Evaluating structural, chlorophyll-based and photochemical indices to detect summer maize responses to continuous water stress

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Supplementary Materials:

1. Base Line Calculation

We selected the meteorological data between 10:00 and 15:00 at local time excluding data at 12:00 to avoid the impact of mid-day depression of photosynthesis and other cloudy times to ensure data reliability. We developed in different stages for a non-stressed baseline was shown in Figure S1. In ST1, the baseline was described by the following equation:

$$T_C - \mathrm{T}_a = 4.12 - 1.34\mathrm{VDP}\ (\mathrm{r} = 0.69)\ \text{in}\ 2013 - 2015 \quad (1)$$

while in ST2, we were only able to measure data in 2014 and 2015, the absence data in 2013 caused by failure of instrument, the baseline was described by following equation:

$$T_C - \mathrm{T}_a = 5.08 - 0.23\mathrm{VDP}\ (\mathrm{r} = 0.61)\ \text{in}\ 2014\ \text{and}\ 2015 \quad (2)$$

In ST3, the baseline in different years showed distinct features and could be described by following equations,

$$T_C - \mathrm{T}_a = 6.33 - 0.18\mathrm{VDP}\ (\mathrm{r} = 0.58)\ \text{in}\ 2013 \quad (3)$$

$$T_C - \mathrm{T}_a = -9.67 + 0.58\mathrm{VDP}\ (\mathrm{r} = 0.82)\ \text{in}\ 2014 \quad (4)$$

$$T_C - \mathrm{T}_a = 8.53 - 0.53\mathrm{VDP}\ (\mathrm{r} = 0.55)\ \text{in}\ 2015 \quad (5)$$

The slope and intercept differences in ST3 might due to the maize distinct physiological characteristics and the meteorological features. When maize enters the maturity growth, the photosynthesis, transpiration and stomatal conductance differs a lot from other stages. Similar phenomenon can also be found in the study of Cui et al. [1].

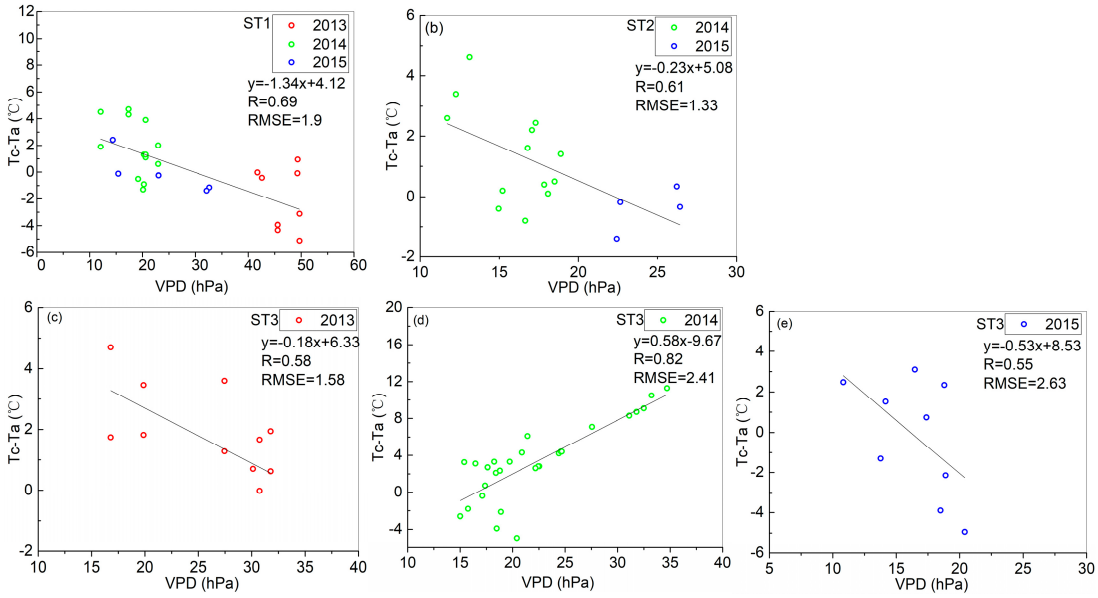

Figure S1. The relationships exhibit between T_c-T_a and VPD in the main growth stages during 2013-2015.

2. Variables for Minimum Canopy Resistance Calculation

According to the Eq. (4), in order to get the CWSI values, the minimum canopy resistance is required. While d and z_0 are the crucial varieties to calculate r_{cp}, maize is one of the kinds of tall and low-density species, d and z_0 differ from various growth stages, consulting precious researches [2,3]. The ratios of d and z_0 to the crop height (h) used in this study were shown in Table S1,

Table S1. Roughness and zero-plane displacement

Variables	Vegetative growth	Reproductive	Maturity
z_0/h	0.05	0.08	0.06
d/h	0.60	0.50	0.55

References

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