

Water stress monitoring in soybean plots with surface thermal records and crop coverage data

de la Casa, A., G. Ovando, G. Díaz, P. Díaz, F. Soler and C. Miranda

Revista Argentina de Agrometeorología RADA, v. XII (2021): 1–14

Summary

This work analyzes the water stress in soybean with indicators derived from thermometric (MLX) and thermographic (FLIR) records of leaf temperature (Tf). In addition to the difference between Tf and air temperature (Ta), the water deficiency index (WDI) obtained with MLX (WDIMLX) and FLIR (WDIFLIR) from the relationship between Tf - Ta and crop coverage (CC) was also used. The study was developed between 11/19/2019 and 03/31/2020, in a field near the Córdoba city where 4 treatments were established: 100 mm of irrigation and 100 kg ha⁻¹ of urea (RRF); 100 mm of irrigation (RR); 50 mm irrigation (R) and dry (S). An inverse linear relationship was determined between Tf - Ta and CC, which is explained because, when CC is incomplete, Tf is high due to the higher proportion of exposed soil and not due to lack of water. While for CC and the soil water content (IEAS) there were no significant differences ($p < 0.05$) between treatments, these were presented between RRF and the rest for Tf-Ta, WDIMLX and WDIFLIR. However, only WDIMLX achieved a significant correlation with IEAS for RR and S, demonstrating a greater ability to detect water stress.

Key words: WDI; soil water; TIR