

## **Utilization of NIRs and Minolta Chromameter in selection for increased carotenoids content in cassava roots**

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Significant progress has been made increasing carotenoids content in cassava roots. The information was used to test the usefulness of NIRs and the Minolta Chromameter in predicting carotenoids content (and other relevant traits). Quantification was made of fresh root tissue (not lyophilized). The dataset (2129 data points) was first cleaned of outlying or suspicious data points to develop reliable prediction equations.  $R^2$  values between NIRs prediction and actual measurements were 0.91 for total carotenoids content (TCC); 0.93 for total  $\beta$ -carotene (TBC), and 0.95 for dry matter content, but is less efficient for cyanogenic potential (0.81). Standard error of cross validation (SECV) for TCC and TBC were (1.191 and 0.837, respectively) while the residual predictive deviations (RPD) were also acceptable (above 3.0). These results suggest that NIRs can be used to reliably predict different variables based on fresh root samples. The Minolta Chromameter can also be used for pre-selection as its  $R^2$  values were 0.58 for TCC and 0.64 for TBC. Relative concentration of different carotenoids and precursors did not suggest the existence of a major blockage in the metabolic pathway towards the synthesis of  $\beta$ -carotene. Once phytoene is synthesized most to the different pigments in the metabolic pathway are found, as expected, in correlated proportions.