

Modeling the Impact of Drought and Heat Stress on Maize Anthesis-Silking Interval

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Abstract

Understanding and enhancing plant resilience traits in maize is critical for ensuring consistent yields in the face of challenging conditions such as drought, disease, and insect pressure. The adoption of drought-resistant and insect-resistant maize varieties has already proven highly beneficial to growers, sparking further interest in uncovering the precise genetic and phenomic factors associated with increased resilience. This study utilized genetic, phenomic, and environmental data collected by Genomes to Fields teams across diverse regions of the United States. These regions exhibited a wide range of climatic conditions, from optimal to stressful, including drought and heat challenges. Leveraging advanced Machine Learning techniques, the study aimed to predict the impact of drought and heat stress on the anthesis-silking interval, a crucial trait influencing yield, and to identify the most effective combination of phenotypes for enhancing drought resilience in maize.

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