Maize intraspecific competition dynamics: the genomic architecture behind competitive ability

Aimee J Schulz[1]; M. Cinta Romay [2]; Kelly Robbins[1]; James B Holland[3 4]; Edward S Buckler[1 2 5]

[1] Section of Plant Breeding and Genetics, Cornell University, Ithaca, NY 14853 [2] Institute for Genomic Diversity, Cornell University, Ithaca, NY 14853
[3] Department of Crop and Soil Sciences, North Carolina State University, Raleigh, NC 27695 [4] Plant Science Research Unit, USDA-ARS, Raleigh, NC 27695 [5] USDA-ARS; Ithaca, NY 14853

Cornell University

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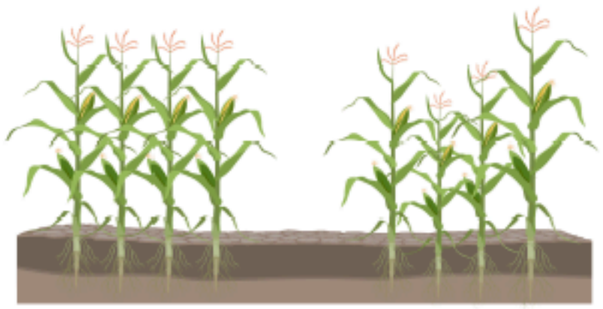
Introduction:

- Plant-to-plant competition causes reduced yield and increased variability across a field
- Understanding the genomic architecture of competitive ability will allow breeders to select for more cooperative plants



Cooperative
Limited neighbor effects

Competitive
Large neighbor effects

Competitive traits:

- Plant height
- Leaf angle
- Root architecture
- Shading of neighbors

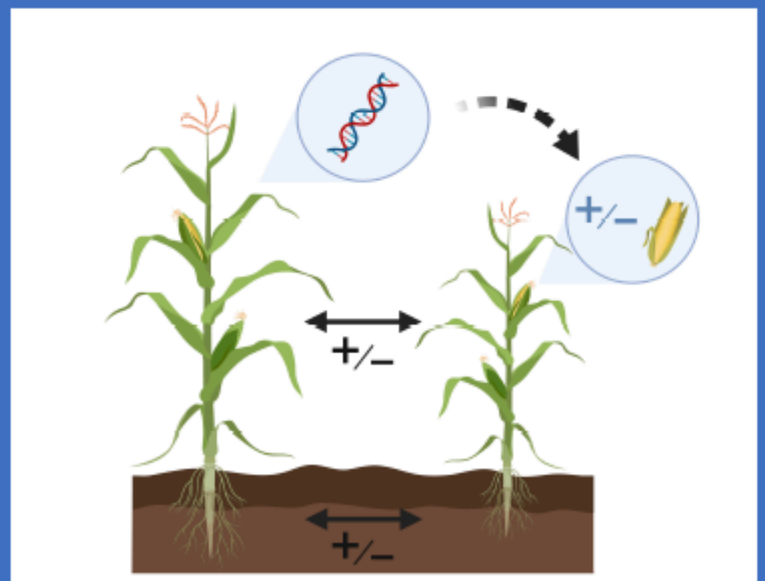
Fitness costs:

- Reduced yield of neighbors

Hypothesis: Competitive ability and impact on a neighbor's fitness is variable across maize genotypes, and will be more apparent in stressful environments

Next Steps:

- QTL mapping and GWAS for SNPs impacting neighboring plants, utilizing additional populations

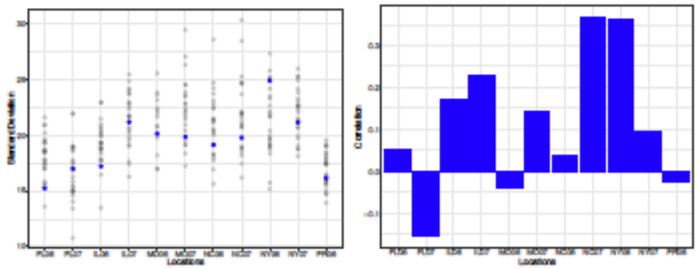


Prediction:

Neighbor genotypes have a quantifiable impact on an individual's phenotype and can be mapped.

Variation Across Environments:

Self and neighbor heights vary by genotype and environment within a population. The standard deviation for plant height across all populations and the correlation between self and neighbor height within a population also vary by environment.

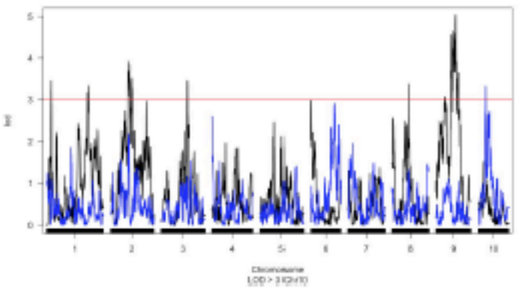


Adjacent Row Mapping:

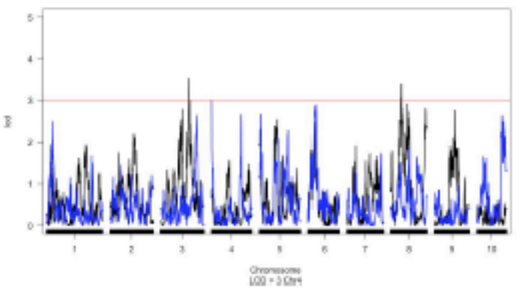
QTL were mapped for self height (black) and the height of the neighbor (blue) by using the height of the neighboring rows and the genotype of the individual row of interest.

Different peaks were identified for self vs neighbor, and are unique depending on the population and the environment.

New York 2006



Florida 2006



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Want to know more? Visit **www.maizegenetics.net/aimeeschulz**

Questions? Contact me:
ajs692@cornell.edu