

# Variability in the wild species of *T. koksaghyz* as measured via several analyses techniques

Montpellier, October 15th



# Aim plant analysis



- How do we deal with the large variation?
  - How large is the variation?
  - How does it influence measurements methods?
  - How does it influence extraction?
  - How does it correspond with genetic data?
- How can we measure rubber content?
  - Preferably fast & cheap
  - Preferably non-destructive



# Approach



## ■ Representative selection of 11(or 12) plants

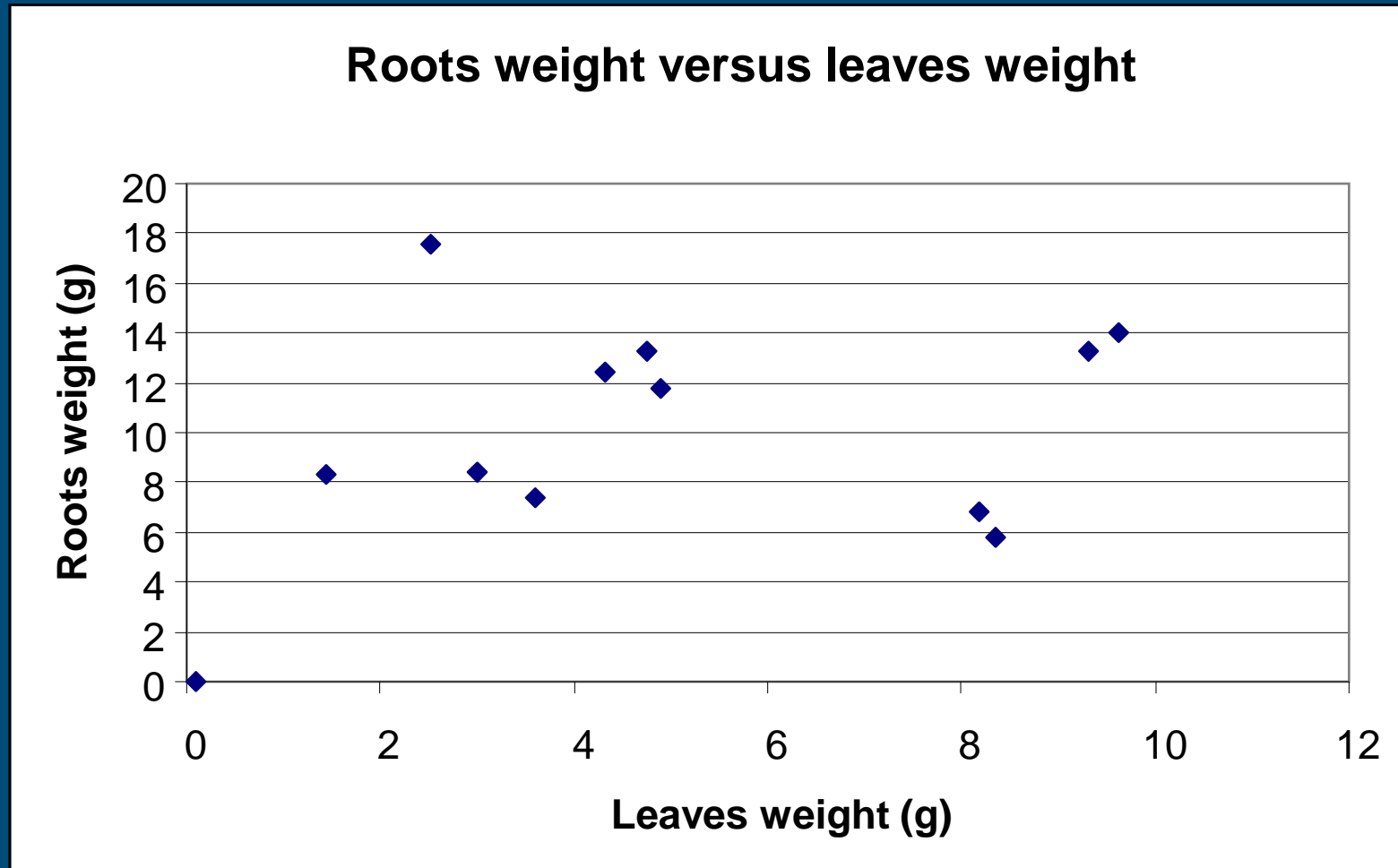
- Measure plant sizes
- Measure rubber production
  - Measure latex concentration, Münster method, **non-destructive**
  - Quantify rubber threads, breaking test, **quick screening**
  - ASE (Accelerated Solvent Extraction), **rubber yield per plant**



# Plant variation



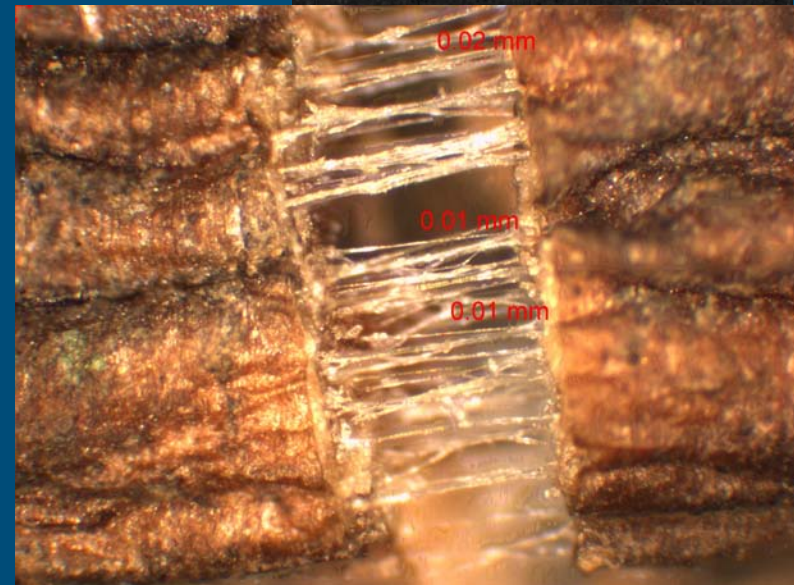
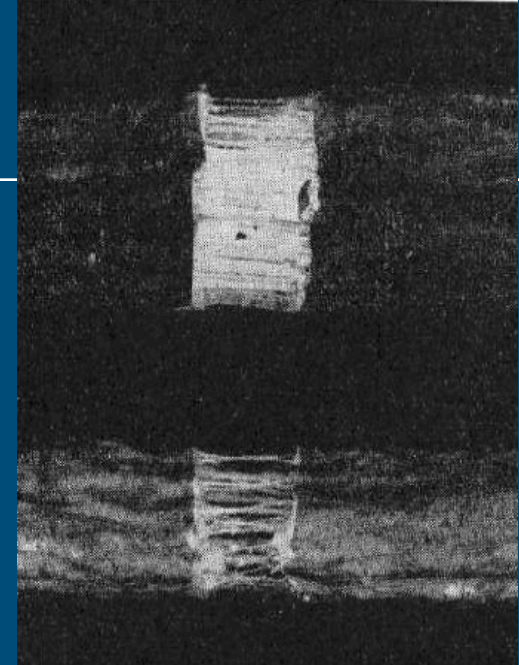
# Leaves/roots variation



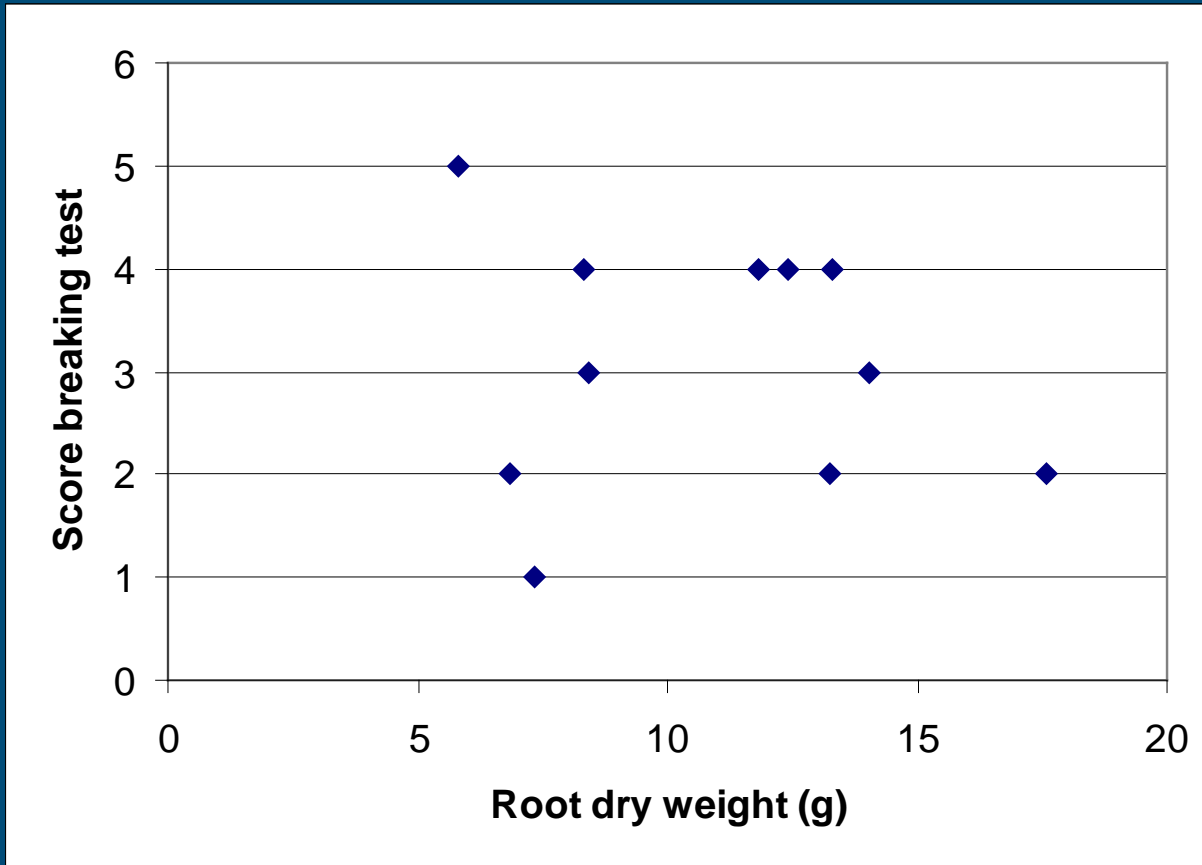


# Breaking test

- Pictured by Josefsson
- Very quick method!
- Threads formation used in extraction processes
- No information on potential rubber yield
- Influence of root size?
- How quantify?
- How standardize?
- Pictured by Vredestein!!



# Rubber threads versus root dry weight



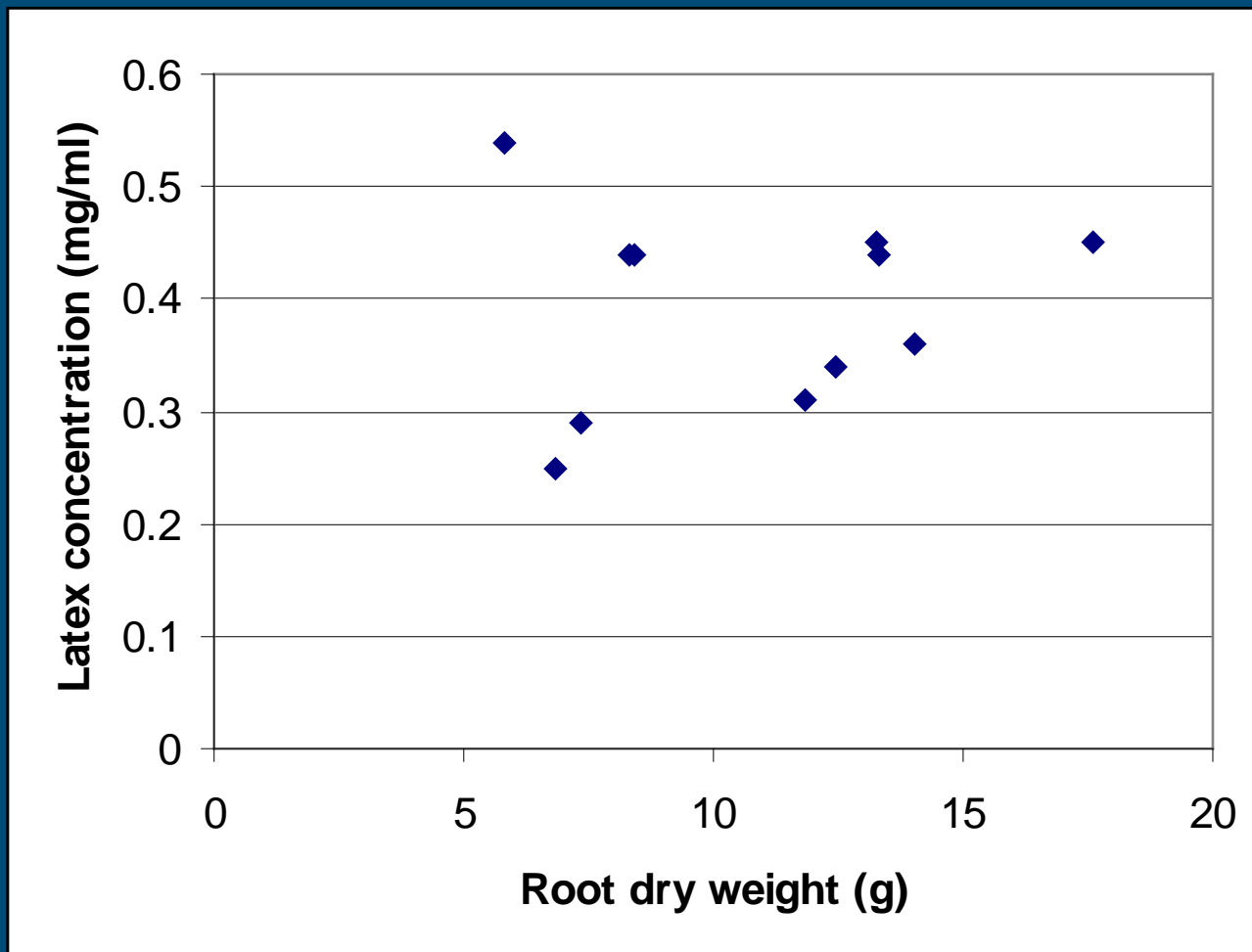
# Latex concentration

- Developed by University of Münster
- Measures concentration rubber in latex
- Non destructive
  
- Can we correlate this with the rubber production per plant?





# Latex concentration



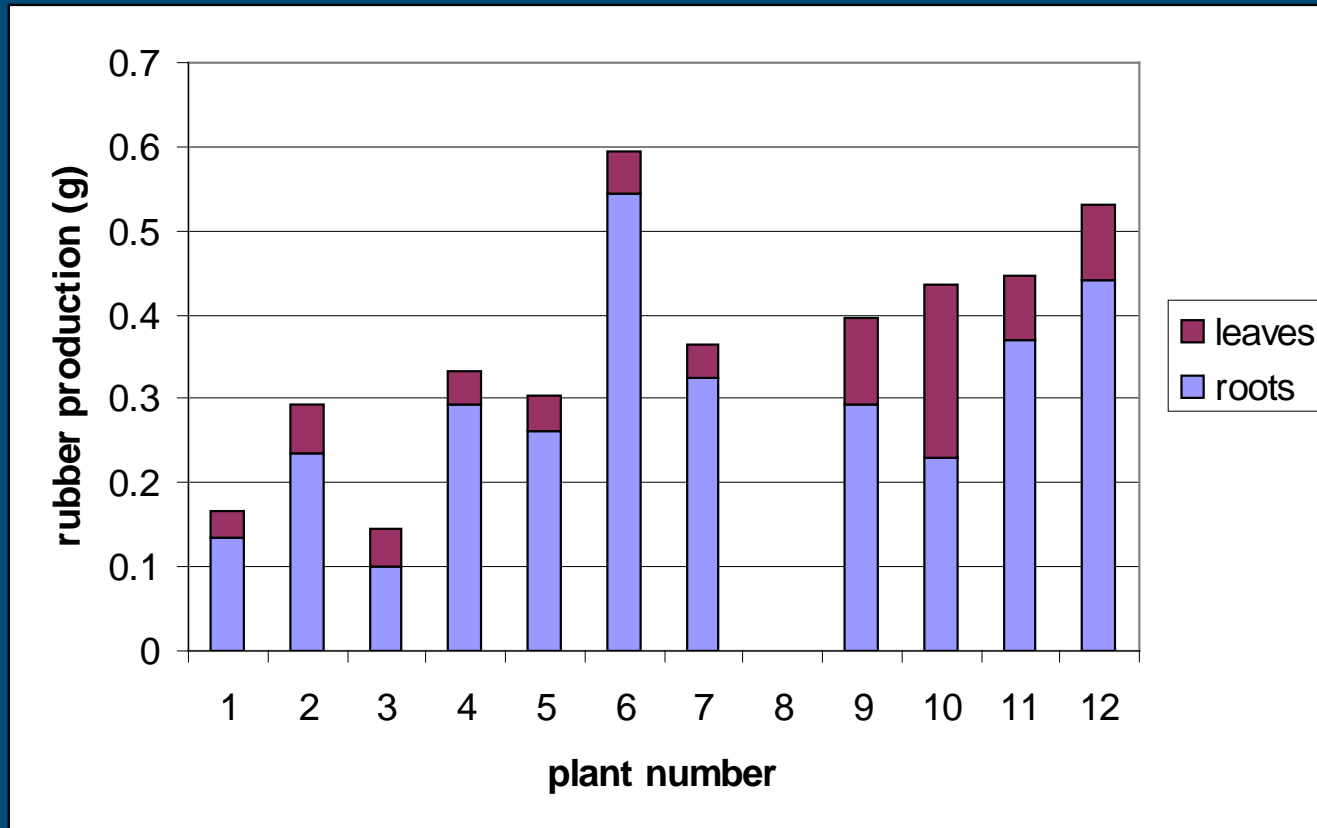
# Accelerated Solvent Extraction



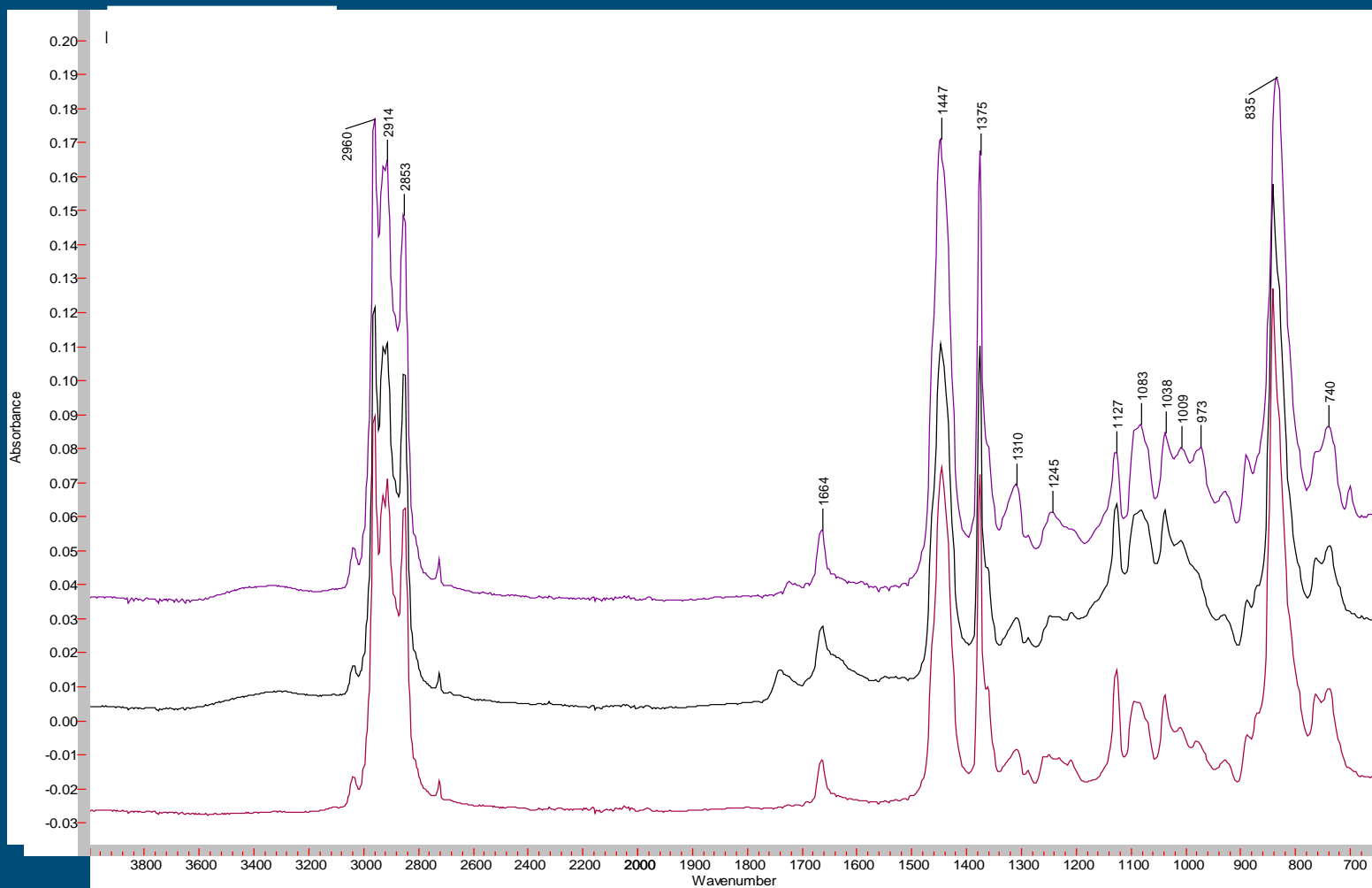
- Chemical extraction of milled roots (and leaves)
- Measures rubber content/dry root
- Samples entire root
- Labour-intensive
- Suitable to calculate yields



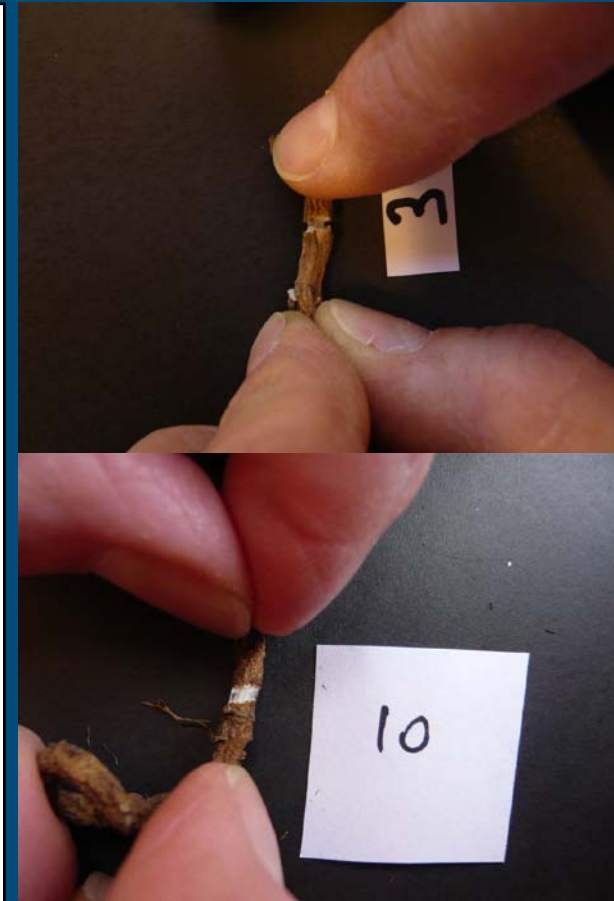
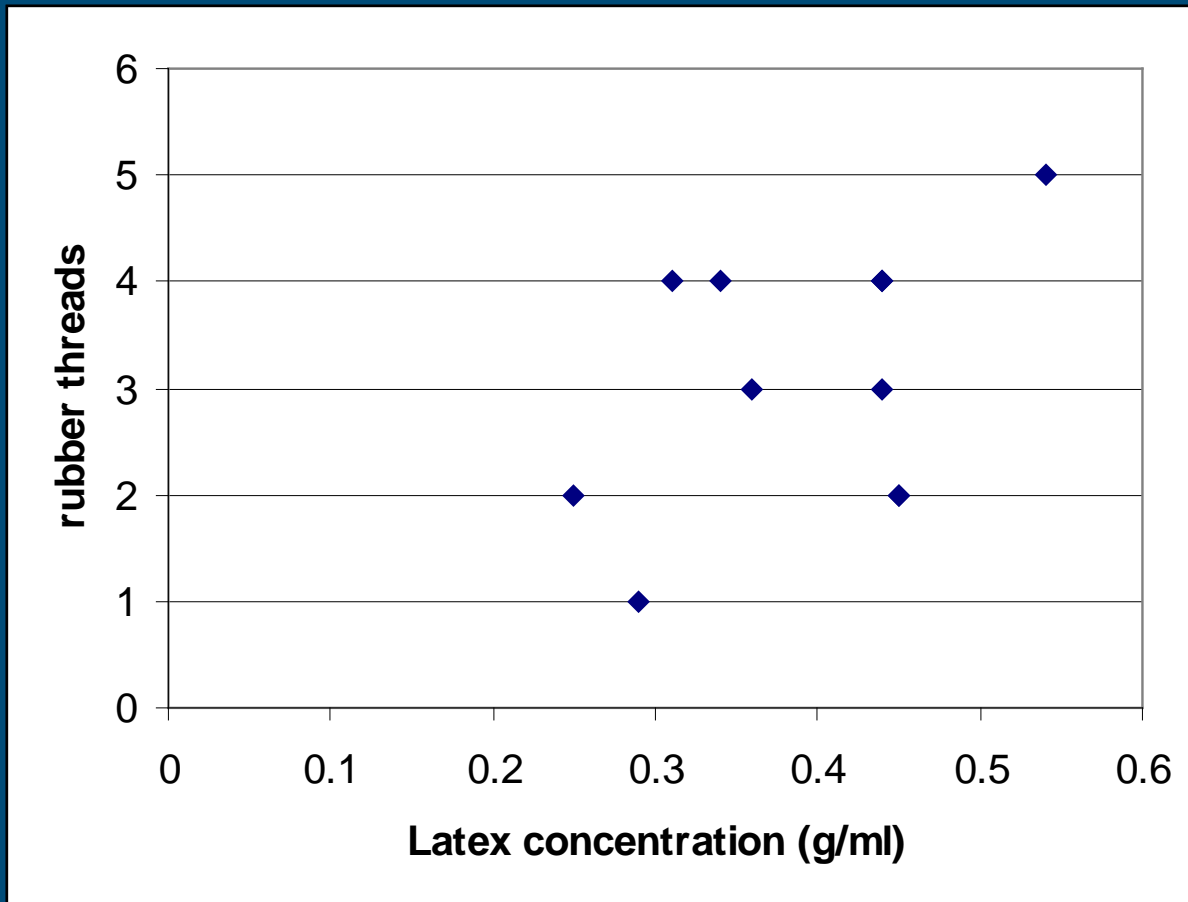
# ASE results, g rubber extracted /plant



# FTIR analysis

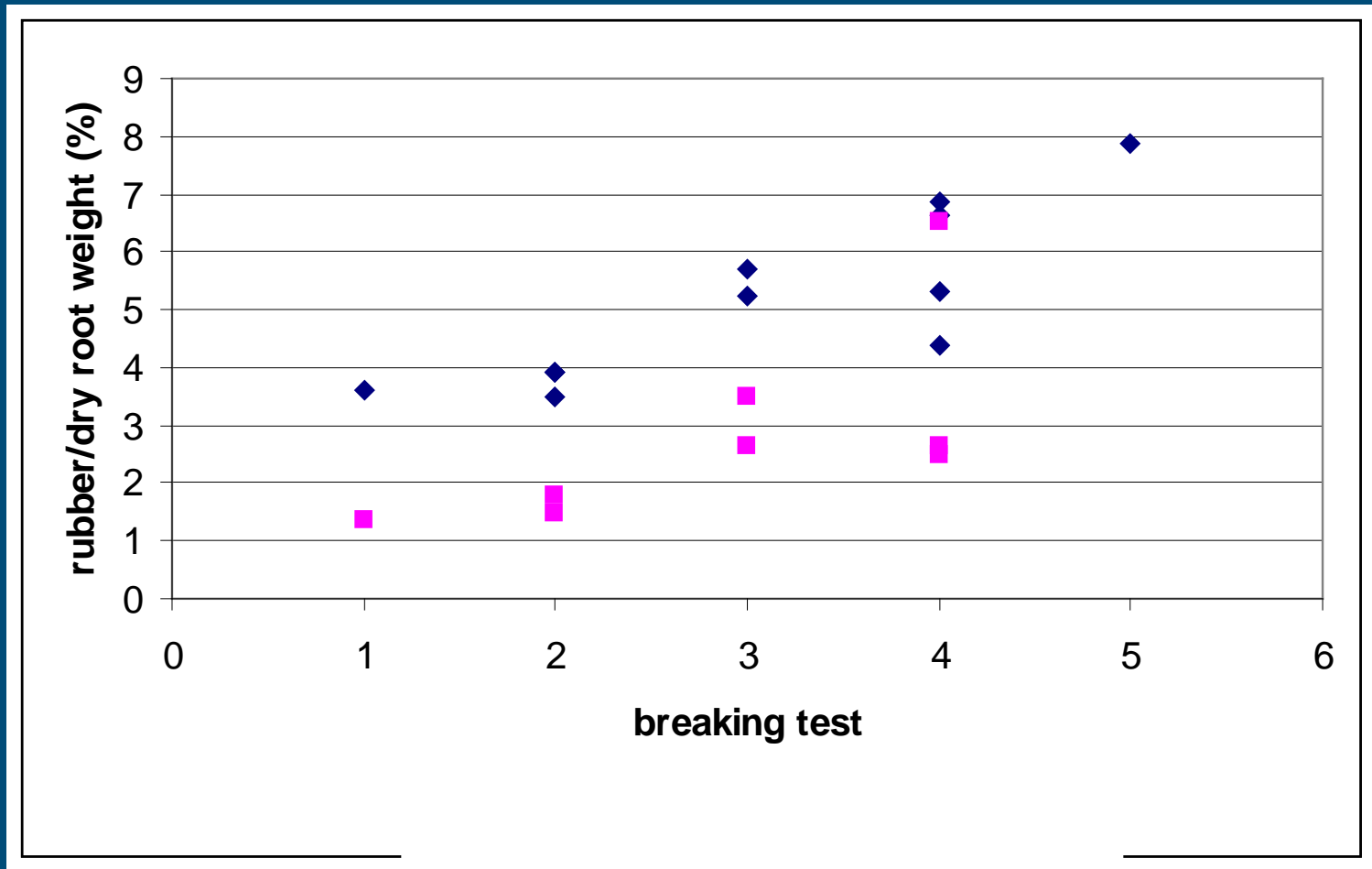


# Rubber threads versus latex concentration





# ASE versus breaking test



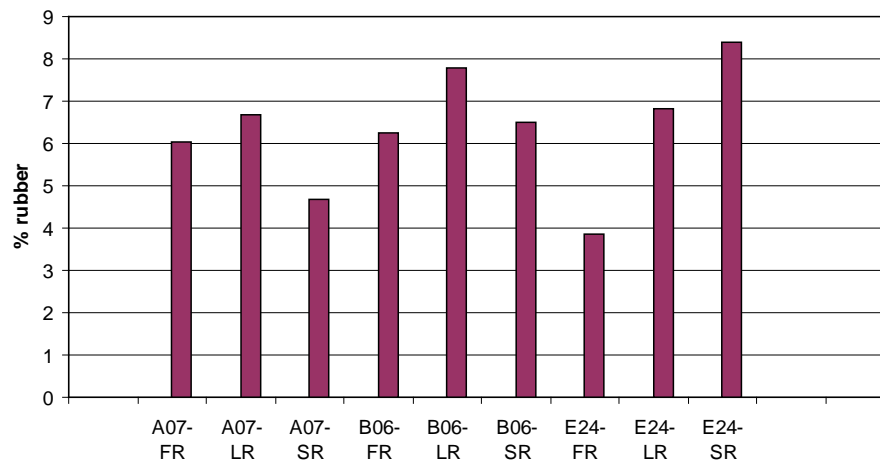
# Conclusions plant analyses

- ASE only method that quantifies rubber content
- Best correlation between ASE and breaking test

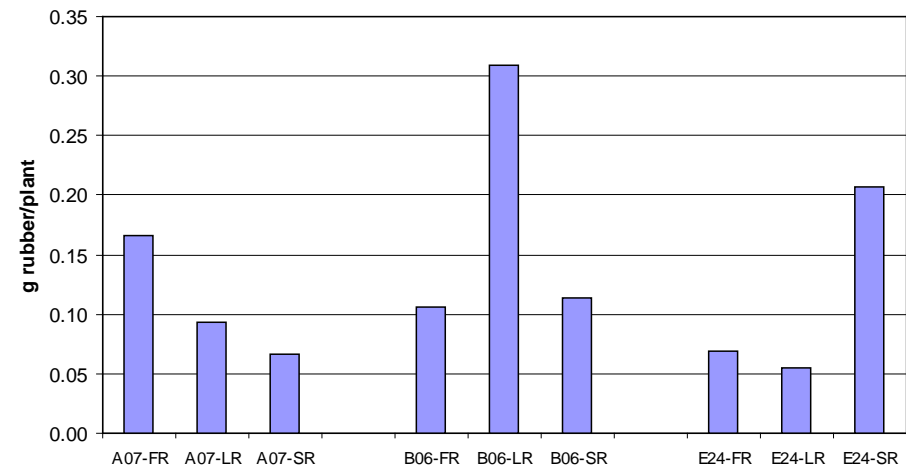


# Rubber distribution over roots

Keygene roots fractions and pulp fractions



total rubber content in root fractions



# Conclusions

- Did you find a lot of variation? Yes
  - In everything we measured
- Did you find a non destructive method? No
  - You have to dig out the plant to weigh the roots
  - You have to measure the rubber in the complete root system
- Did you find a quick method? No
  - Although the breaking test does give you information it can be misleading



# Many thanks!!!

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