QTL Analysis for Agronomic and Morphological Traits of Spring Wheat in Stressed and Non-Stressed Environments. (C01-byrne125412-Poster)

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Abstract:

Spring wheat crops in the U.S. Great Plains face highly variable weather conditions, usually including heat and drought stress during grain filling. To determine genomic regions affecting performance under a range of stress levels we conducted QTL analysis in a recombinant inbred line (RIL) population developed from a cross of the heat tolerant cultivar Kauz by the heat sensitive line MTRWA116. One hundred and forty-four RILs were genotyped for microsatellite markers distributed across the genome, and evaluated for agronomic and morphological traits in four Colorado environments differing in degree of heat and drought stress. Quantitative trait loci were detected and characterized by a combination of single-factor analysis of variance, multiple regression, and composite interval mapping. Our analysis detected from one to five QTLs significant at $P<0.01$ for each trait. Significant QTL-by-environment interaction was observed for yield-related traits, while morphological characters like plant height were more stable across environments. Selected results will be presented and implications for plant breeding programs will be discussed.

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