

Peach tree canopy assessment through aerial image detection for improved management and sustainability

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Abstract:

Precision agriculture aims to detect differences in plant development within a defined area, allowing to adjust production techniques according to the plant development. Plant development is evaluated by remote detection allowing the application of variable rate application techniques. The efficiency of precision agriculture is correlated with large areas of the same crop where plants development is highly correlated with soil characteristics variation. The application of precision agriculture in fruit production is common in the species that allow mechanical harvesting, and, consequently, allows obtaining yield maps. Peach production is carried out by manual harvesting and is usually based on medium-sized parcels, as the fruit is very perishable and harvest window for each cultivar is short, from 10 to 15 days. This paper describes the experimental tests developed to evaluate the volume of peach tree canopy, based on images captured by a drone, and its correlation with trunk section area, which is a common way of assessing tree vigor. Ten plants per orchard were monitored in 20 different orchards. The correlation between tree canopy and nutritional status was developed using the orchard as the repeating unit. The results indicate that projected canopy area, evaluated by aerial images, is directly correlated with tree canopy volume, in full developed orchards, as tree height is standardized in every orchard according to the training system. The remote assessment of the tree canopy allows the adoption of differentiated techniques that contribute to better management focused on a greater income to the farmer and, at the same time, contribute to environmental sustainability.

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