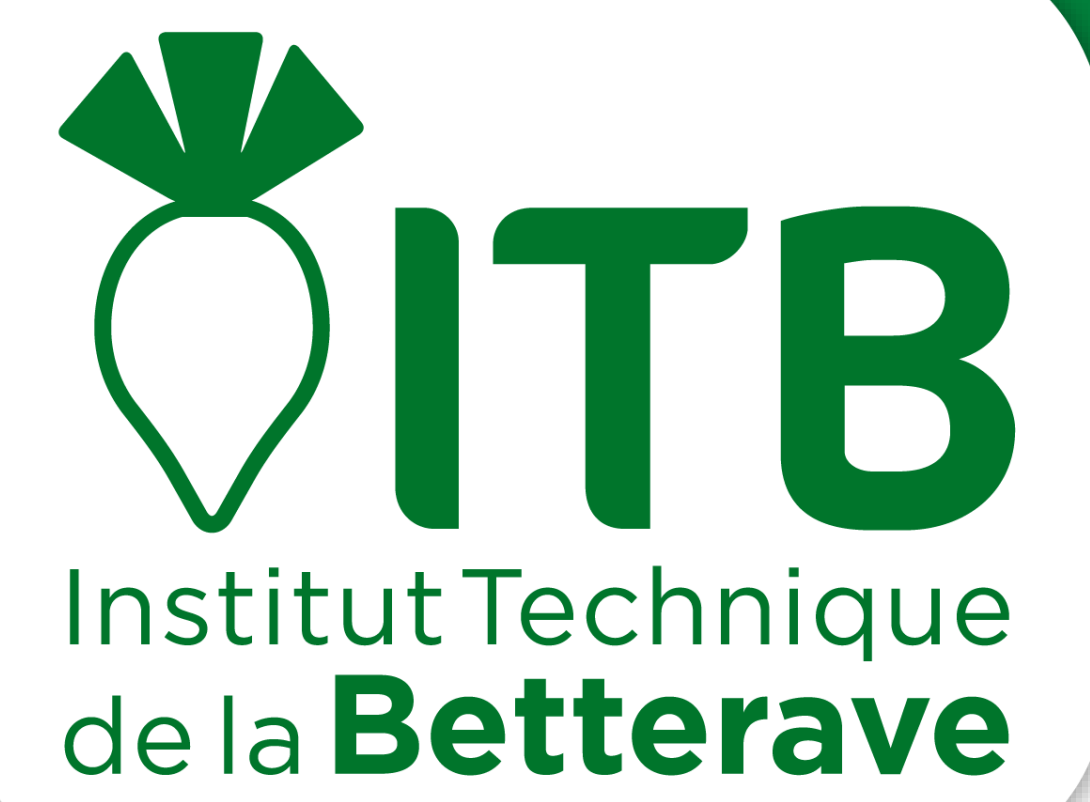# Assessing the potential of a handheld VNIR microspectrometer for sugar beet phenotyping

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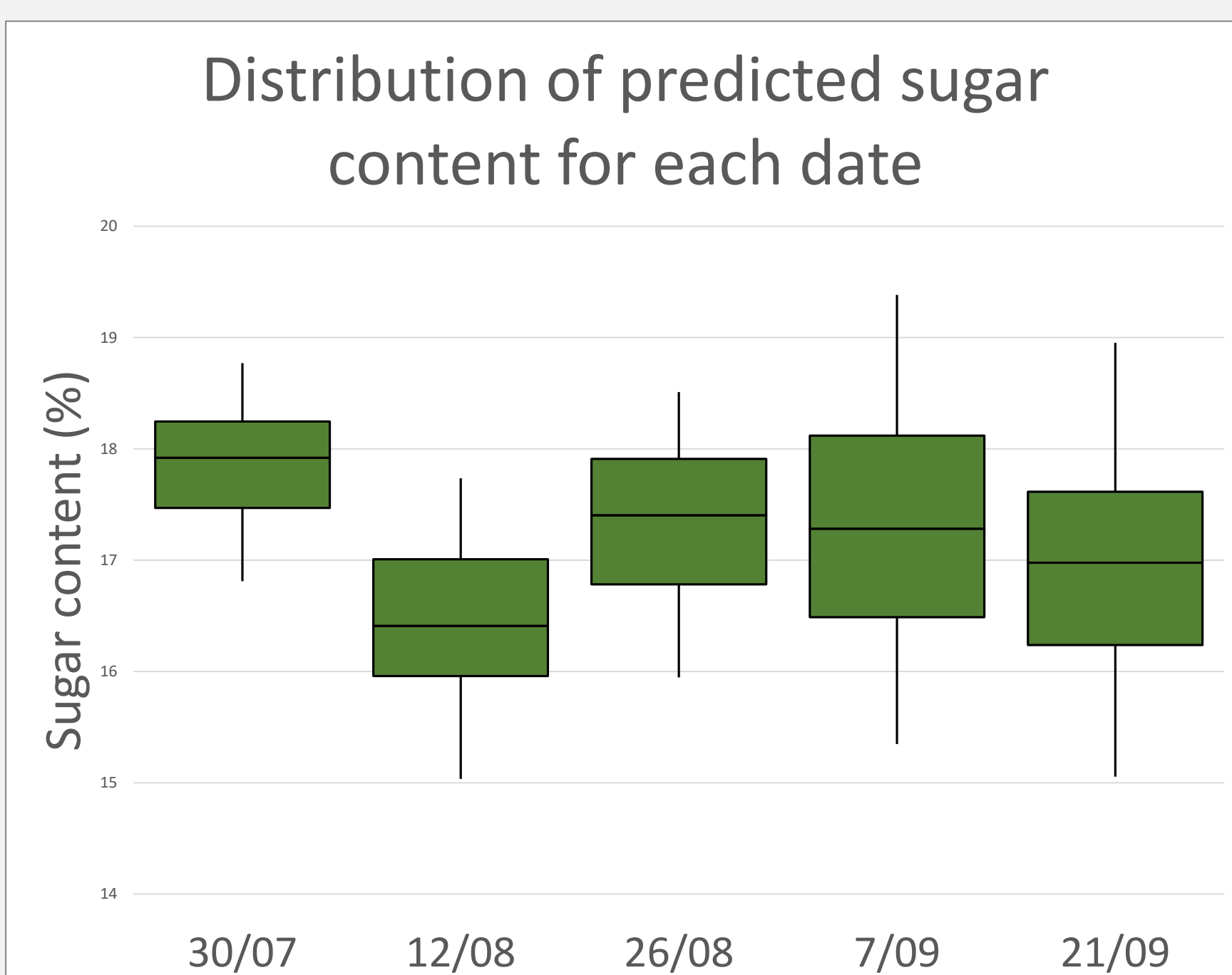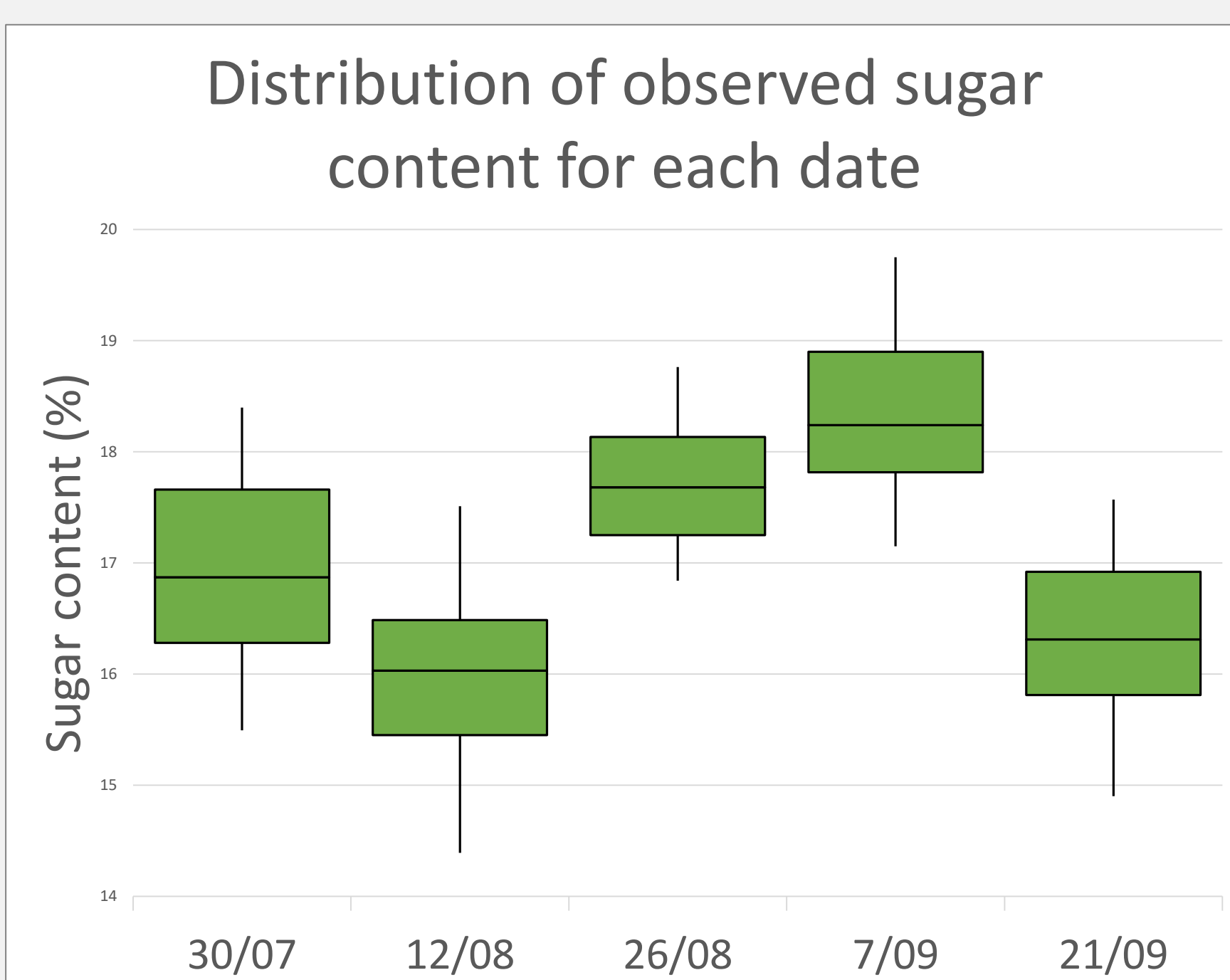
From sugar beet to spectra

- **Non destructive**, fast and cheap measurement

- Data acquired from 2017 to 2021

- More than **5000 spectra**

- Various **varieties** and **nitrogen** supply

- Normalization and pre-processing of spectra

From spectra to sugar content estimation

- Partial Least Squares Regression Model (PLS)

- Calibration on 2017-2020 data series and Prediction of 2021 data series

- Standard error of prediction (SEP) = **1.27 sugar content point**

- Pearson correlation coefficient = **0.63**

Comparison of observed sugar content according to predicted sugar content
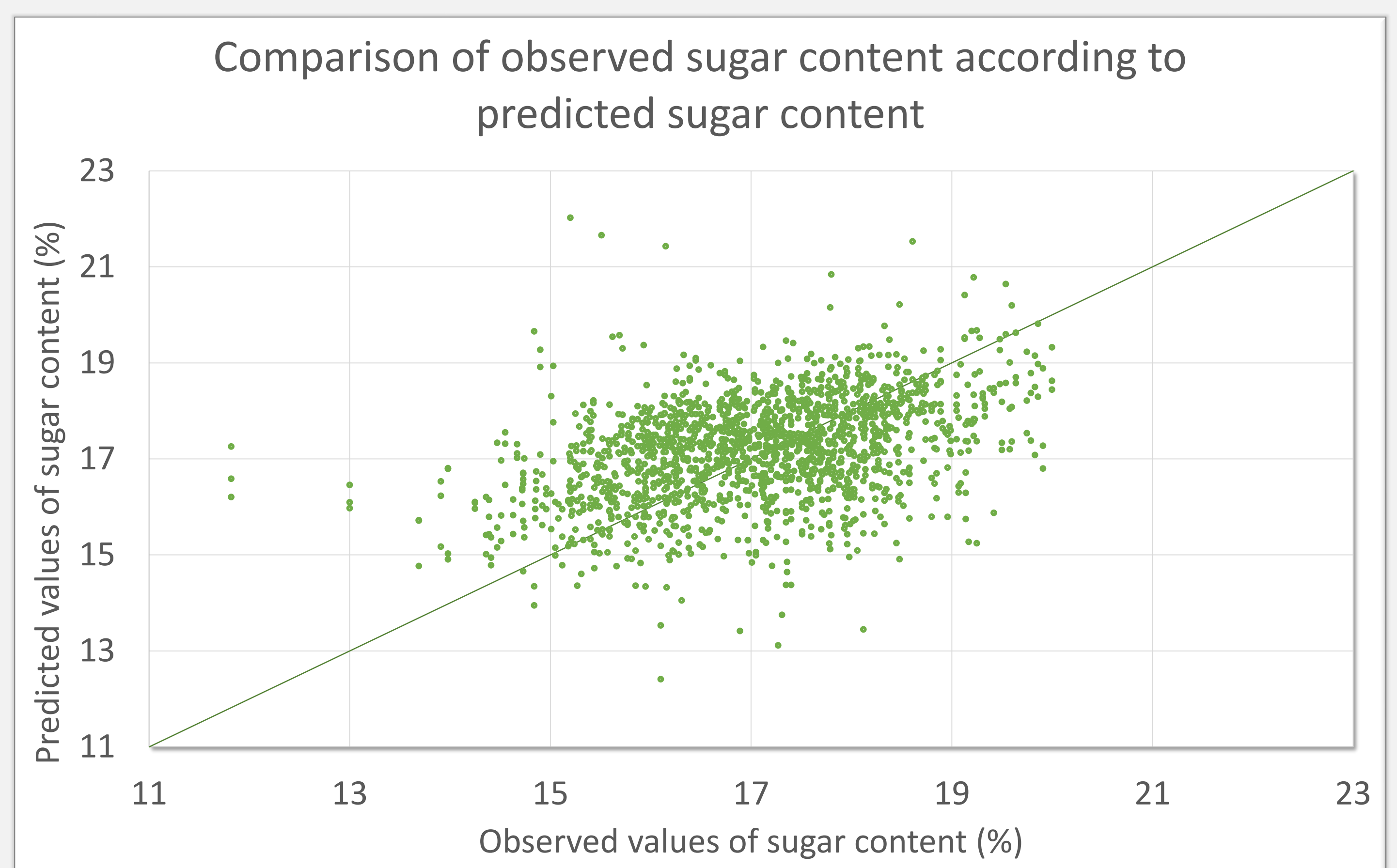
From sugar content estimation to practical use

Distribution of observed sugar content for each date

Distribution of predicted sugar content for each date

- **Temporal monitoring** of beet sugar content

- Observed sugar content dynamics **correlated to rainfall**

- **Simulation of kinetic** of beet sugar content thanks to the PLS model

- Simulation of beet sugar content for each of the **varieties**

- Show **varietal differences**

- Interesting use to identify **varietal behaviours**

Observed and predicted sugar content depending on variety