Effect of plant cover on soil water content and seasonal changes in evapotranspiration

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A b s t r a c t : The soil water content and evapotranspiration on the fields with different crops were analysed during two vegetation seasons of years 1992 and 1993. The measurements of the soil water content carried out simultaneously under various field crops showed that the spatial distribution of the topsoil water content changed depending on the amount of rainfall and the type of the stand. The effect of the plant cover on the soil water content was manifested mainly in the field with spring wheat, where the dryer soil was recorded in comparison with the conditions under the maize and sugar beet stands. Despite the dryer soil in the root zone, the evapotranspiration from the wheat field can exceed the evapotranspiration of the maize or sugar beet stands because of the differences in the leaf area index determining the main evaporating surface. It was found out simultaneously, that the evaporation can be intensive also from the partially uncovered wet soil, while the total water losses are smaller, owing to a lower density of plants, resulting in less soil water uptake by roots. Thus, the type and stage of the canopy can control the transpiration, as well as the amount of the precipitation reaching the soil surface, and consequently the water content in the soil profile.

Key words: soil water content, topsoil, water fluxes, interception, cabbage (seedlings), sugar beet, wheat, potatoes, maize.

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