Leaf Temperature: Applying the Crop Water Stress Index to Controlled Environments. (C02-pinnock151919-Poster)

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Abstract:

Controlled environments are characterized by highly restricted root-zone volumes. Irrigation in controlled environemtns is usually excessive and thus inefficient. Root-zone moisture sensors often fail to represent water status due to poor contact with soil-less media and inadequate sample volume. Irrigations might be better scheduled through the use of a plant indicator of water stress. The crop water stress index (CWSI) uses the canopy to air temperature difference to determine water stress. However, the CWSI needs to be modified for controlled environments where radiation intensity, CO2 levels, and wind speed vary widely among chambers. CO2 is important because it closes stomates and thus increases leaf temperature - without changing plant water status. We are developing a controlled environment water stress index that incorporates these environmental conditions. We are also exploring the use of real-time digital photography to measure leaf expansion rates and thus detect the onset of water stress.

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