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Farmers’ and academia’s views”

## Effects of water deficit and VPD on leaf pigments in (sub)tropical bread wheat

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### Abstract

(Sub)tropical wheat production is threatened by increasing, climate change -induced frequencies and intensities of soil- and airborne water deficits. Leaves, and in particular their pigments, form the basis for assimilate accumulation in plants and, therefore, the source for yield building processes. Under water deficit and changes in VPD, leaves may adapt their pigment composition to mitigate negative impacts and maintain the integrity of the photosynthetic apparatus. However, little is known about the genetic variation in pigment composition and its potential for acclimation to stress in wheat.

To test this, 4 contrasting wheat lines from CIMMYT’s Best PT panel, funded by IWYP (International Wheat Yield Partnership) and FFAR (Foundation for Food & Agriculture Research), were grown in a glasshouse at the University of Hohenheim, in 1.5 l pots containing a 50/50 (v/v) mixture of soil and commercial compost. Five-week-old plants were exposed to high or low VPD, targeting values of 2.3/1.9 and 0.7/0.2 kPa day/night, respectively, and watering withheld for 10 days. Chla fluorescence, photochemical reflectance index (PRI), and SPAD were measured on the youngest fully developed leaf and two older leaves lower on the main tiller at the beginning and at the end of treatments. Concomitantly with these measurements, leaf samples were taken and immediately frozen in liquid N<sub>2</sub> for further pigments analysis by HPLC. Results will be discussed in relation to: 1. Identification of differences in pigment composition among wheat lines with contrasting response to water deficit; 2. association of changes in the pigment ensemble and leaf reflective properties, elicited by water deficit; 3. Discuss the potential of photoprotective pigments as a selection trait for drought resilient wheat.

**Keywords:** HPLC, leaf pigments, VPD, water deficit, wheat