

EVALUATING DIVERSE CORN GENOTYPES FOR BIOMASS PRODUCTION IN IOWA

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1. Rationale

- Tropical corn that is not adapted, with delayed maturation as well as extended growing period could capture potentially more biomass, especially in northern temperate climates such as Iowa.
- This study will identify the effect of relative maturity (RM) of corn hybrids on overall corn growth, by evaluating in-season crop growth, light interception and biomass production.

2. Method



Fig. 1 Measurements during the growing season

- Field trials were established at the Sorensen Research Farm in Boone County, IA during 2014 and 2015.
- Six genotypes (four hybrids of 104 RM, 110 RM, 114 RM, 120 RM, and two tropical corn of 130 RM) were planted on 20 May 2014 and 13 May 2015.
- The experimental design was a split-split plot with four replications; plant arrangement (plant density vs row spacing) as the whole plot. This study also identified the effect of management practices on crop growth, light interception, and biomass production.

3. Research Results

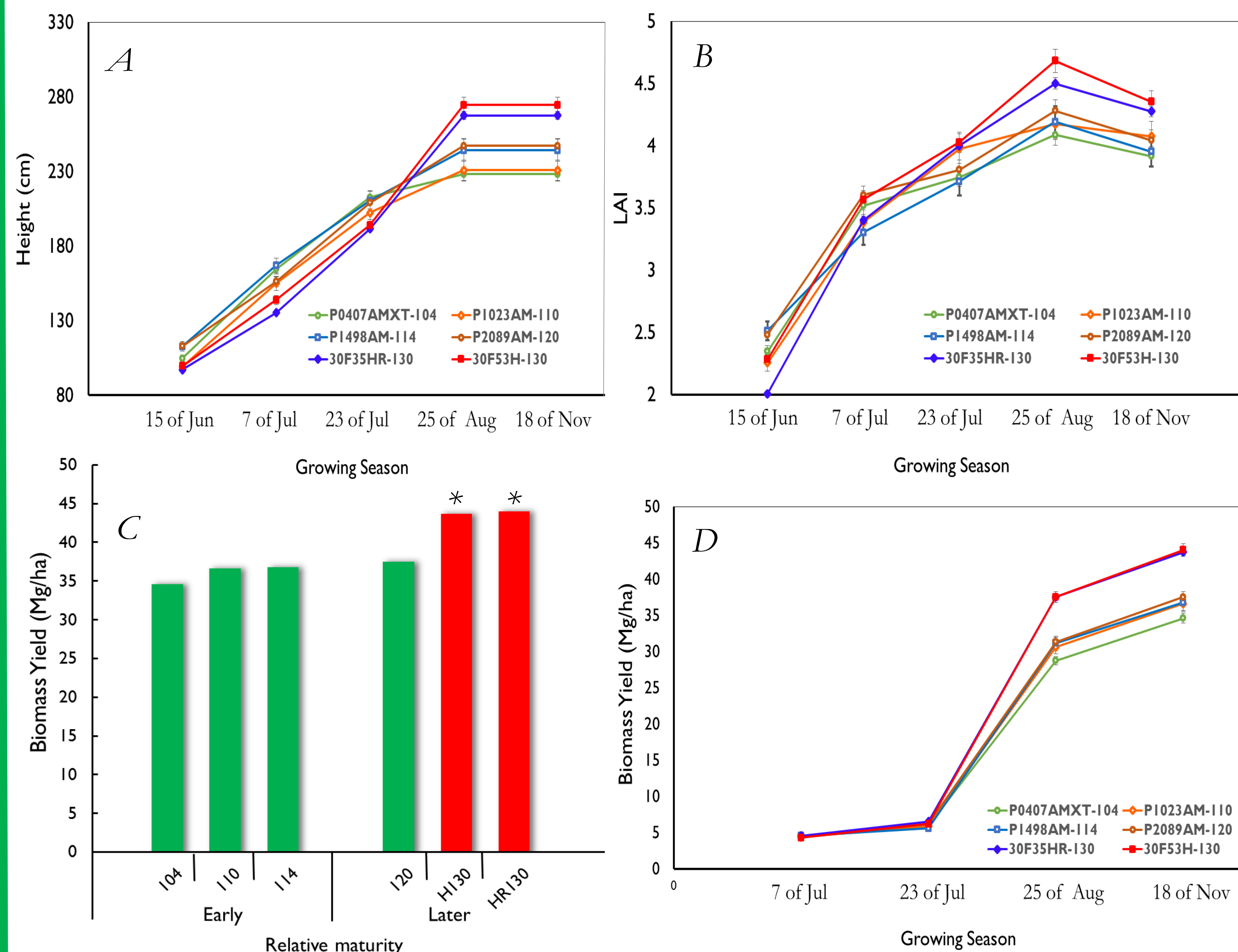


Fig. 2. (A). Height of tropical and commercial hybrids. (B). LAI of tropical and commercial hybrids. (C). Final biomass accumulation of tropical and commercial hybrids. (D). Biomass of tropical and commercial hybrids during the growing season of 2014.

- Commercial hybrids were more developed than tropical corn during the growing season. On the other hand, tropical corn was taller, had greater leaf development, LAI, and overall biomass yield.
- Reproductive stages of development for tropical corn began comparatively late, more than 15 days later than the hybrids on average, extending the growing period and capturing more biomass.

4. Summary and Conclusion

- Unadapted Tropical hybrids flowered later and had 20% greater biomass yields in average.
- Adapted hybrids yielded more grain while tropical corn had greater biomass yields.
- This study demonstrates tropical corn has high biomass potential in Iowa climates.