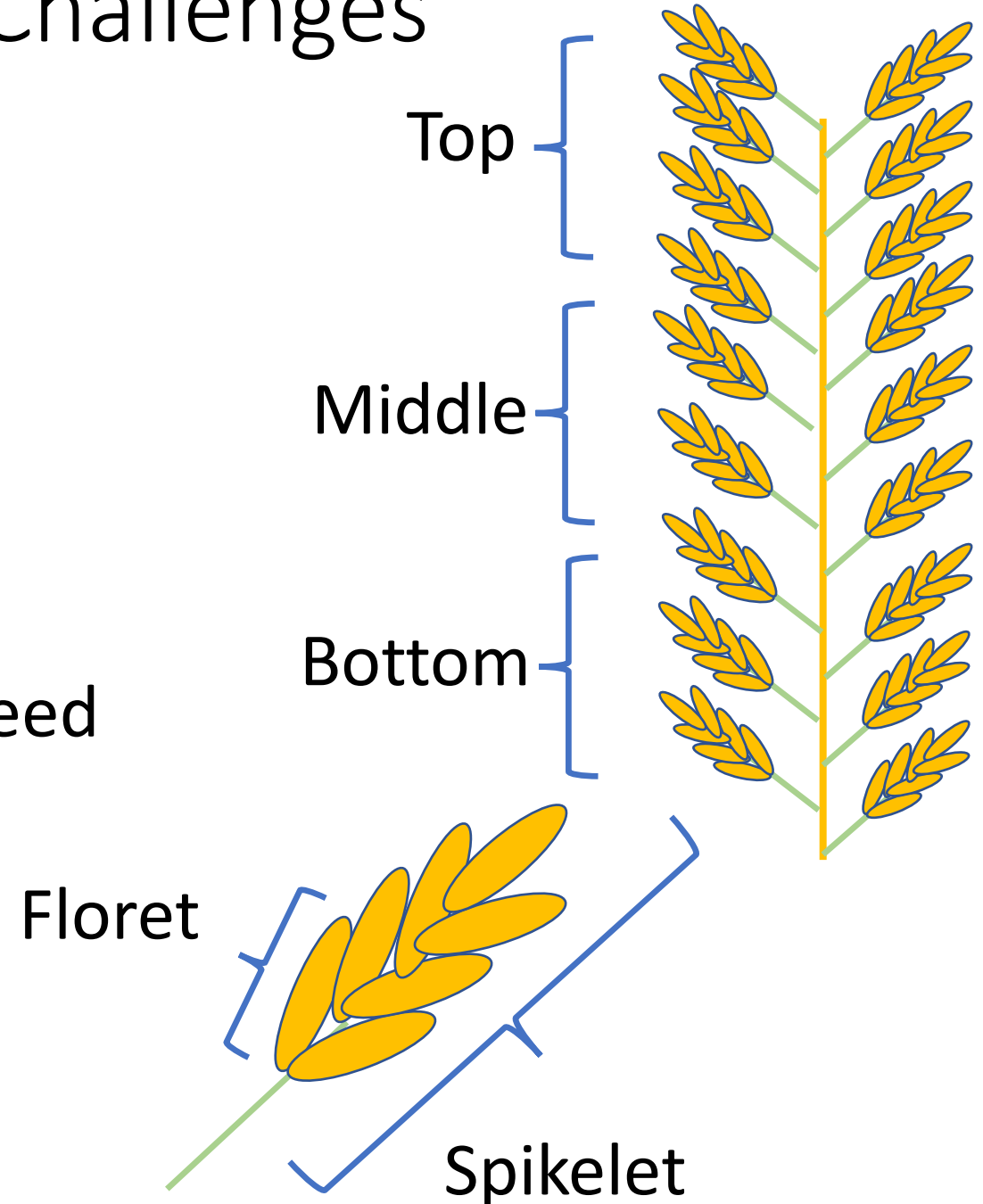
Kernza Harvest Challenges



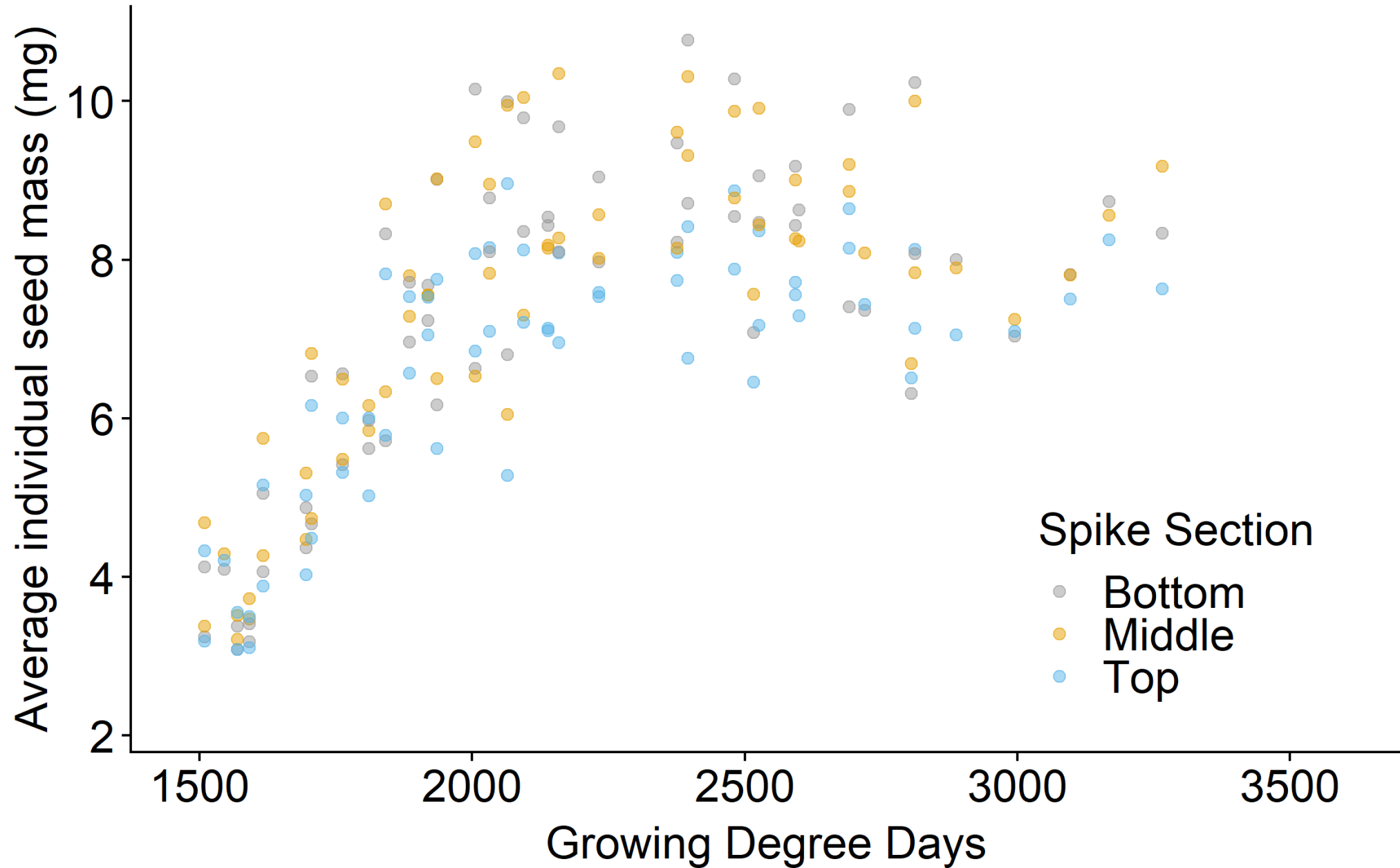
Kernza Harvest Challenges

- Data Collected

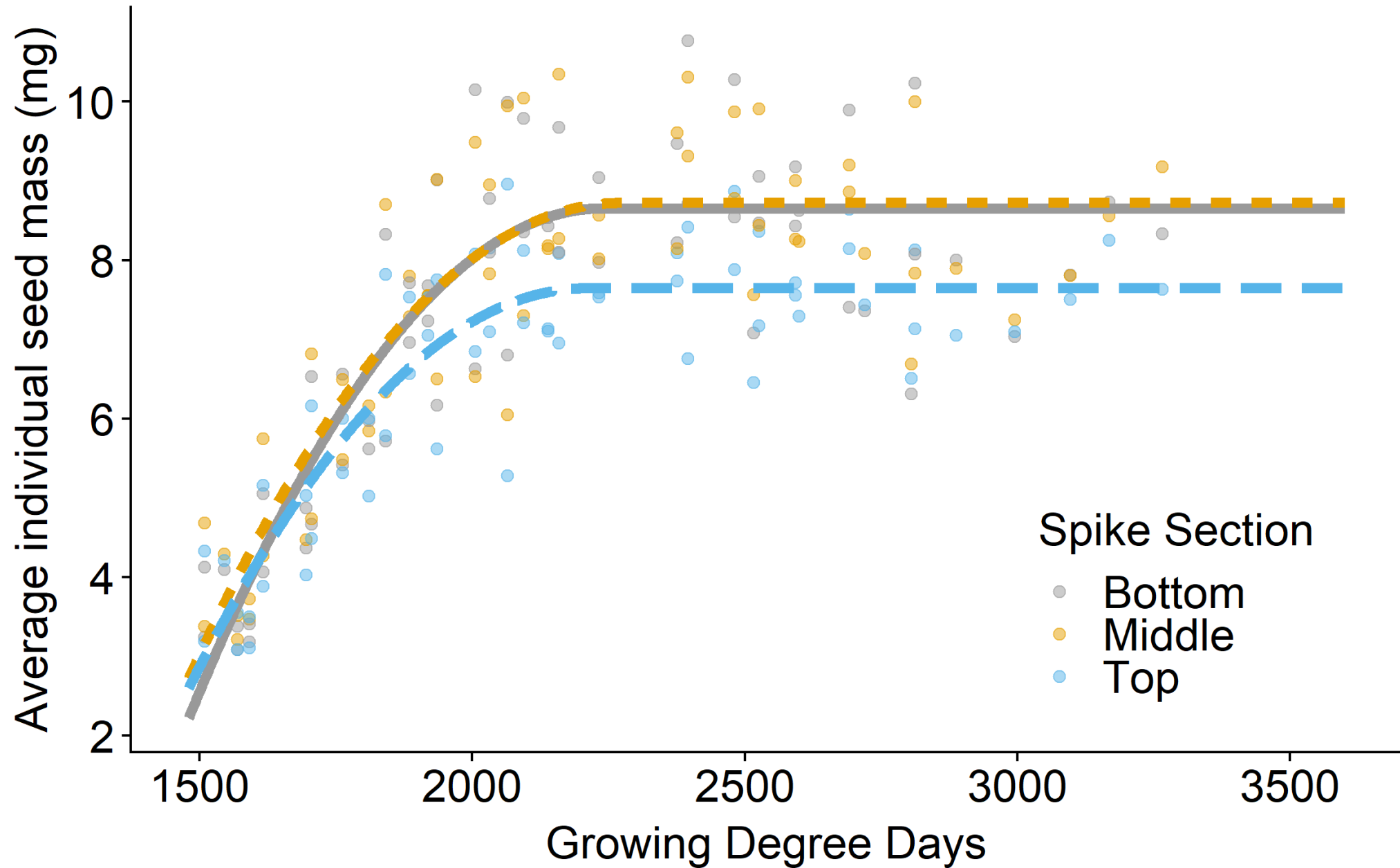
- Number of spikelets per fraction
- Number of florets per spikelet
- Fraction of florets with seeds (floret utilization; i.e. pollination success, seed abortion)
- Seed mass (dry weight basis)
- Seed moisture



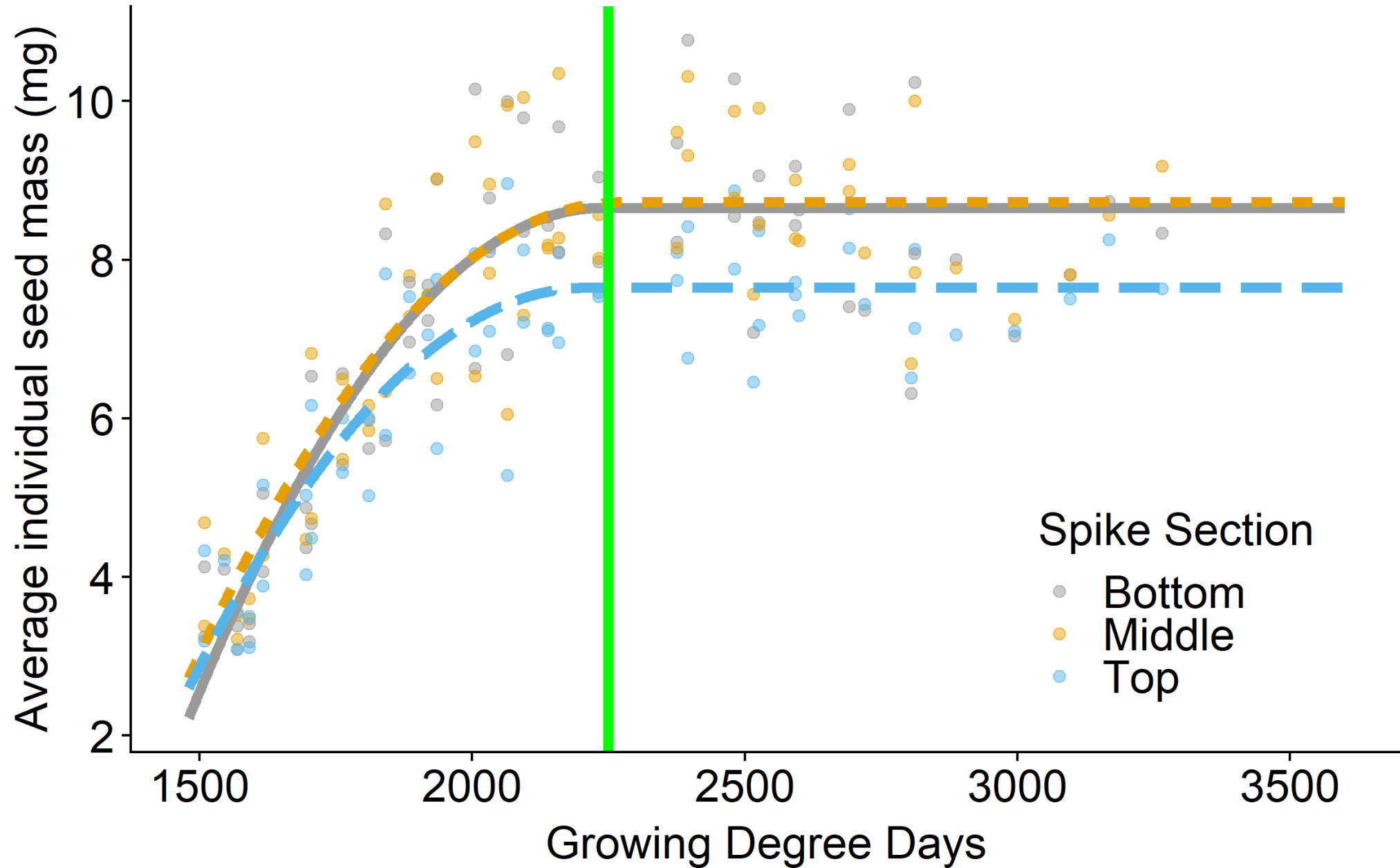
Kernza Seed Mass



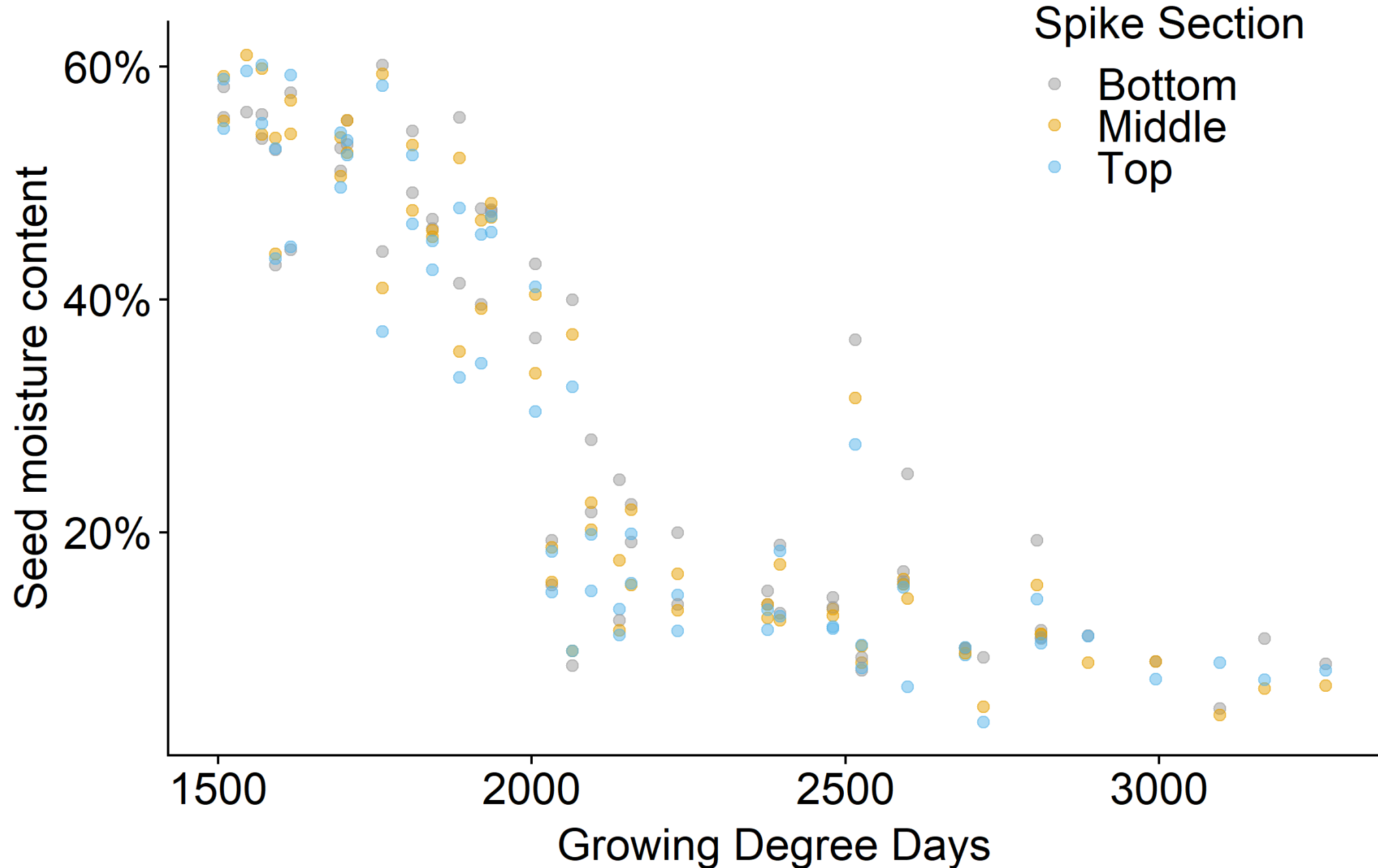
Kernza Seed Mass



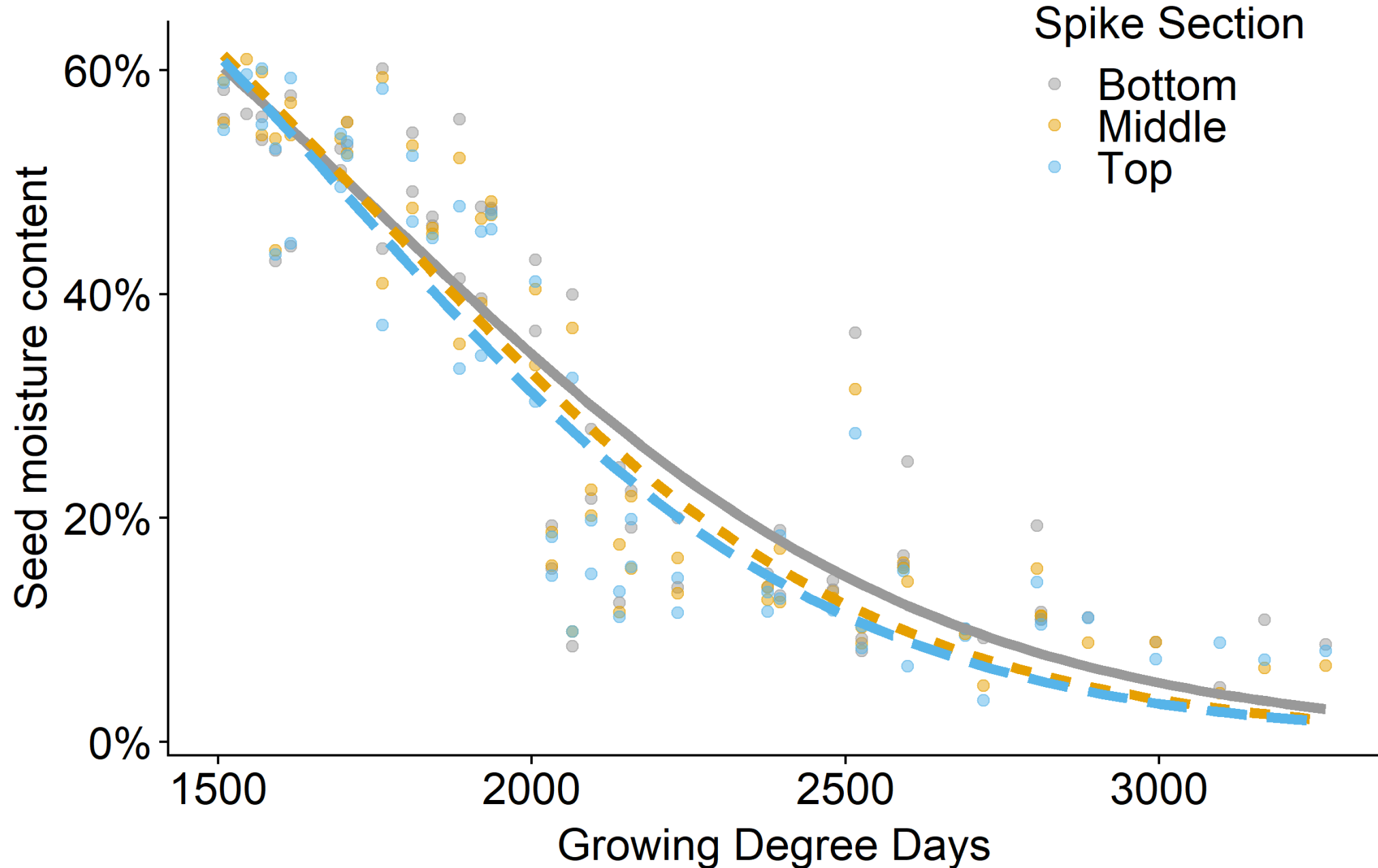
Kernza Seed Mass



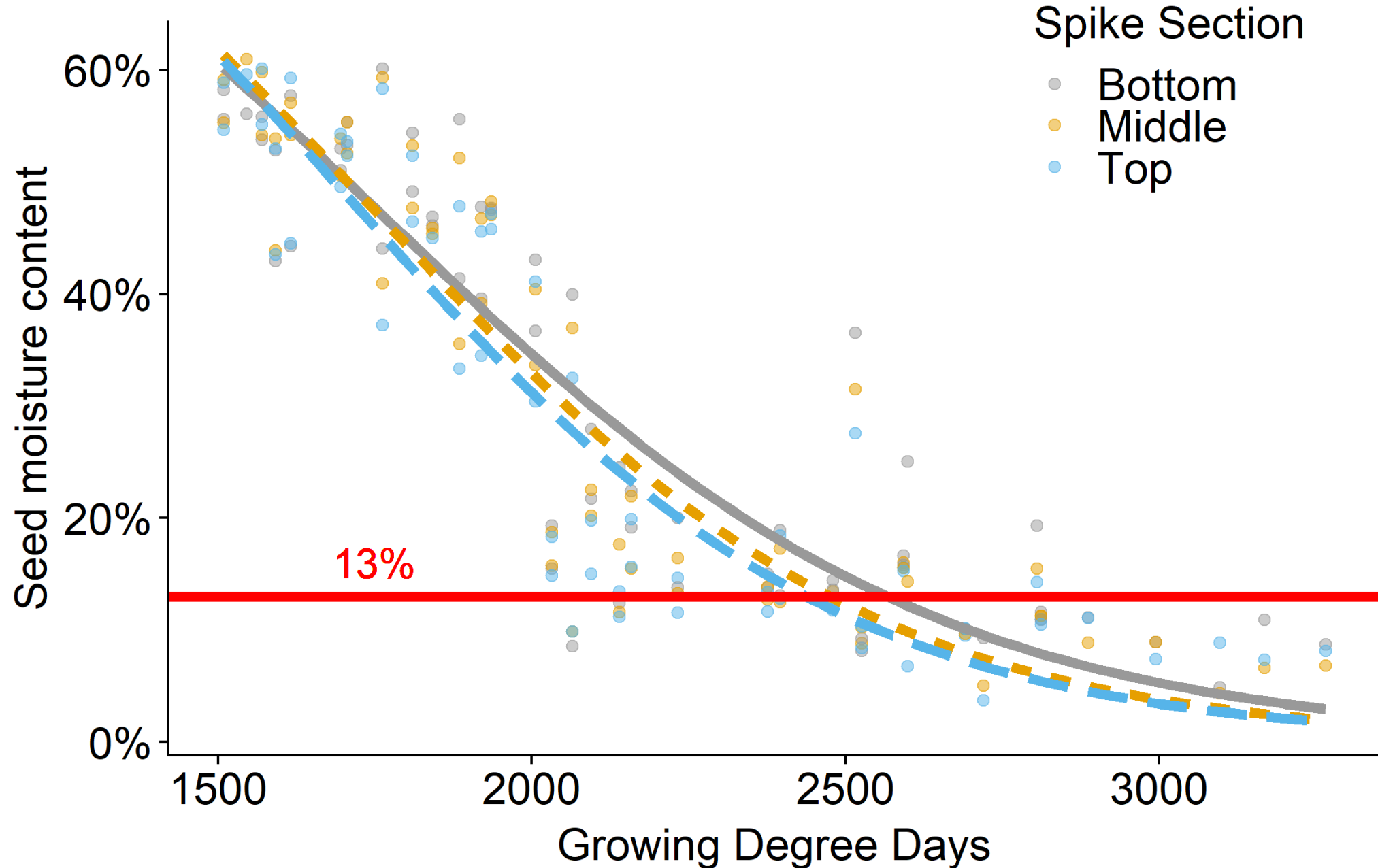
Kernza Seed Moisture



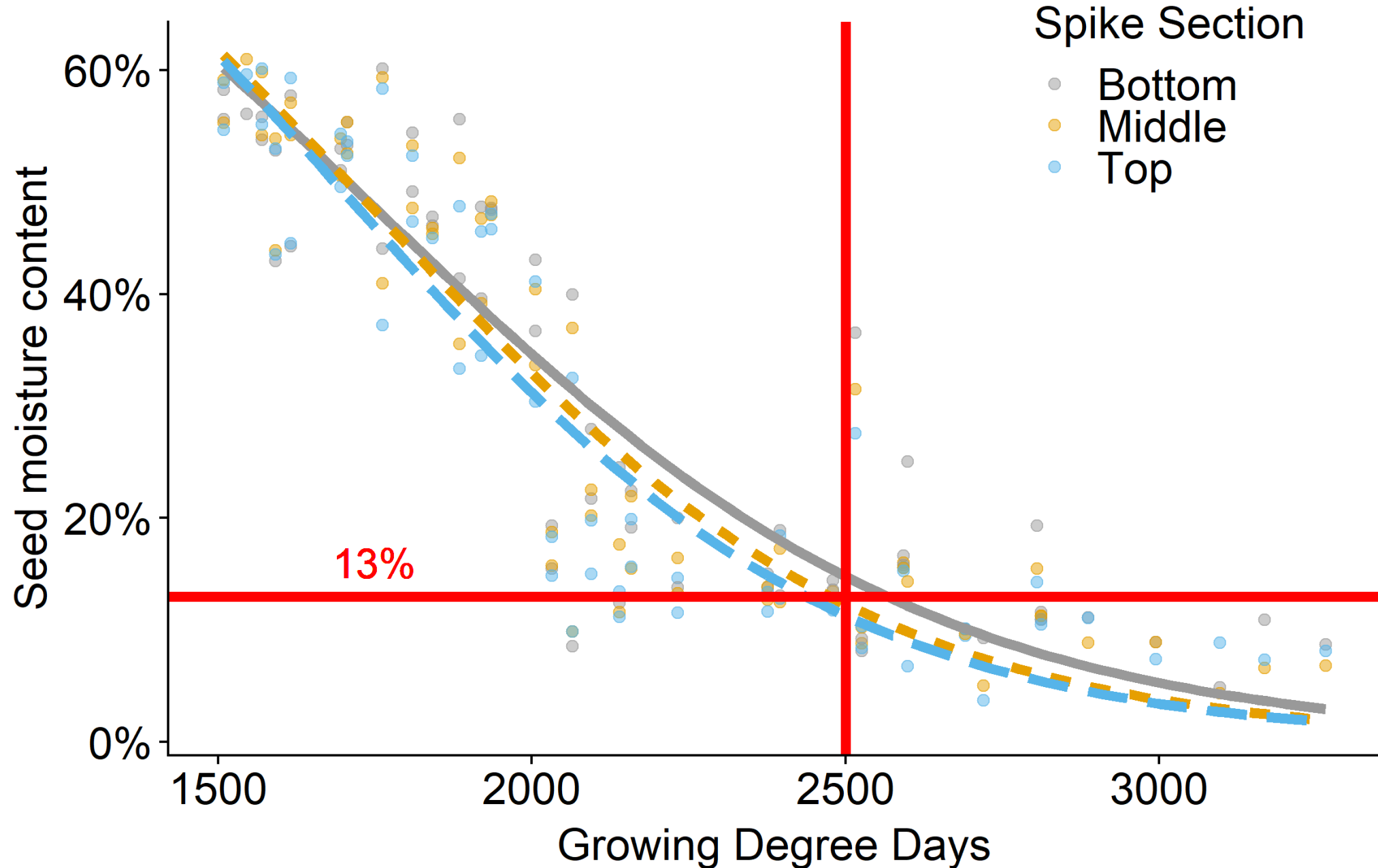
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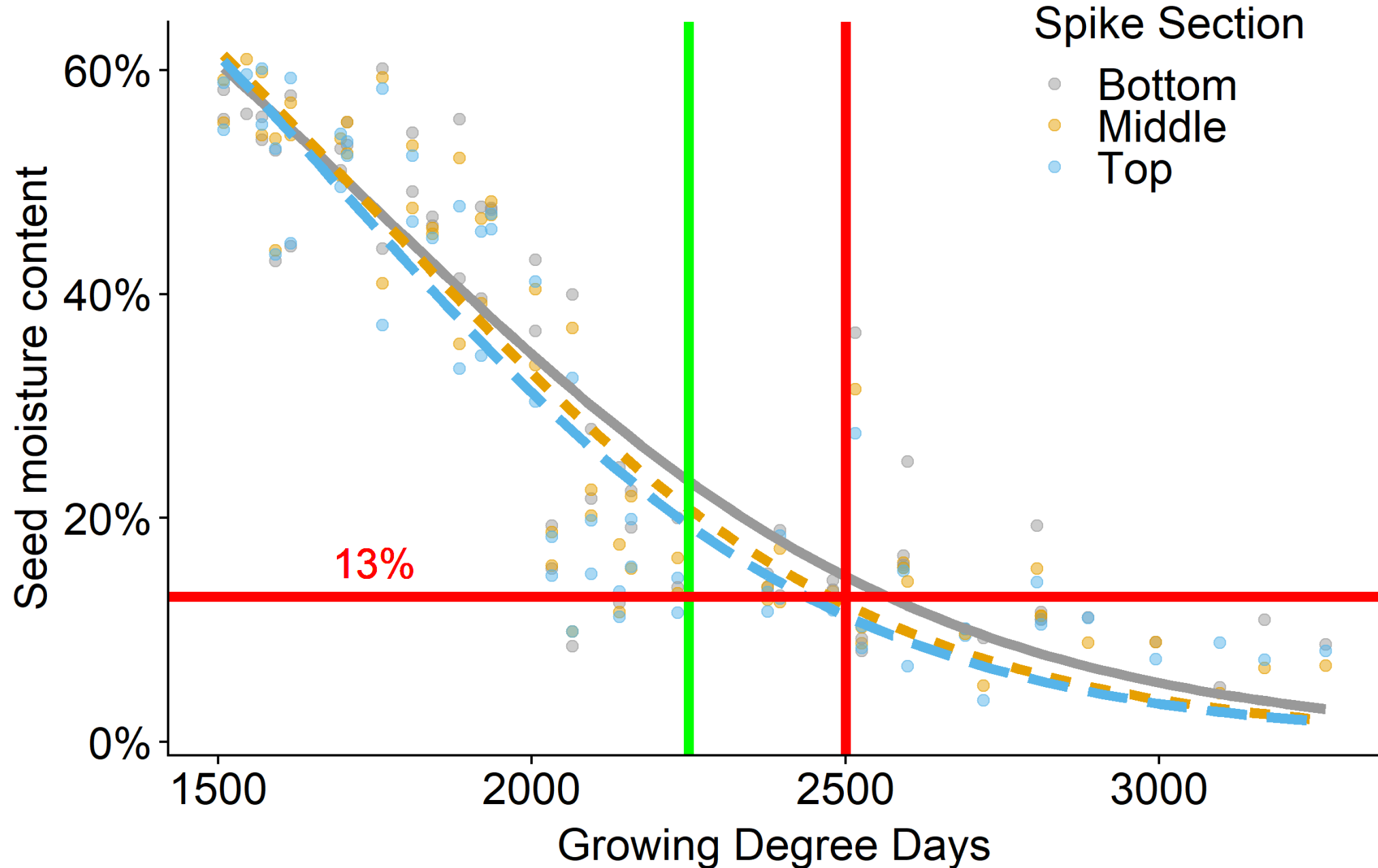
Kernza Seed Moisture



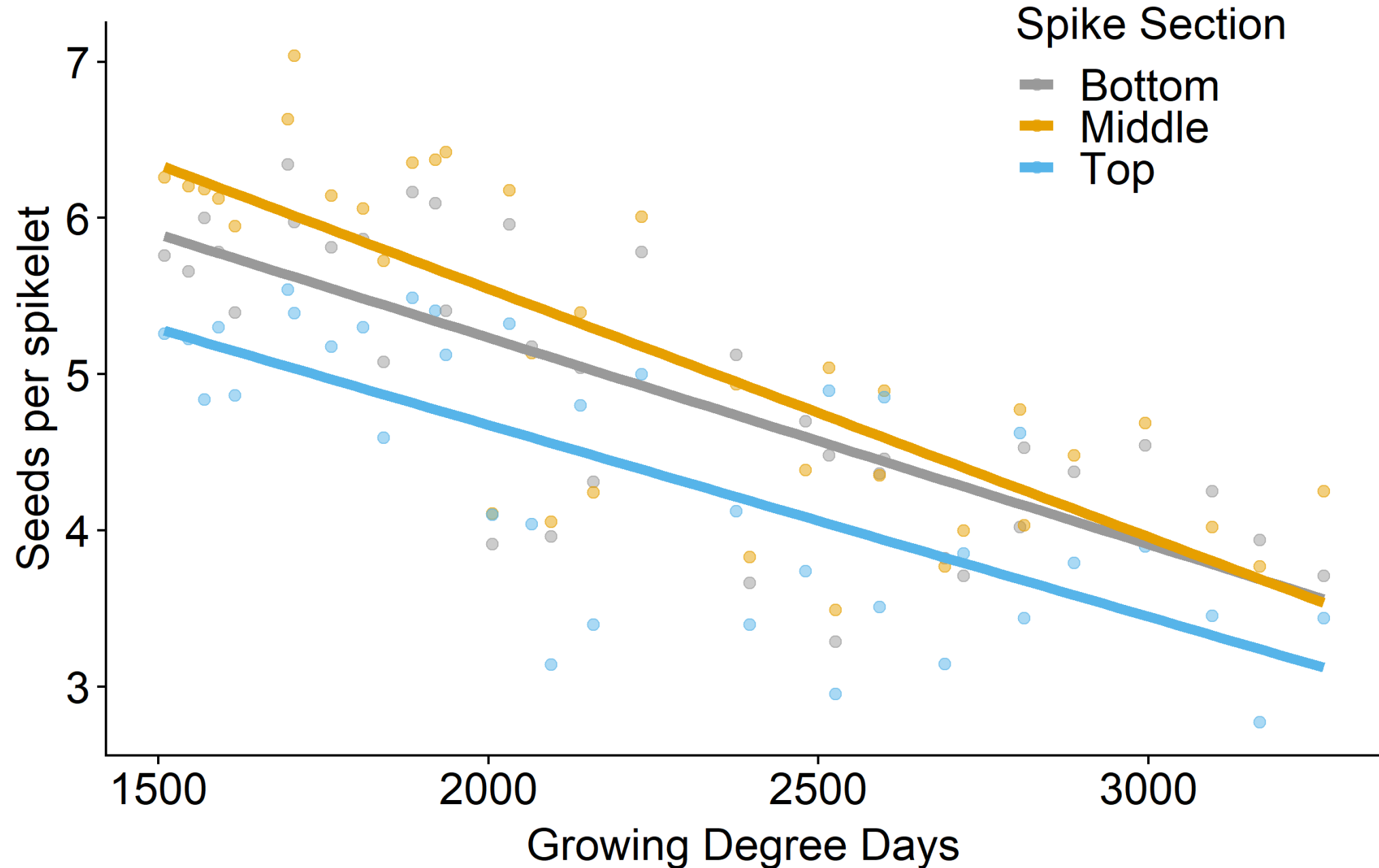
Kernza Seed Moisture



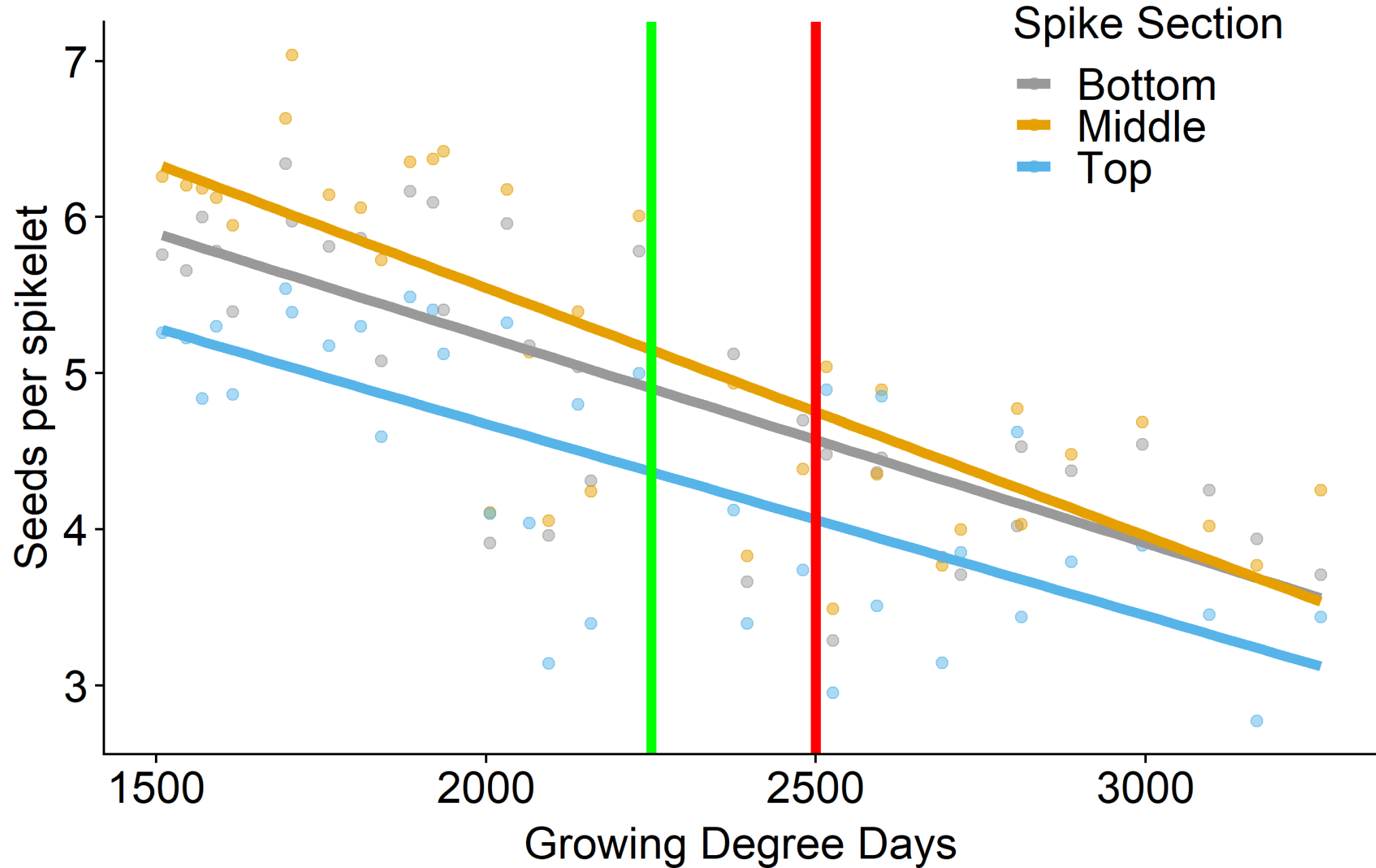
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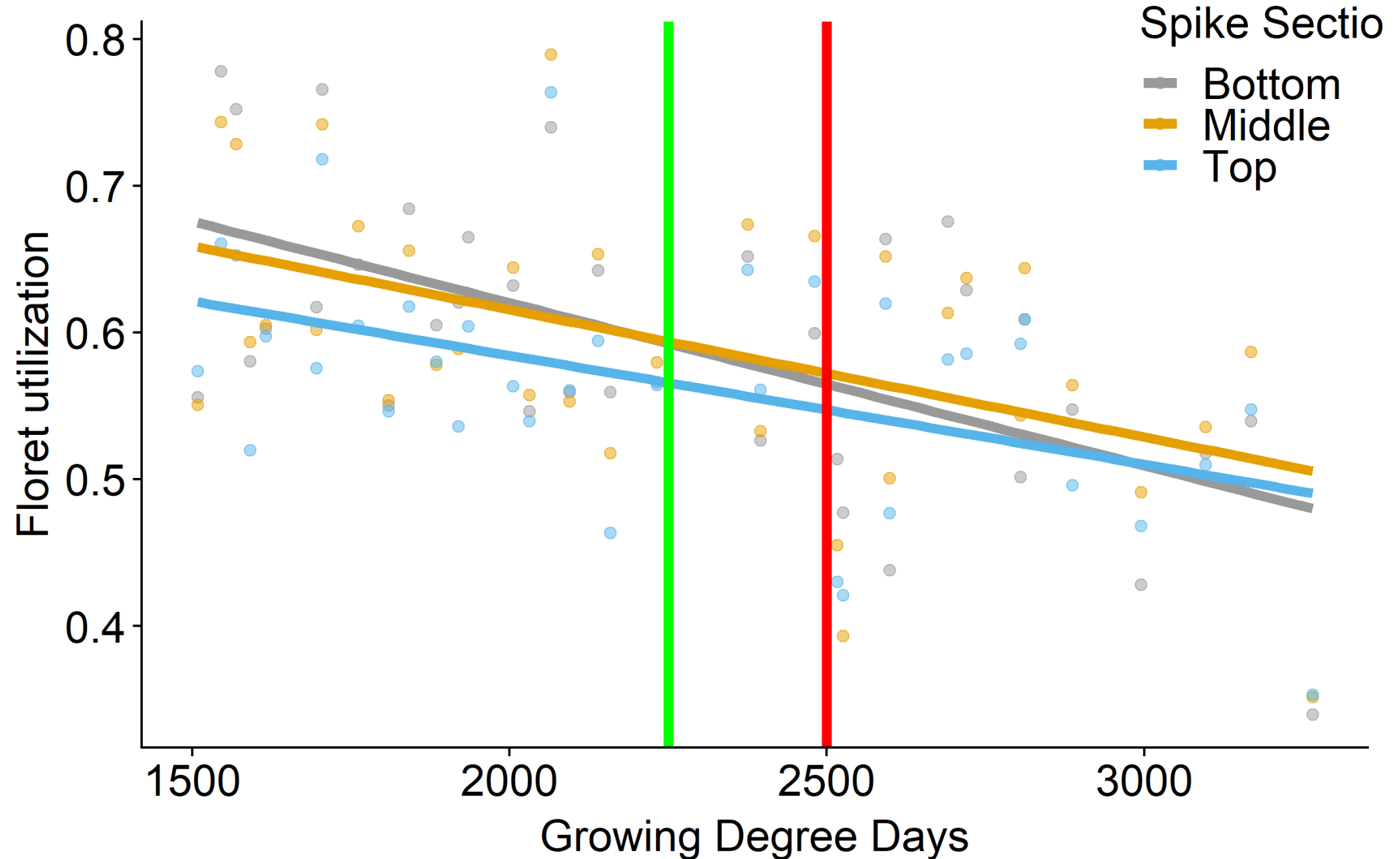
Kernza Seed Shatter



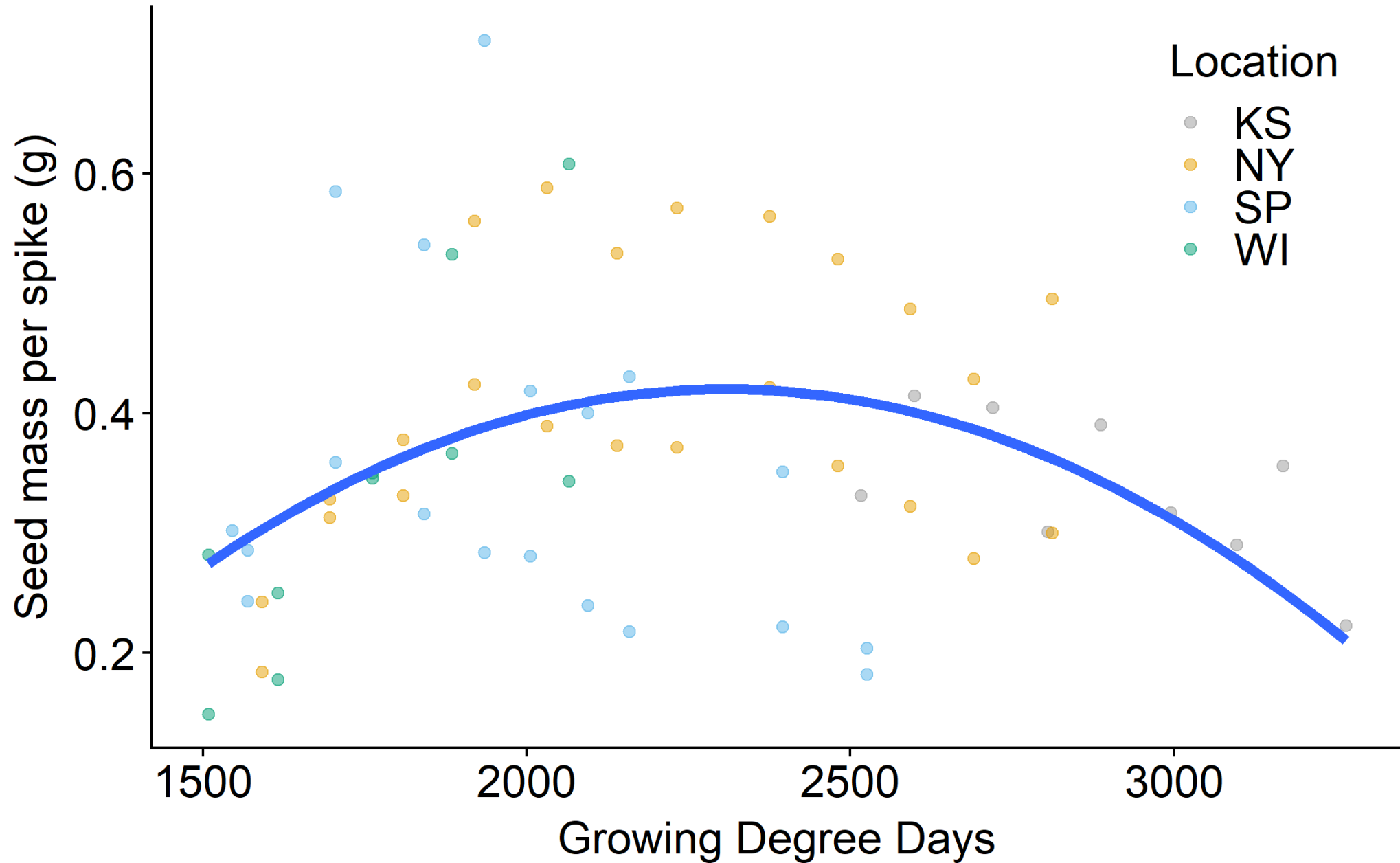
Kernza Seed Moisture



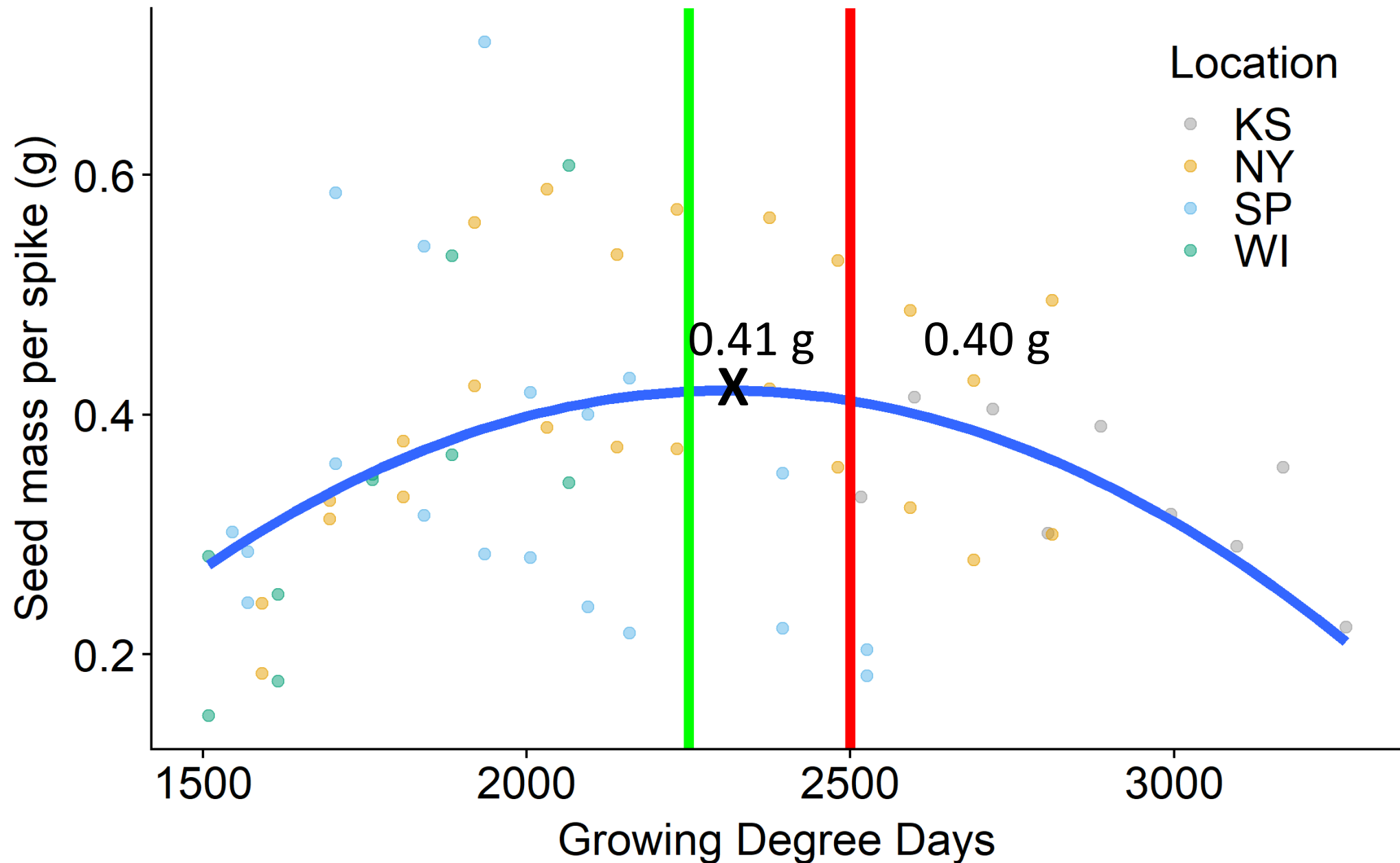
Kernza Floret Utilization



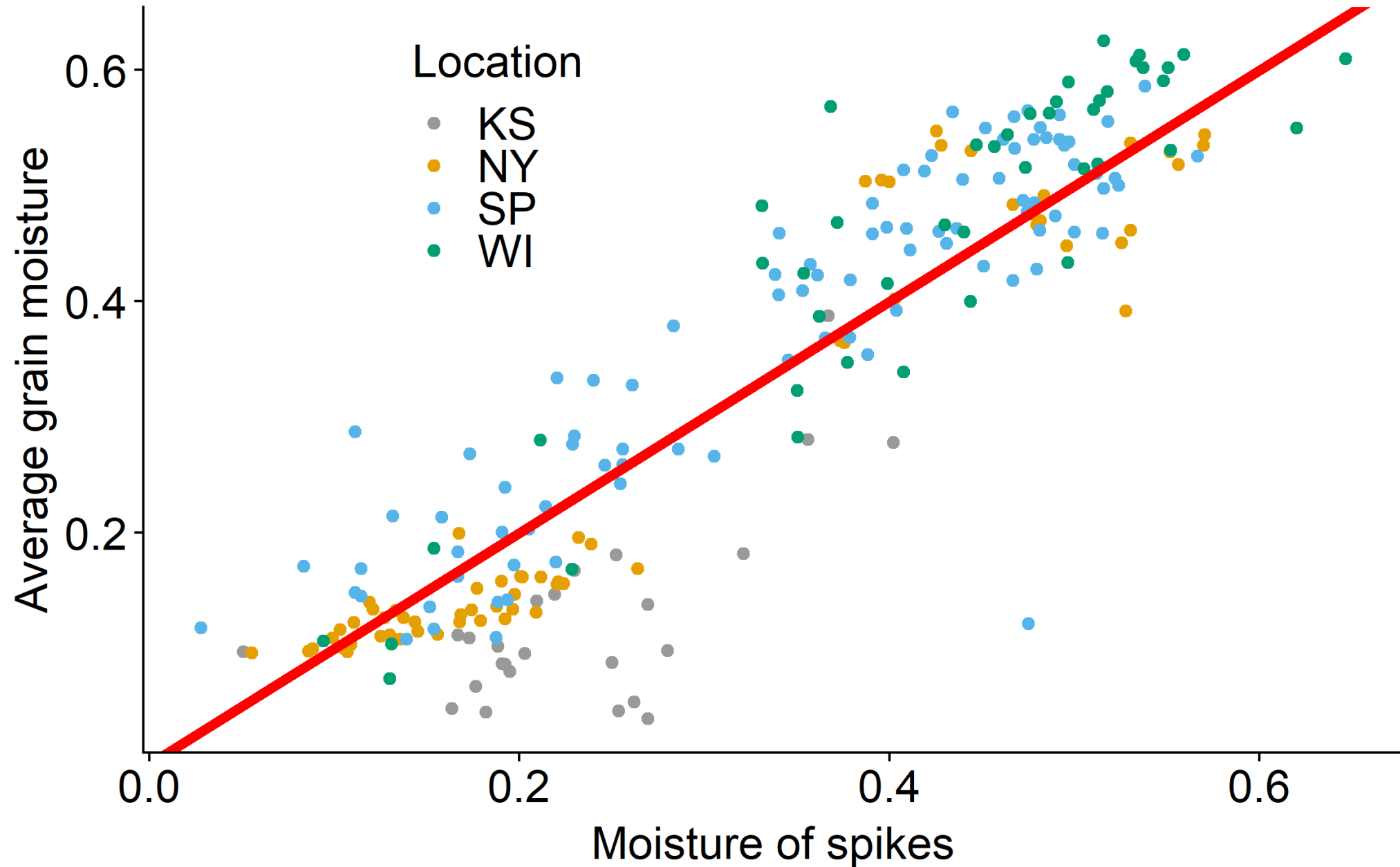
Kernza Spike Yield



Kernza Spike Yield



Kernza Spike & Seed Moisture



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

Acknowledgments

- UMN: Craig Sheaffer, Jess Gutknecht, Don Wyse, Nancy Ehlke, Charlie Frahm, Nicole Tautges
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- Wisconsin: Valentin Picasso, Dave Stoltenberg, Joe Zimbric

Questions?













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