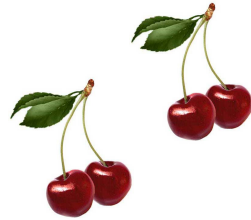


Postharvest quality

Andreas Bühlmann

Agroscope, KB PPP

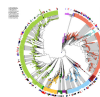


Microbiome study on low input trial

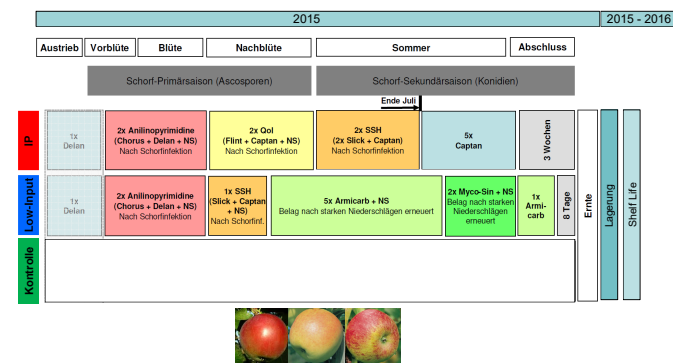
6. MICROBIOME

Set up and aim

- Existing Low residue trial
- Characterize microbial load on apples from harvest to retail
- Can we predict pathogen damage before symptoms appear – focus on *Neofabraea*
- Can we identify ideal biocontrol mixtures



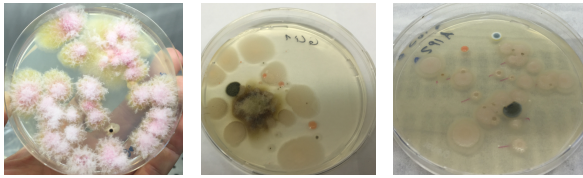
Orchard management and apple variety



Orchard management and apple variety

Agar plates

Varieties	Okt 15	Nov 15	Dez 15	Jan 16	Feb 16	Mrz 16	Apr 16	Mai 16	SL 7d	SL14d
Ariane	A	A	A	A	A	A	A	A	A	A
Otava	C	C	C	C	C	C	C	C	C	C
Topaz	D	D	D	D	D	D	D	D	D	D

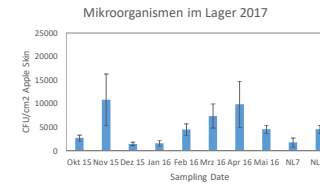
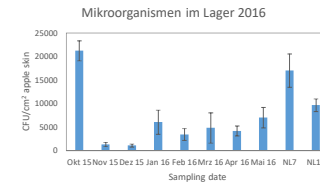
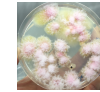


Count colonies, possible but difficult

EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

5

Results

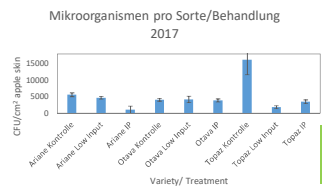
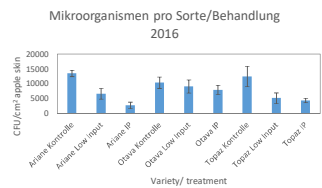


The microbiome changes
• During storage
• Between years

EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

6

Results

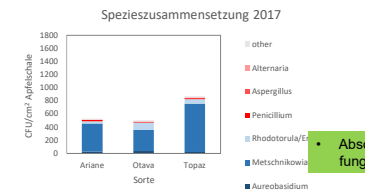
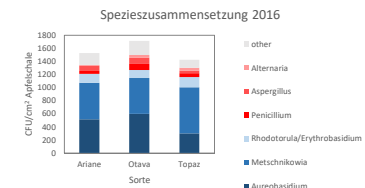


• Varietal differences
• Orchard management differences

EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

7

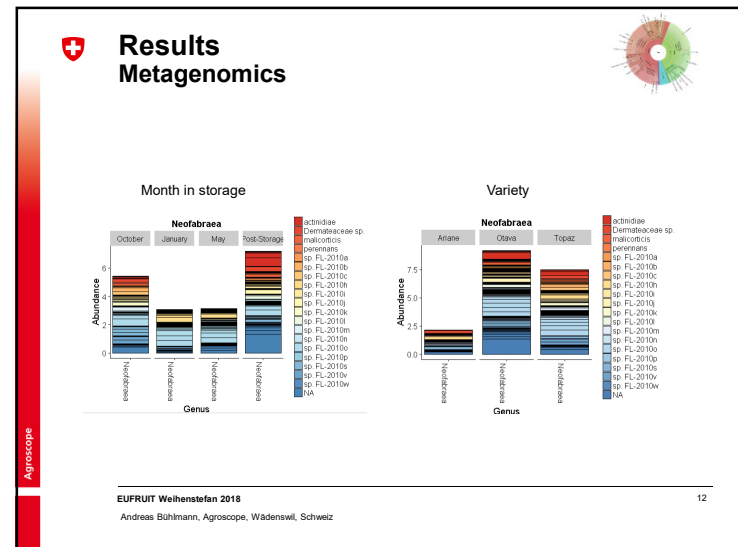
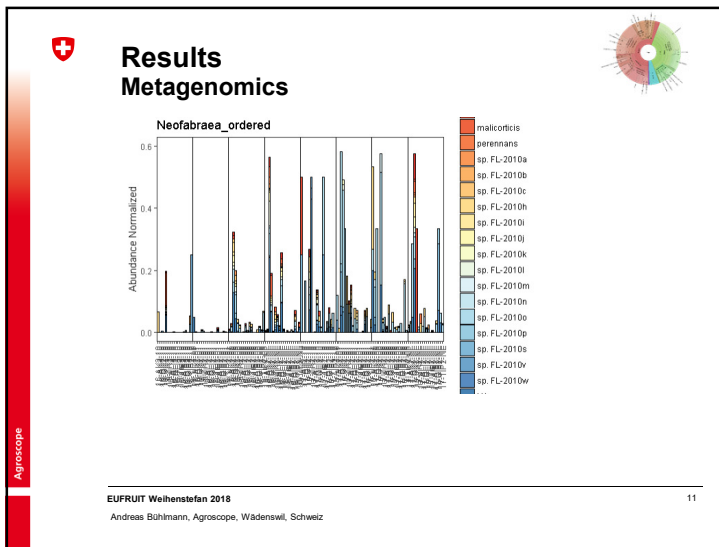
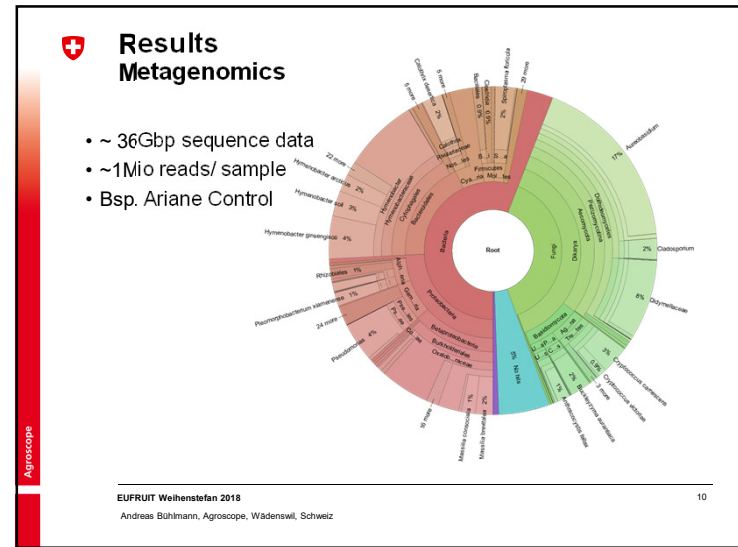
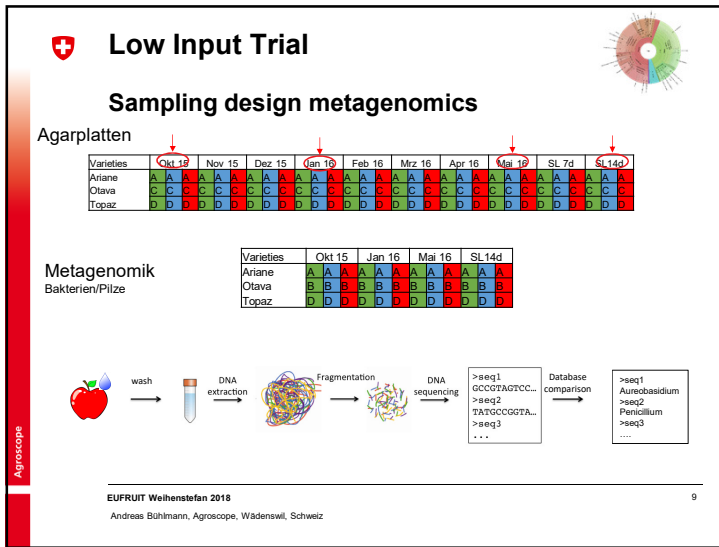
Results Microbiology

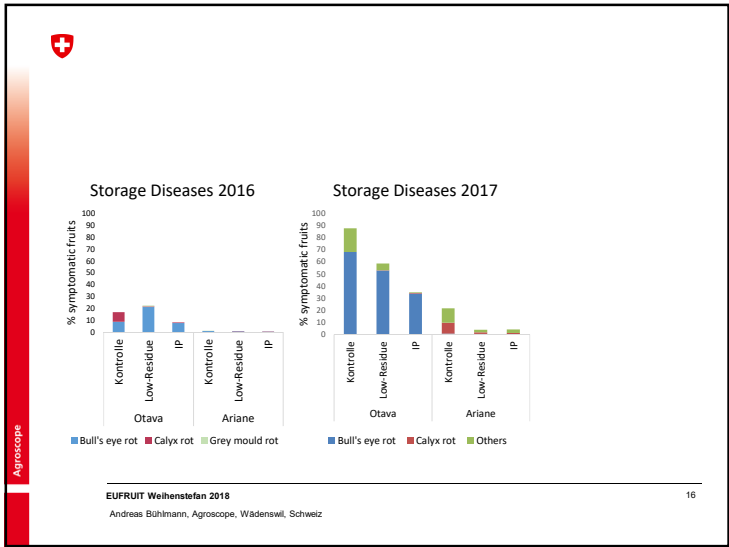
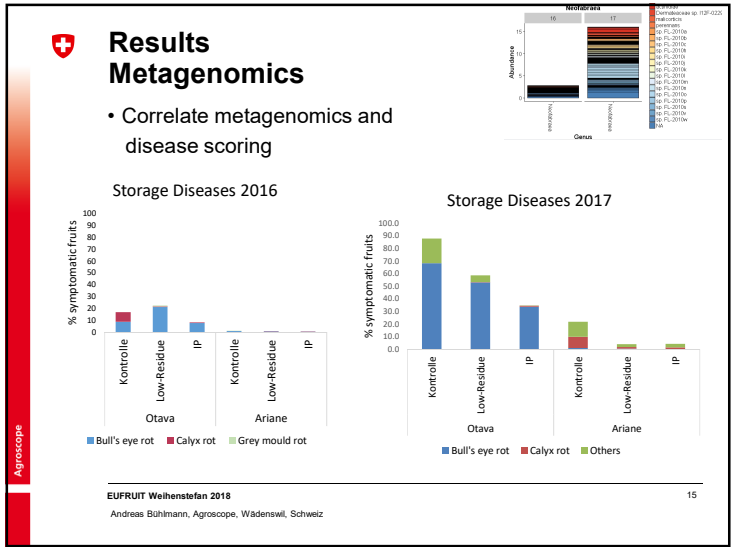
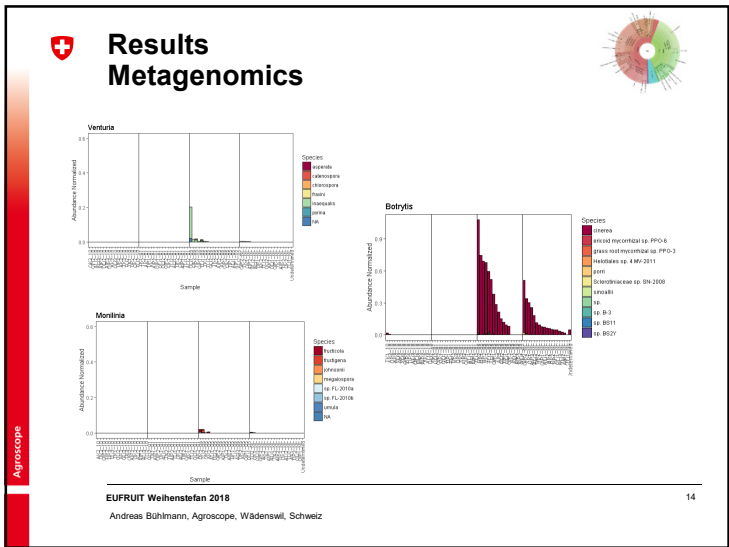
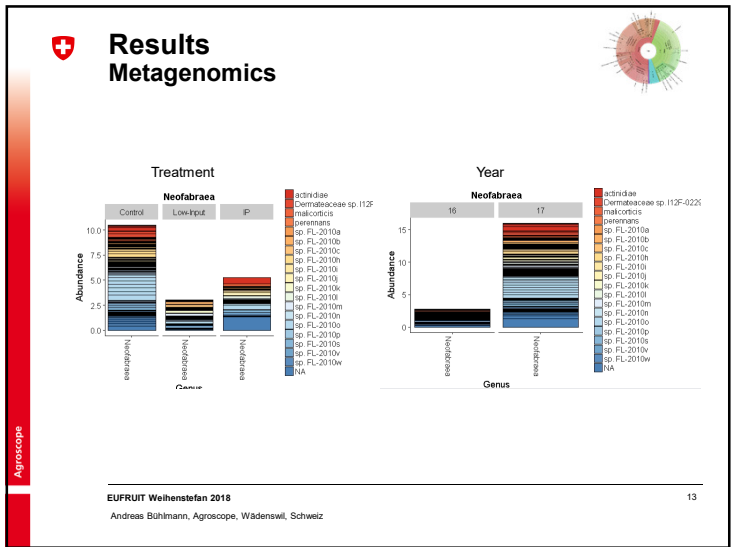


• Absolute amount and fungi/yeast ratio changes

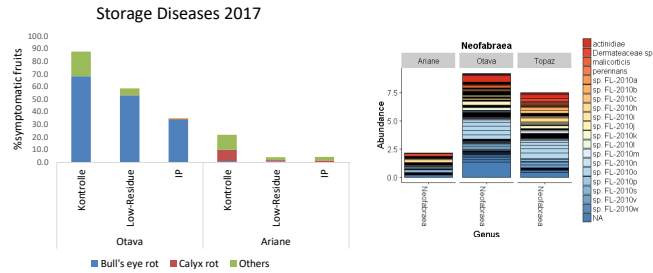
EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

8





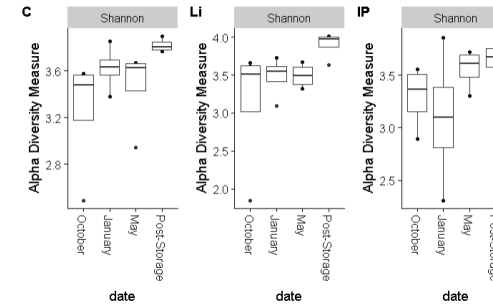
Results Metagenomics



EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

17

Results Metagenomics

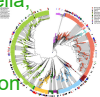


EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

18

Aims and outlook

- Characterize microbial load on apples from harvest to retail- **YES**, For post harvest- now do the same from blossom to harvest
- Can we predict pathogen damage before symptoms appear – focus on *Neofabraea*. **Yes**, metagenomics too expensive >100 evaluate qPCR, LAMP >1000
- Can we identify ideal biocontrol mixtures- **Yes**- Field trials with *Aureobasidium*, *Metschnikowia* (known) explore *Dydymella*, *Pseudomonas*, *Hymenobacter* etc.
- Characterise *Neofabraea* strains better: In vitro competition assays, genome sequencing, etc.

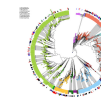


EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

19

Aims and outlook

- How does the microbiome compare on a national scale
- 2year «field trial» with swiss growers (first results q4-2018)
- How does the microbiome compare on a global scale
participate in global study on golden gala (results q4-2018)



EUFRUIT Weihenstephan 2018
Andreas Bühlmann, Agroscope, Wädenswil, Schweiz

20