Soybean water use phenotypes - screening of exotic germplasm. (C02-hufstetler134714-Poster)

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Abstract:

Soybean yields in the southeastern United States are limited primarily by water availability. In the present work, 23 soybean plant introductions, breeding lines, and cultivars were screened for variability in two traits related to drought tolerance: dry matter-based water use efficiency (WUE), and whole plant water use responses to soil water deficit. Soybean plants were grown in a greenhouse in a sandy loam soil amended with sand. Pots were capped to prevent water loss to soil evaporation, soil was maintained above 55% relative soil water content (RSWC), and all water additions were recorded. At 30 days after planting, pots were transferred to a lysimeter, where RSWC was strictly controlled by a computer-automated watering system to simulate a slowly developing water stress. During this time, daily water use was quantified as the normalized transpiration ratio (NTR). Total plant dry matter was determined 43 days after planting. Large (> 30%) differences in WUE were found among the entries, indicating that there is useful variability for this trait in soybean. Ongoing analyses will reveal whether or not there is variability among these lines for the response of NTR to RSWC.

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