

**CODE: 028**

**Topic:** Remote Sensing in agricultural and forestry systems

**Type of presentation:** Poster

### **23.8 MONITORING OF COFFEE TREE GROWTH THROUGH CROP SURFACE MODELS AND MGVRI WITH IMAGES OBTAINED WITH RPA**

**Gabriel Araújo e Silva Ferraz<sup>1\*</sup>, Luana Mendes dos Santos<sup>1</sup>, Marco Thulio Andrade<sup>1</sup>, Leticia Aparecida Gonçalves Xavier<sup>1</sup>, Diogo Tubertini Maciel<sup>1</sup>, Patricia Ferreira Ponciano Ferraz<sup>1</sup>, Giuseppe Rossi<sup>2</sup> and Matteo Barbari<sup>2</sup>**

<sup>1</sup> Federal University of Lavras, Campus Universitário, PO Box 3037, Lavras, Minas Gerais, Brazil, CEP 37200-000, [gabriel.ferraz@ufla.br](mailto:gabriel.ferraz@ufla.br)\*

<sup>2</sup> Department of Agriculture, Food, Environment and Forestry (DAGRI), University of Florence, Via San Bonaventura, 13 -50145, Florence, Italy

\* Author for correspondence

#### **Abstract:**

Monitoring of crops during the vegetative and reproductive period is necessary for precision farming. Currently, remote sensing platforms such as remotely piloted aircraft (RPA) have stood out. Considering the above, the objective of this work was to evaluate the application of MGVRI vegetation index and Crop Surface Models (CSM) with images obtained by an RPA, to monitor the growth of coffee trees in the months, June 2017, December 2017 and May 2018. The experiment was carried out at the Federal University of Lavras, Lavras, Minas Gerais, Brazil, in an area cultivated with coffee species *Coffea arabica* L.. A RPA equipped with a digital camera was used to take photos and AgisoftPhotoScan software was used to build the mosaic of photos and CSM. The processing of the images to obtain the height of the plants, application of the MGVRI index and the preparation of the map layouts were performed in the QGIS software. With the CSM it was possible to identify the crop failure areas. Crop Surface Models (CSM) showed to be a promising technique for the monitoring of coffee tree growth, making it possible to identify crop failures and growth variations. The MGVRI index failed to identify crop failures, confused soil with vegetation and was influenced by variations in lighting in the area.

**Keywords:** Precision Agriculture, plant height, remote sensing, UAS, index vegetation.