

A SZAKDOLGOZAT TARTALMI KIVONATA/ABSTRACT

Dolgozat címe: Evaluation of the effects of soil bacteria treatments on field crops by remote sensing techniques

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Szak, képzési szint és tagozat megnevezése: Idegennyelvi szakmai kommunikátor szakirányú továbbképzési szak, esti tagozat

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Various remote sensing (ground-based, aerial) techniques have long been used to assess the condition of vegetation.

A number of vegetation indices have been generated using these methods to characterise plant physiological processes such as photosynthetic pigment levels, N content and water content.

Many of the vegetation indices have been developed for natural vegetation species, but much less information is available on their applicability to agricultural crops, perhaps to assess the effects of specific treatments.

The main question of our research is therefore whether ground and airborne remote sensing can be used to assess the effects of nutrient replenishment experiments in agricultural fields?

We applied *in vivo* field measurements (field spectroradiometer, drone mounted multispectral camera) to determine vegetation indices related to photochemical pigment composition, photochemical activity, stress resistance, nitrogen and water content of leaves.

The effects of different soil bacteria treatments on barley and wheat were studied in 2019 at the Agricultural Research Institute in Kompolt, moreover, we compared them with our previously published investigations on several other crops (maize, sunflower, rape, barley) carried out in 2017 and 2018.

Our results show that in spite of the significant level of the standard deviation of data in field conditions, treated (mainly with stubble decomposers + soil inoculators) wheat leaves could be characterized by significantly higher chlorophyll and water content, higher photochemical efficiency, and lower carotenoid content, but in the case of barley we couldn't reveal the beneficial effects of treatments by these methods, which probably due to that the very rainy spring caused inland water on the experimental plot, which negatively influenced living conditions of soil bacteria.

In the case of wheat, spectral vegetation indices showed a positive effect of soil bacterial treatments already at the beginning of flowering, which is consistent with the yield, similar to the results obtained in 2017 and 2018 for maize, sunflower, rapeseed and barley.