Heterotic Performance of a Broad Range of Sativa-Falcata Hybrids. (C01-riday124606-Poster)

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Abstract:

Progeny of Medicago sativa ssp. sativa by ssp. falcata crosses show high-parent (HP) heterosis for biomass yield. However, sativa-falcata hybrids show slower regrowth and earlier fall dormancy than elite sativa germplasm. Our objective is to develop a holistic model of sativa-falcata heterosis that moves beyond just quantitative genetic mechanisms to include climate and population components. This model could lead to heterosis prediction and QTL detection, enabling breeders to maximize yield improvement while minimizing negative agronomic effects of hybrids. To elucidate the sativa-falcata heterotic pattern in terms of phylogeography, we selected falcata genotypes from across their range (45 populations; 126 genotypes; 1-5 per population). 16 genotypes are elite sativa material. All 126 genotypes were crossed to 4 elite sativa germplasms. 2001 total yearly biomass HP-heterosis ranges from -30% to 70% among genotypes. Falcata genotypes have higher mean levels of and greater variance for HP-heterosis than elite sativa genotypes. We clustered genotypes based on climate of origin variables. Variables that differentiate northern from southern latitudes are associated with HP-heterosis.

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