APPLICATION OF NEAR-INFRARED SPECTROSCOPY TECHNOLOGY FOR RIPENESS ASSESSMENT IN RASPBERRIES

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Objetive

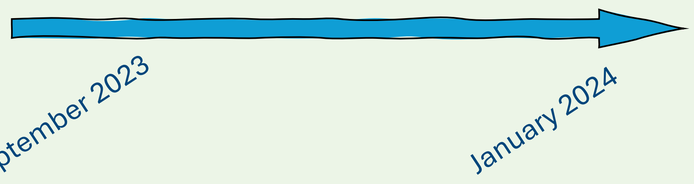
To evaluate the capability of near-infrared reflectance spectroscopy (NIRS) as a rapid and non-destructive tool for monitoring quality control in raspberries.

Material and methods

Samples and Spectra data acquisition

8 raspberry varieties were used, and their spectra were taken individually during the period from September to January in order to collect sufficient variability in the parameters to be predicted.

Luminar 5030 NIR analyzer (Brimrose Corporation, Baltimore, USA

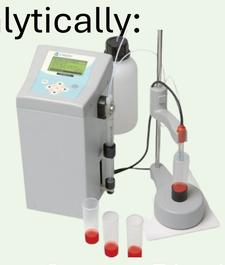


Physicochemical determinations

The parameters of greatest interest for determining the optimal ripening stage of raspberries were determined analytically:

- ❑ Total soluble solids (TSS)
- ❑ Acidity
- ❑ Ratio between TSS and acidity.

ATAGO PR-101 (Atago Co., Ltd., Tokyo, Japan



(Crinson Compact Tritrador - version S (Crison Instruments, S.A., Barcelona, Spain)

Quantitative models

The development of the quantitative models was carried out using the partial least squares (PLSR) algorithm (CAMO® Unscrambler X vs 10.5 software), using the absorbance spectrum. The quantitative models were evaluated based on the **cross-validation coefficient of determination (1-VR)** and the **root mean square error after cross-validation (RMSECV).**

Results

Predictive model for TSS

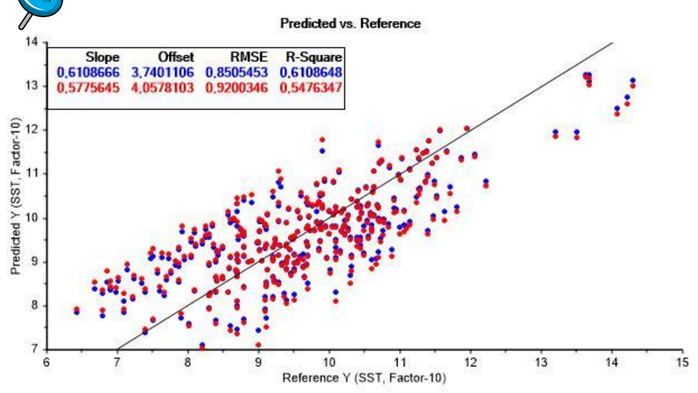


Figure 1. Predicted versus real TSS values

Predictive model for Acidity

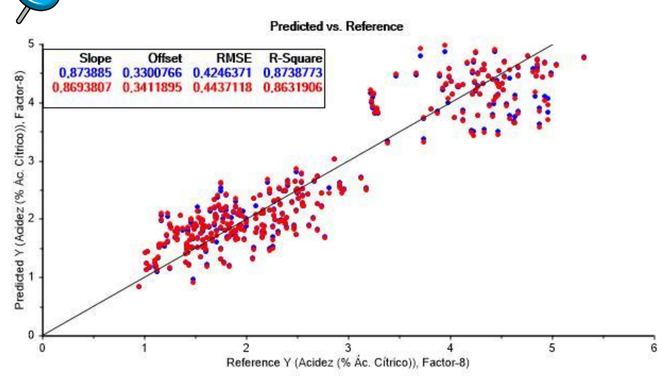


Figure 2. Predicted versus real Acidity values

Predictive model for Ratio between TSS and acidity

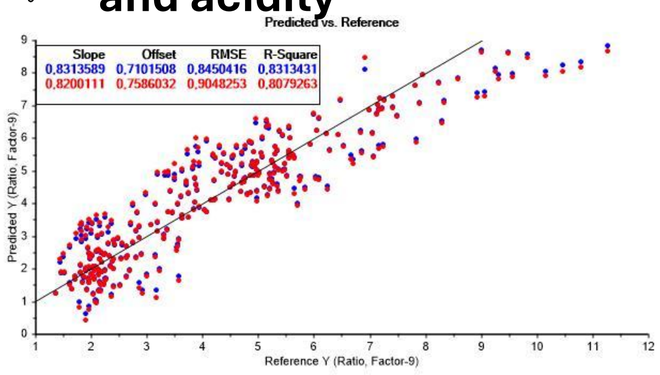


Figure 3. Predicted versus real Ratio between TSS and acidity values

Conclusion

NIRS technology could be a fast and non-destructive tool to quantify physicochemical parameters of interest in raspberries, supporting the ability of this technology to be considered in any digital transformation strategy related to quality control.

Acknoledgements

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