



**XI INTERNATIONAL SYMPOSIUM OF
AGRICULTURAL SCIENCES**

BOOK OF ABSTRACTS

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**XI INTERNATIONAL
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AGRICULTURAL SCIENCES**

**26-28, May, 2022
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Advanced phenotyping techniques in sunflower breeding

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Abstract

Breeding and phenotyping of sunflower are mainly based on traditional methodologies that are generally time-consuming, labor-intensive, prone to errors in the sampling, and with, in some cases, biased nature of the evaluation results. However, over the past decade, plant phenomics has made impressive progress in developing sensors and imaging techniques for a wide range of crop traits, organs and incidences. They enabled direct or indirect monitoring of growth and development, recording of architecture and helped evaluate resilience and tolerance to biotic and abiotic stresses. In IFVCNS, there were several successful attempts to use advanced phenotyping techniques in the identification and determination of desirable traits in sunflower. Using Flower Color Image Analysis (FloCIA) software, enhanced ray florets color determination and paved the way to more objective and accurate sunflower phenotyping, while thermal imaging was used for screening of sunflower for tolerance to Sclerotinia head and stem rot. Besides monitoring the development of the above-ground parts of plants, the automated image platform has been used for sunflower root development and morphology screening. Within the framework of SmartSun and CROPINNO projects and activities of Climate Crops Centre, a prototype of an automated root phenotyping platform for analysis of root system architecture of plants grown in rhizotrons was set. The aim is to monitor root development and morphology (architecture) of sunflower genotypes from the IFVCNS collection, under water stress conditions. This will facilitate the creation of a sunflower “ideotype” for the 21st century, more resilient to extreme environmental conditions caused by climate change.

Key words: sunflower, phenotype, digital image, rhizotron