Effect of Flooding on Photosynthetic and Physiological Traits Among Several Maize Genotypes

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Maize is one of the three staple grains which sustain the global diet, and is the most produced crop in the U.S.. With increasing extreme and unpredictable weather patterns resulting from climate change, it is important that new lines are developed to adapt to these conditions. Flooding is one weather event that puts current maize production at risk. This study aims to evaluate the growth performance of diverse maize germplasms under flood stresses and identify genotypes that exhibit superior resilience and adaptation to the stress environment. In each rep, 126 maize germplasm encompassing diverse Mexican landraces, teosintes (maize wild relatives), inbred lines, and progenies developed from tropical maize inbred lines, were phenotypically examined. A field trial was conducted at the University of Delaware farm located in Newark, DE, and was arranged in a randomized complete block design, with two blocks per treatment (flood and control). Flood was induced 30-40 days after planting. Each genotype was screened for SPAD value and other photosynthesis related traits, height, stem count, and flowering to analyze flooding treatment effects. Preliminary results show that flooding has a significant effect on the SPAD value, and the height of certain lines. ANOVA (analysis of variance) was utilized to test traits with respect to rep, treatment, and genotype as well as their interactions. Significant differences were found among all interactions for SPAD and Height. Severable genotypes were found to be comparable in flood and control treatments. Future research will utilize the identified genotypes to develop flood tolerant lines that meet current agronomic and yield standards.