



Spectral-based vegetation mapping on an intensive cherry orchard

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Production of appropriate quality and quantity horticultural products are provided by excellent agro-ecological conditions, which are derived from the location of Hungary. Harvested area of cherry production was continuously decreased from the 90s for a decade, ever since it was slightly increased or stagnated. Over the period of 2006 to 2016, the harvested area of cherry was almost doubled. Due to the developing of production technology and the appropriate choice of variety, yield was slightly increased (FAOSTAT, 2018). An important principle in cherry production is the competitiveness, which can be achieved with high quality fruit, reduced pesticide and applying ecological point of views in plant production. Improving the competitiveness of fruit production can be provided with acquiring more and “novel” spatial and temporal information about the plantation, which can be useful for monitor the growing dynamics of the fruit trees. Supporting production with different (field, airborne, and/or space) sensors, fruit production could be effective and precise. Certain sensors obtaining spectral information about the vegetation activity of plant, which can support the decision in a field operation.

Spectral surveys were executed in an experimental plantation with different variety-rootstock of cherries and different tree spacing at the Study and Regional Research Farm of the University of Debrecen, nearby Pállag. Vegetation analysis were executed by GreenSeeker 505 sensor (NTech Industries, Inc., Ukiah, CA, USA). NDVI (Normalized Difference Vegetation Index) was recorded by the sensor, which correlate the vegetation activity of each tree. GPS based NDVI maps were created and evaluated by Surfer13 software environment.

Based on the results, the lowest NDVI average values were measured on Gisela 5 rootstocks, Gisela 6 and Colt rootstocks provided highest NDVI values, so highest vegetation activity. Only one variety (ReginaTM Cherry) was on Gisela 3 rootstock, which was indicated larger canopy volume on sandy soil.

These result can be effective for optimization of sprayer systems, so it can be optimized pesticide and reduce the cost and environmental impact in horticulture.

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