Accurate estimation of photosynthetic electron transport with a new type of chlorophyll fluorometer. (C02-ennahli132941-Poster)

Authors:

- S.En Nahli - *University of Georgia*
- H.J.Earl - *University of Georgia*

Abstract:

Combined measurements of leaf gas exchange and chlorophyll fluorescence are useful in stress physiology research. We evaluated the ability of a new, field portable chlorophyll fluorescence / leaf gas exchange measurement system to accurately measure photosynthetic electron transport rates (ETR) in maize leaves. Two LI-6400 systems with leaf chamber fluorometers (LICOR, Inc) were used to estimate gross CO2 assimilation (Ag) and ETR at nine PPFD levels between 150 and 2400 umol m-2 s-1. Contrary to results with other instrumentation, the relationship between ETR and Ag was not linear; at high PPFD levels, the ETR / Ag ratio declined. This was caused by underestimation of the efficiency of photosystem II (phiII), due to insufficient intensity of the saturating pulse of light used to induce the maximum fluorescence signal. However, by applying multiple pulses of different intensities, it was possible to estimate the true phiII value as the intercept of a linear regression of phiII on the inverse of the pulse intensity. When this estimate of phiII was used to calculate ETR, the expected linear relationship between ETR and Ag was observed, suggesting that ETR was accurately estimated.

Corresponding Author Information:

Said En Nahli
University of Georgia
3111 Miller Plant Sciences Bldg., Univ. of Georgia
Athens, GA 30602-7272

phone: 706 542-4066
e-mail:
saidenna@uga.edu

Presentation Information:

Presentation Date: Tuesday, November 12, 2002
Presentation Time: 4:00-6:00 pm
Poster Board Number: 1031R

Keywords:
chlorophyll fluorescence, photosynthesis, leaf gas exchange, thylakoid electron transport