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Funding Source: NSF-REU Program in Biological Sciences & Biochemistry

A phenotypic comparison of heterosis and inbreeding depression across different ploidy levels of maize  
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It is hypothesized that dosage-dependent gene regulators controlling the quantitative traits contribute to heterosis and inbreeding depression in maize. Heterosis, also known as hybrid vigor, refers to the phenomenon that the F1 progeny derived from crosses between diverse inbred varieties exhibit greater biomass, development rate, and fertility than the better of the two parents. Inbreeding depression, however, is the reverse of heterosis in which case the offspring have inferior traits to that of the parents. The study of heterosis and inbreeding depression at different ploidy levels will help us to test this hypothesis. Maize was planted in completely randomized blocks replicated three times. We will be analyzing nine phenotypic traits to help us determine if there is a significant difference between the diploid and triploid hybrid plants in heterosis as well as diploid and tetraploid hybrid plants for the rate of inbreeding depression. This will be done by looking at both the hybrids and their corresponding inbred parents of all ploidy levels. The most recent trait available to be analyzed is the height at four weeks. Statistical analysis of the plant height at four weeks will be used to analyze heterosis in each hybrid at different ploidy levels and determine if gene dosage is indeed a factor in inbreeding depression and heterosis.