

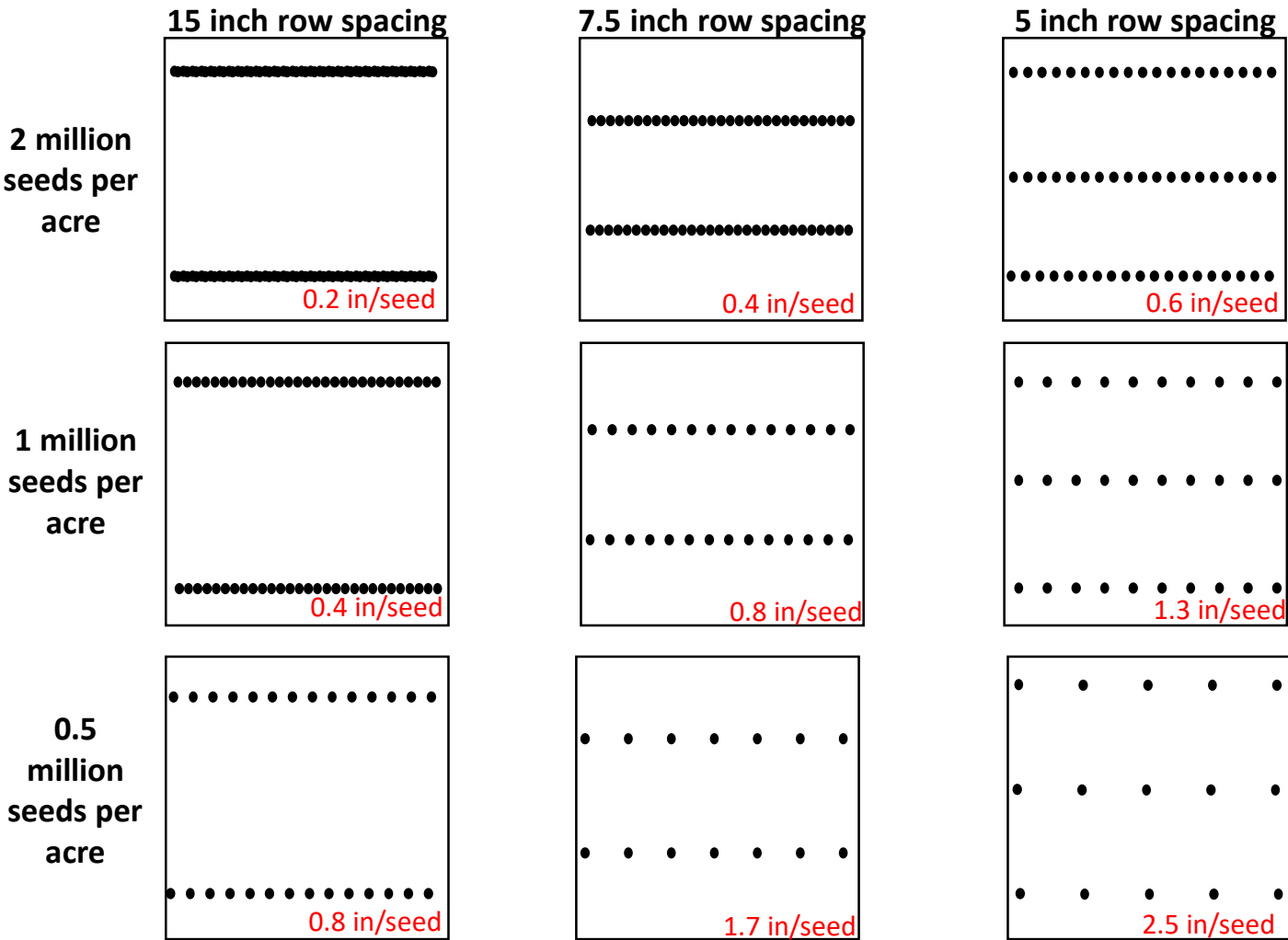


Singulating Wheat Seed: Are We There Yet?

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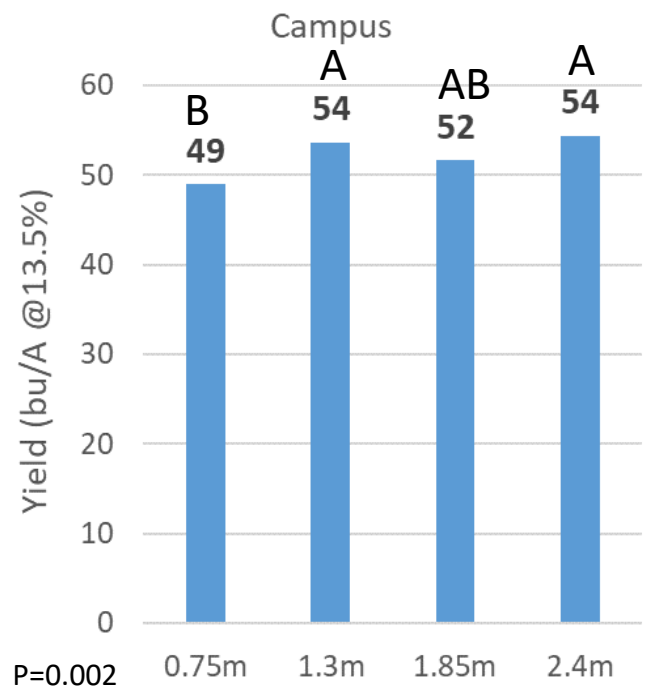
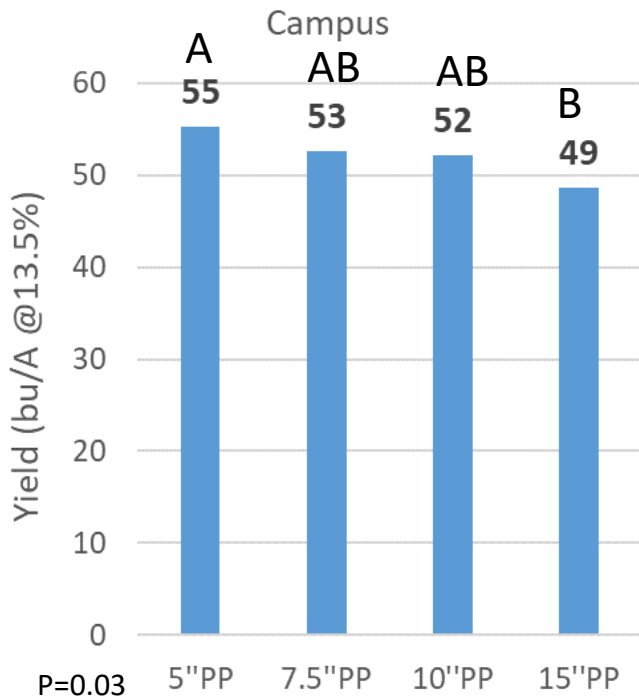


- **Problem:** Conventional seed drills currently used to plant wheat can result in non-uniform seeding depth as well as variable within-row seed spacing causing poor germination, crown root development and tillering, and reduced yield potential.
- **Hypothesis:** Uniform distribution of plants resulting from precise placement (i.e. improved singulation and uniform seeding depth) of seed can lead to increased input use efficiency, reduced plant-to-plant competition, and improved plant health; resulting in lower input cost and increased yield potential. Plant population can be reduced without compromising wheat yield.
- **Objective:** Design a crop canopy structure that can maximize light interception early in the season and lead to higher yield.
- **Methods:** In 2017 and 2018, research plots were planted at MSU campus and SVREC using a precision planter with four row spacings (5", 7.5", 10", and 15") and a seed drill at 7.5" spacing. Four seeding rates (ranging from 0.5 to 2.4 million/acre) were used.



Preliminary Results

- Precision planting ensued more uniform seeding depth compared to the seed drill, leading to uniform plant development and phenology.
- Seed-to-seed spacing was more consistent in plots planted with the precision planter resulting in uniform tiller development compared to high variability found in drilled plots.
- Canopy closure was achieved fastest in 5" row spacing but was similar to 7.5" row spacing. Canopy closure was delayed in 10" and 15" row spacing across all seeding rates. Early canopy closure in 5" and 7.5" rows potentially led to higher yield observed in narrow rows in this study.
- Seeding rate of 1.3m seeds/acre closed canopy at similar rate to 1.85 and 2.4m seeds/acre but faster than 0.75 m seeds/acre across all row spacings; indicating the potential to reduce seeding rates without compromising wheat yield.
- Wheat varieties differing in leaf angles might respond differently to variation in row spacing and seed rate, so further research is warranted to evaluate wheat varieties with differing growth habits (part of another ongoing research trial).
- Uniform plant development also has the potential to increase fungicide efficacy.



5" spacing



7.5" spacing



10" spacing



15" spacing