

Instrument-based distortions of leaf/air temperature differences and interpretations of bean drought stress resistance

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Abstract:

The adaxial leaf temperatures of 3 cultivars of *Phaseolus vulgaris* and 1 cultivar of Tepary bean (*Phaseolus acutifolius*) were measured from 0600 to 1800 hours. 2 instruments having different measurement principles were used for leaf temperature and 2 sources of air temperature were used. Leaf temperatures were measured with the temperature sensor of a Delta T Mk II porometer and Heinman Infrared Thermometer KT 15 (emittance = 0.98). Air temperatures were measured with a thermohydrograph in a meteorological screen about 150 m from the crop and a sensor in a portable field Infrared Gas Analyser. Values of temperature differences (DT) differed depending on the instrument combination used, in this way affecting the interpretation of the plant's response to drought stress. Proper understanding and explanation of measuring techniques are shown to be an even more important prerequisite for parameters that are not easily observed directly.