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Effects of Leaf Movement on Radiation Interception in Field Grown Leguminous Crops : IV. Relation to leaf temperature and transpiration among peanut cultivars

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Abstract:

Leaf movement and its relations to radiation interception, transpiration and leaf temperature in peanut cultivars were examined. Five cultivars (Chibahandachi, Tachimasari, Kanto 56, Valencia and Kintoki) were grown under field conditions. At the pod filling period, leaf movement was restrained by covering with a nylon net. The diurnal changes of leaf temperature, the intercepted radiation of leaflets in the uppermost layer of the canopy, and the infrared thermal images were compared with those of the control.

Transpiration rate and stomatal resistance were measured in the control plants. The leaf temperature of the treated plants of Tachimasari, Valencia and Kintoki were higher than those of the control. The control had a similar leaf temperature to the air temperature. Chibahandachi and Kanto 56 had higher leaf temperature in the control during the afternoon. The leaf temperature of the treatment decreased in the afternoon. The control plants intercepted greater radiation than the treatment in Kanto 56, Valencia and Kintoki on cloudy days. On clear days, a greater amount of radiation was intercepted in Tachimasari and Kanto 56. Chibahandachi had the greatest transpiration rate, followed by Valencia, Kanto 56 and Tachimasari. The infrared thermal images of Tachimasari and Kintoki were higher than those of Chibahandachi and Kanto 56. It was therefore assumed that a cultivar with high transpiration ability showed active diaheliotropism and a cultivar with low transpiration ability exhibited active paraheliotropism.

Keywords:

Heliotropism, Infrared thermal image, Intercepted radiation, Leaf temperature, Transpiration

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