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Oral sessions | Farming System | O22: Crop Production System

## [O22] Crop Production System

Chair: Koki Homma (Tohoku University, Japan)

Chair: Roel Suralta (Philippine Rice Research Institute, Philippines)

Thu. Sep 9, 2021 2:30 PM - 4:30 PM Room 2 (Oral) (Farming System)

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3:40 PM - 3:55 PM

### [O22-05] Spatial Variation in the Growth of Peach Trees and the Related Field Properties in a Newly Reclaimed Orchard

\*Nominated for Presentation Awards

○Kaori Matsuoka<sup>1</sup>, Naoki Moritsuka<sup>2</sup>, Ryohei Nakano<sup>3</sup>, Koji Kusumi<sup>3</sup>, Takashi Kurosawa<sup>3</sup>, Mika Yasuda<sup>3</sup>, Tsuyoshi Konishi<sup>3</sup>, Tetsuya Nakazaki<sup>3</sup> (1.Institute for Agro-Environmental Sciences, National Agriculture and Food Research Organization, Japan, 2.Faculty of Agriculture and Marine Science, Kochi University, Japan, 3.Experimental Farm, Graduate School of Agriculture, Kyoto University, Japan)

Spatial variability of field properties in a newly reclaimed peach orchard was assessed to identify the factor affecting spatial variations in tree growth. The orchard (50×20m) is located at Kyoto University Farm in Kizu, Japan, and was planted with 32 'Beni Shimizu' peach seedlings in 2016. In 2019, tree and field properties were evaluated by dividing the field into 32 and 128 plots, respectively. The data were analyzed geostatistically by calculating semivariogram parameters ( $Q$  value and range). Three years after the reclamation, the averages and standard deviations of tree properties were  $21.9 \pm 5.2$  cm for tree trunk length,  $108.3 \pm 21.0$  cm for current shoot length, and  $47.6 \pm 3.0$  for leaf SPAD value. All the properties decreased from southeast to northwest in the field. Among the field properties, tree properties were most strongly correlated with relative altitude ( $R^2$ : 0.65-0.69), which was followed by TDR-EC (0.30-0.61), subsoil pH ( $H_2O$ ) (0.40-0.51), TDR-volumetric water content (0.22-0.56), and soil hardness (0.21-0.53). Tree growth was smaller at the lower position of field where soil EC, pH, and moisture were high, and soil hardness was low. Semivariograms of the field properties showed high  $Q$  values with ranges less than 50m: relative altitude ( $Q$  value: 1.00, range: 34.4m), TDR-EC (0.62, 22.1m), TDR-volumetric water content (0.97, 19.9m), and soil hardness (0.76, 19.1m). The field properties related to tree growth were spatially dependent in the field, thereby allowing site-specific field management for better tree growth.