

## HIP-BB1.5 'Metabolomics of seed potatoes during storage'

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The aim of this project is to follow the biochemical changes occurring during the storage of potato tubers and investigate how this relates to growth and storage conditions across several seasons. The project started late 2019 and initially involved a pilot analysis and optimization of the technologies and materials in preparation for subsequent years research.

### Highlights:

- Seed potatoes from 4 cultivars have been used to adapt and optimize existing protocols for comprehensive LCMS-based metabolomics; a pilot test showed clearly detectable effects of either 7-weeks cold storage at 4°C or 5-weeks 'warm' storage at 15°C on the tuber metabolite composition, indicating that our metabolomics approach is indeed suitable to study storage-related biochemical changes and provide chemical markers for viability and quality of stored seed potatoes, as described in the research plan. See Figure 1.
- A large long-term storage experiment of tubers of the same 4 cultivars at 2 storage temperatures in 3 biological replicates has been started in November 2019 (separate project at WU - Crop Systems Analysis); first season tubers delivered by HZPC are now in storage and are currently being sampled every 4 weeks and delivered to WUR-Bioscience for metabolomics analyses. These will be performed after the last samples have been obtained.

### Planning 2020:

- Q1: Continuing 4-weeks sampling of tubers from the long-term cold storage experiment.
- Q2-Q3: Metabolomics analyses of all tuber samples; relating these metabolite data to seed tuber quality aspects (WUR- Crop Systems Analysis).
- Q4: harvest tubers and start new storage experiment

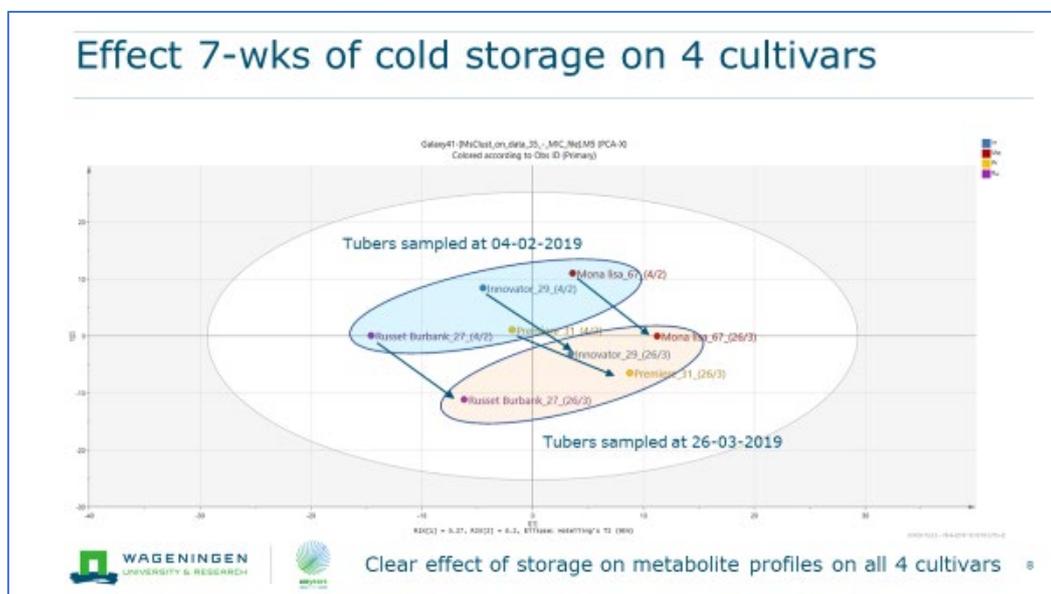


Figure1: Principal Component Analysis (PCA) of seed potatoes from 4 cultivars before and after 7 weeks of cold storage, based on their metabolite profiles determined by LCMS. For all cultivars a clear storage-related change in tuber metabolite composition is observed.

Conclusions: Project has made an excellent start, the necessary protocols are in place and the proof of concept experiment was successful. The project is fully on schedule.