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Transpiration and Leaf Movement of Cotton Cultivars Grown in the Field under Arid Conditions

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Abstract: Five cotton (*Gossypium hirsutum* L.) cultivars were grown in the field in Xinjiang, China to evaluate their adaptability to arid conditions in terms of leaf temperature, transpiration rate and leaf movement. Leaf temperature was higher in the morning and lower in the afternoon as compared with air temperature. There were large differences in the transpiration rate represented by the flow rates of stem sap per unit leaf area (FRSS) among the cotton cultivars. The transpiration rate in cotton generally depended on vapor pressure deficit (VPD). In the cultivars with a low transpiring ability, however, the influence of VPD was lower in the higher range of VPD. Cultivars with higher transpiring ability tended to have higher intercepted radiation per unit leaf area (IRL), i.e., to show active diaheliotropic leaf movement. The higher transpiring ability of cotton might be able to reduce heat stresses caused by diaheliotropic leaf movement and be profitable for yield under the arid conditions.

Keywords: Diaheliotropic leaf movement, Integrated solarimeter film, Leaf temperature, Transpiration ability, Vapor pressure deficit (VPD)

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