2022-09

Phenotyping of maize yield traits via proximal sensing techniques

Buđen Maša, Ljubičić Nataša, Brdar Sanja, Kostić Marko, Panić Marko, Kitić Goran, Marko Oskar

IPPS 2022 Conference Book

7th International Plant Phenotyping Symposium

'Plant Phenotyping for a Sustainable Future'

Wageningen, the Netherlands
September 26-30, 2022

www.ipps7.org

IPPS 2022 Conference Book

7th International Plant Phenotyping Symposium

'Plant Phenotyping for a Sustainable Future'

Wageningen, the Netherlands
September 26-30, 2022

www.ipps7.org

The International Plant Phenotyping Symposium is a conference jointly organized by:

The International Plant Phenotyping Network (IPPN) e. V.
Wageningen University & Research (WUR)
The Netherlands Plant Eco-phenotyping Centre (NPEC)

PHENOTYPING OF MAIZE YIELD TRAITS VIA PROXIMAL SENSING TECHNIQUES

PHD STUDENT MASA BUĐEN MSC.[1]; DR. NATAŠA LJUBIČIĆ PHD[1];
PROF. DR. SANJA BRDAR PHD[1]; PROF. DR. MARKO KOSTIĆ PHD[2];
PROF. DR. MARKO PANIĆ PHD[1]; DR. GORAN KITIĆ PHD[1]; DR. OSKAR MARKO PHD[1]

[1] BioSense Institute;
[2] Faculty of Agriculture Novi Sad

Phenotyping, via proximal and remote sensing techniques, has been increasingly used to provide information about plant properties in a large range of crops. A large number of spectral reflectance indices (SRI) computed from proximal sensing data has become useful tool for agricultural monitoring, assessing within-field crop variability which can support the right decisions in field management. The objectives of this study were to evaluate the potential of using an active, portable, multispectral proximal canopy sensor, namely Plant-O-Meter, to detect the influence of different nitrogen (N) supply on maize yield traits. The Plant-O-Meter device possess the multispectral source, which integrates four light sources in one optical module and based on four band combinations (465, 535, 630 and 850 nm) allows calculation more than 30 different SRI. In order to estimate the influence of N applications on variability of grain yield traits of maize, four maize hybrids (Zea mays L.) of different maturity were selected (P9074, P97557, P9889 and P0725). The study included five different N treatments (0, 70, 140 and 210 kg N ha-1), as pre-plant and top-dress applied. The sensor measurements were performed at throughout the season, from V4 (4 fully developed leaves) until R2 (blister) corn growth stages. The relationships between yield traits and SRI were determined using Pearson correlation coefficient. The results revealed that maize genotypes responded differently to different N conditions and significant correlations were found between certain SRI and yield traits. However, since that significance of examined SRI highly differed depending on growth stage of maize, the results of this study highlight the need for careful selection of suitable indices and optimal timing of the measurements to increase the accuracy of in-season spectral phenotyping for grain yield and yield traits, respectively.