LIÈGE université
Gembloux
Agro-Bio Tech

SOPHIE @ Lublin2020

Ring test – state of affairs, first results, questions and follow up

Challenge for soil physics labs

- Soil physics laboratories aim to quantify the hydrophysical properties of soils (like a.o. retention and conductivity)
- These properties are mainly structure-dependent
- There is no guarantee that two laboratories would give the same result on the same soil

- The challenge of soil physics is to work on **undisturbed samples**
- **SOPHIE demonstrates the need for interlab comparison**

After Gembloux meeting we identified 3 issues with increasing levels of complexity

- To ensure the **reproducibility** of a given protocol, over time, within a laboratory;
- To ensure **consistency** between analyses performed using the same protocol in different laboratories;
- To ensure consistency **(harmonization)** between similar hydro-physical characterizations performed with different protocols in different laboratories

It became obvious that we needed

- Reference samples
  - After a quick benchmarking, we identified a good candidate thanks to UGent (Wim Cornelis and Maarten Volckaert)
- A (several) ring test(s)

Wet end of the WRC - 1st ring test (ever)

- Rings provided by Eijkelkamp
- Reference sample[1] & « recipe » provided by UGent
- 14 labs involved

[1] mix of glass beads and cement

Participants

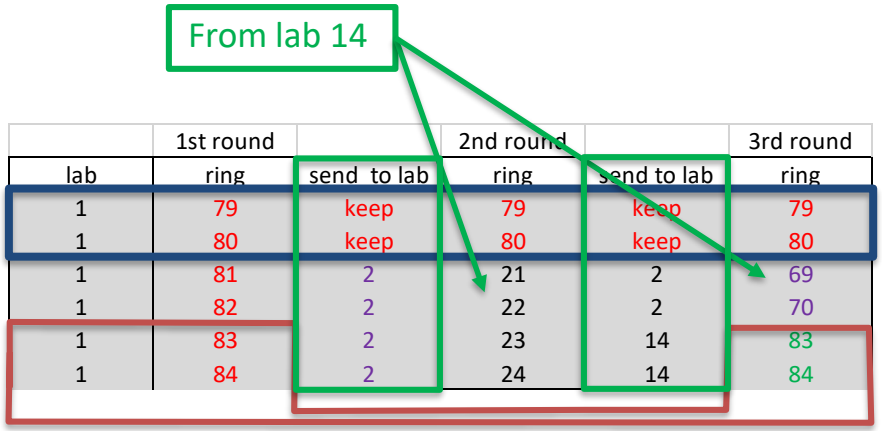
- Wageningen UR, The Netherlands
- University of Liège - Gembloux Agro-Bio Tech, Belgium
- Ghent University, Belgium
- UCLouvain, Belgium
- Institute of Research for Development (IRD), France
- Technische Universität Braunschweig, Germany
- University of Hohenheim, Germany
- Forschungszentrum Jülich GmbH, Germany
- Federal Institute for Geosciences and Natural Resources, Germany
- Aarhus University, Denmark
- SLU (Swedish University of Agricultural Sciences), Sweden
- Norwegian Institute of Bioeconomy Research, Norway
- Polish Academy of Sciences (PAS), Poland
- Hungarian Academy of Sciences, Hungary

Wet end of the WRC - 1st ring test (ever)

- Saturation
  - Saturation time: 48h (in box with water: water level incrementing at regular time intervals with 2 cm steps)
  - Water used: demineralized water
  - Presence of a bottom cloth: yes
  - Presence of a lid: yes
- mass measurement at 4 points of the retention curve
  - Equilibration time :
    - 10 hPa : 5 days -> mass measurement
    - 50 hPa : 7 days -> mass measurement
    - 100 hPa : 10 days -> mass measurement
    - 300 hPa : 15 days -> mass measurement
- drying :
  - 72h at 60°C
  - mass measurement

Wet end of the WRC - 1st ring test (ever)

- 3 rounds of measurements, 84 samples



	1st round		2nd round		3rd round
lab	ring	send to lab	ring	send to lab	ring
1	79	keep	79	keep	79
1	80	keep	80	keep	80
1	81	2	21	2	69
1	82	2	22	2	70
1	83	2	23	14	83
1	84	2	24	14	84

Are the measurements on a same sample stable in a given lab?

Are the samples affected by transfers between labs?

Are same samples giving the same data in different labs?

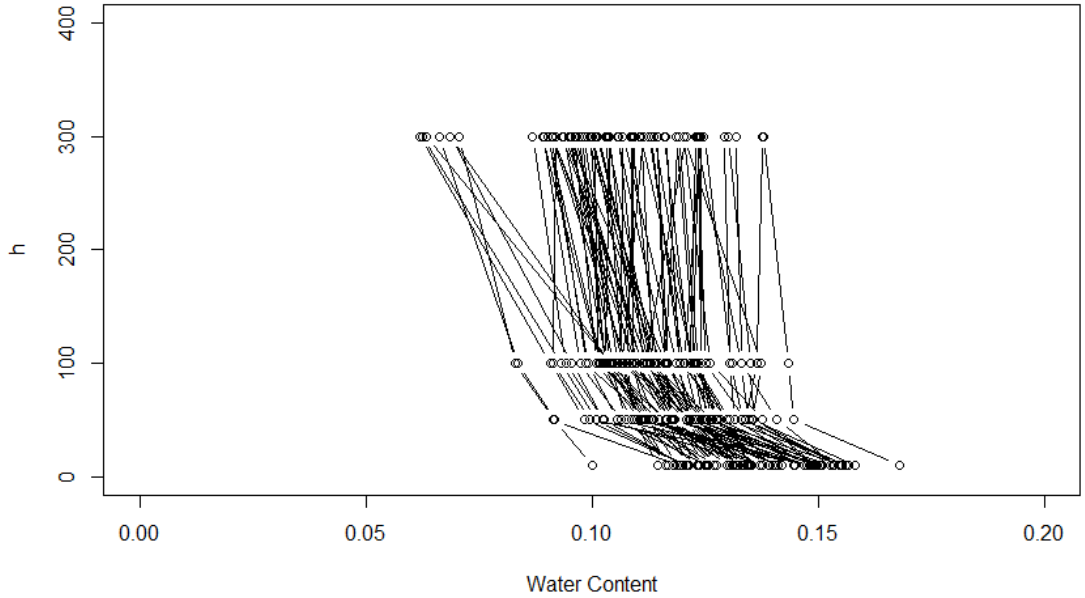
State of affairs

- Labs received the samples in June
- End 2019, 13 labs finished the first round
- 3 labs finished the second round
- Since samples travel between labs, the second round will start when the last lab finishes
- A round lasts for 40 days

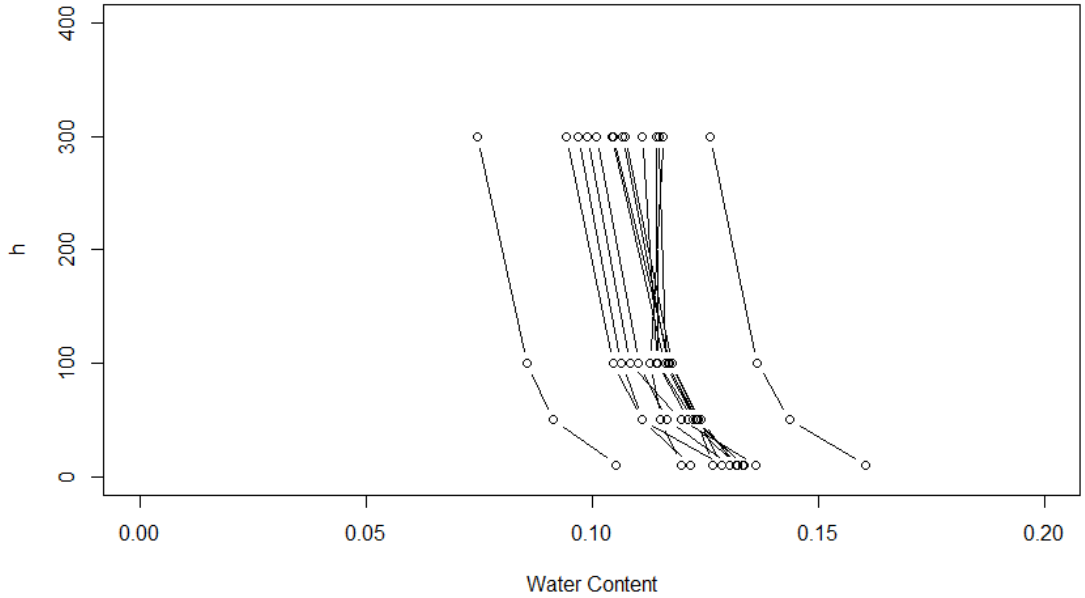
Sample preparation and measurements

- Loss of material during construction of the samples
- Difficulties to have a flat side & perfect contact
- Drying time maybe not sufficient & possible error on water content calculation
- Some labs reported errors/drift in pressure regulation
- Level of pressure regulation considering bottom/center of the sample

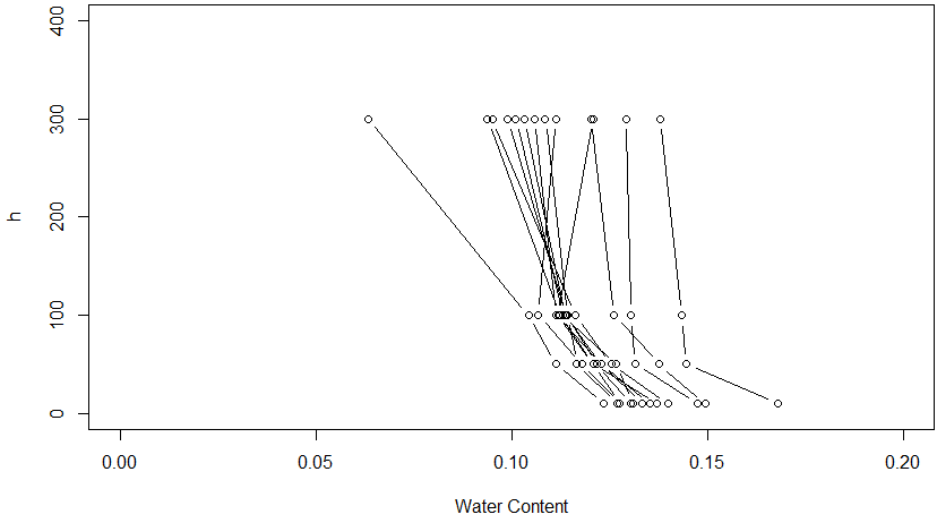
First results…. First round 78 samples

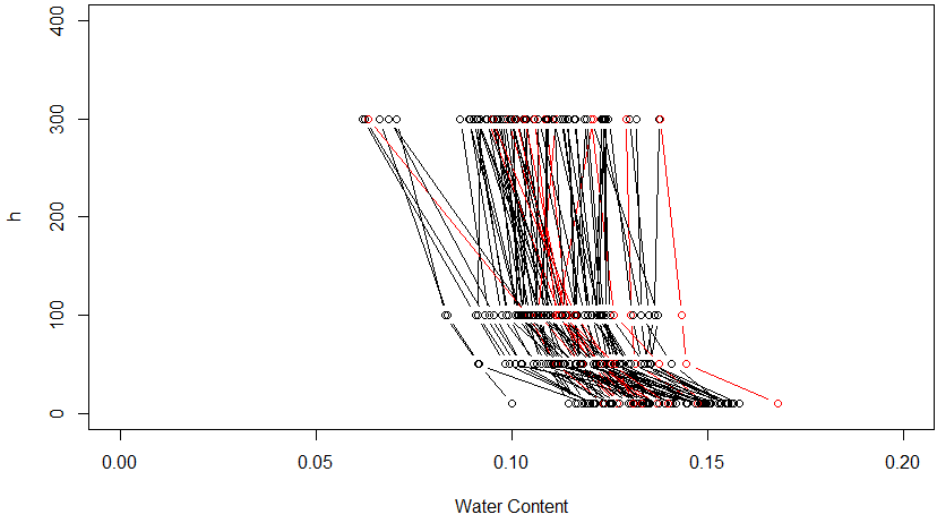


Second round (14 samples)



The samples built by UGent

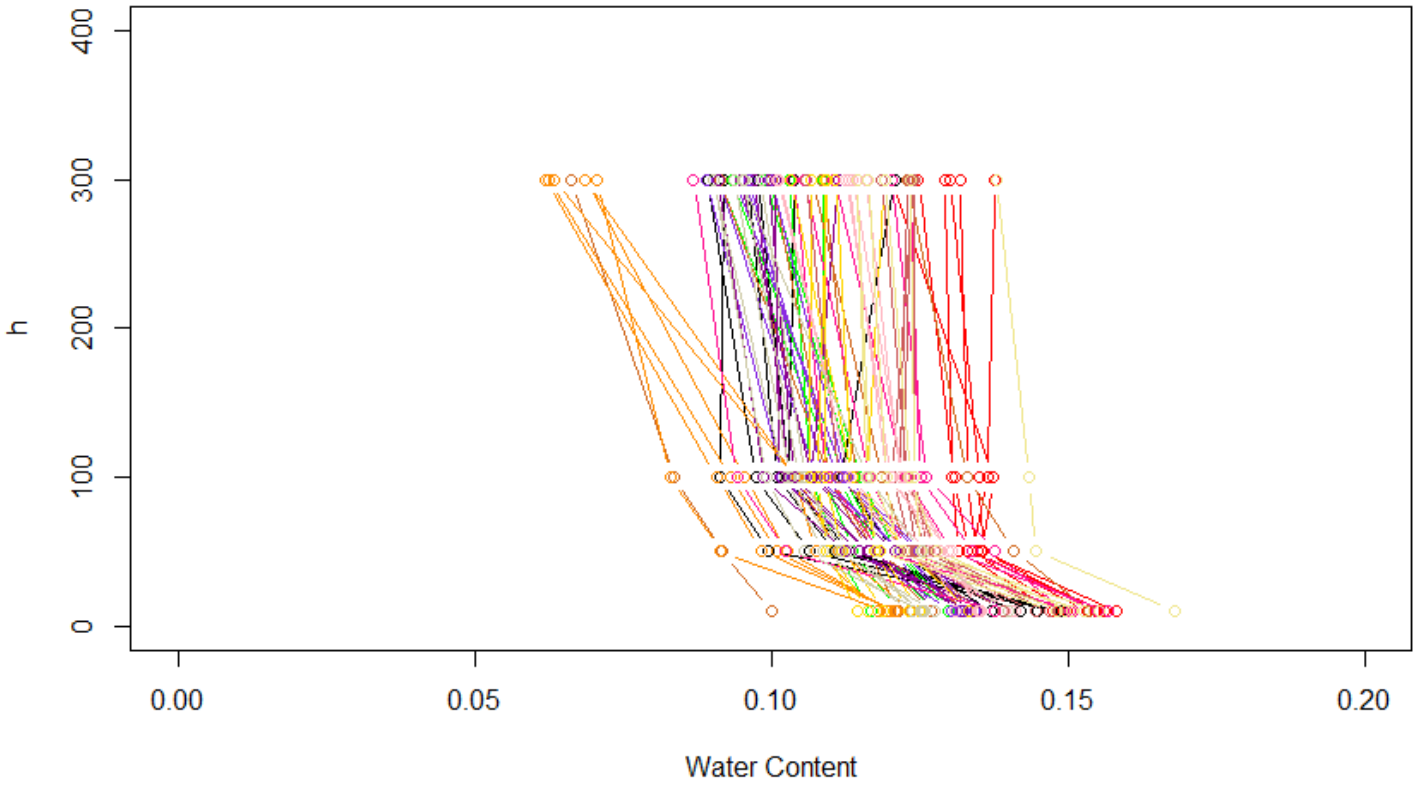




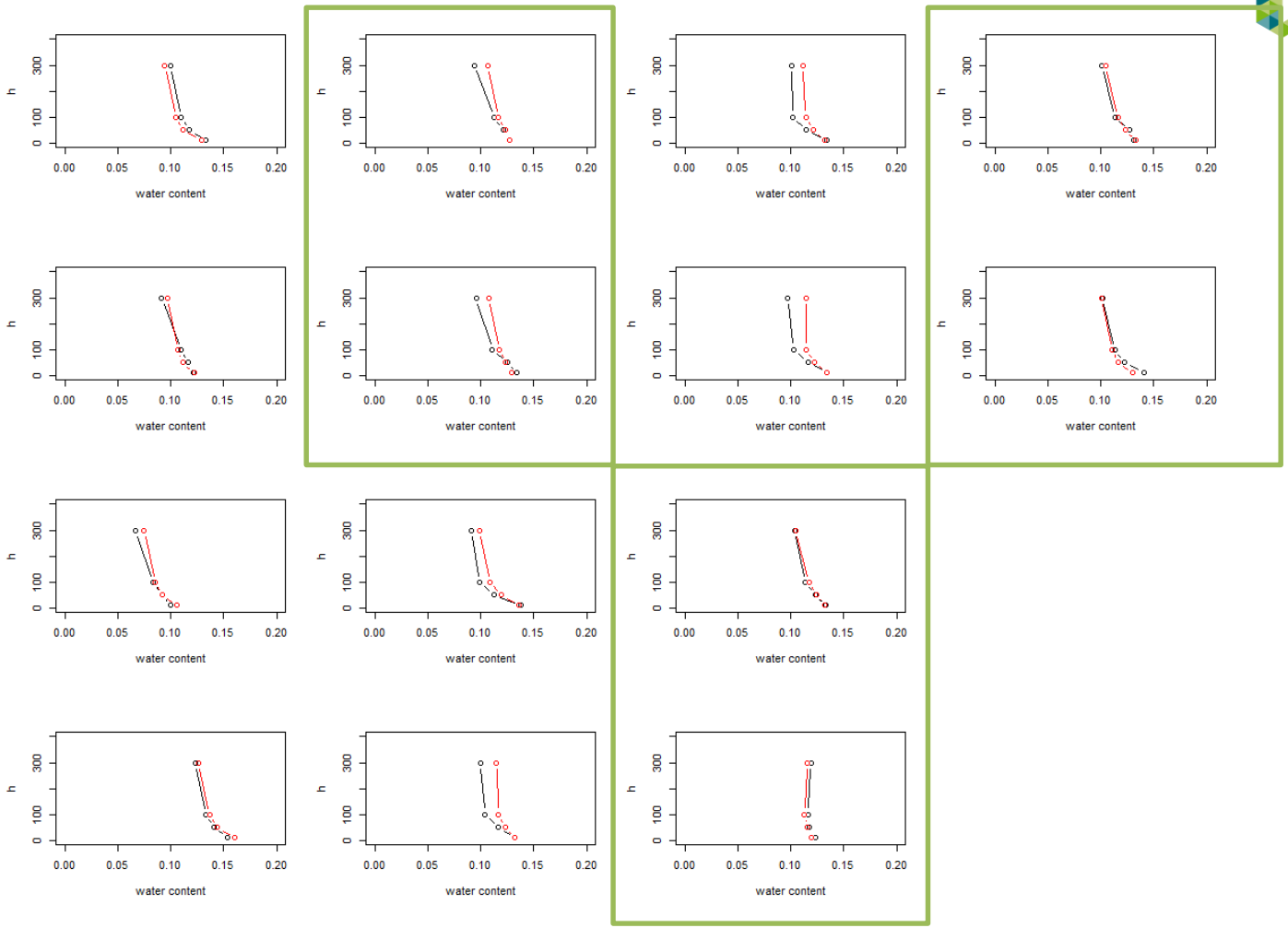
What we learned so far

- Are same samples giving the same data in different labs?

One color – one lab

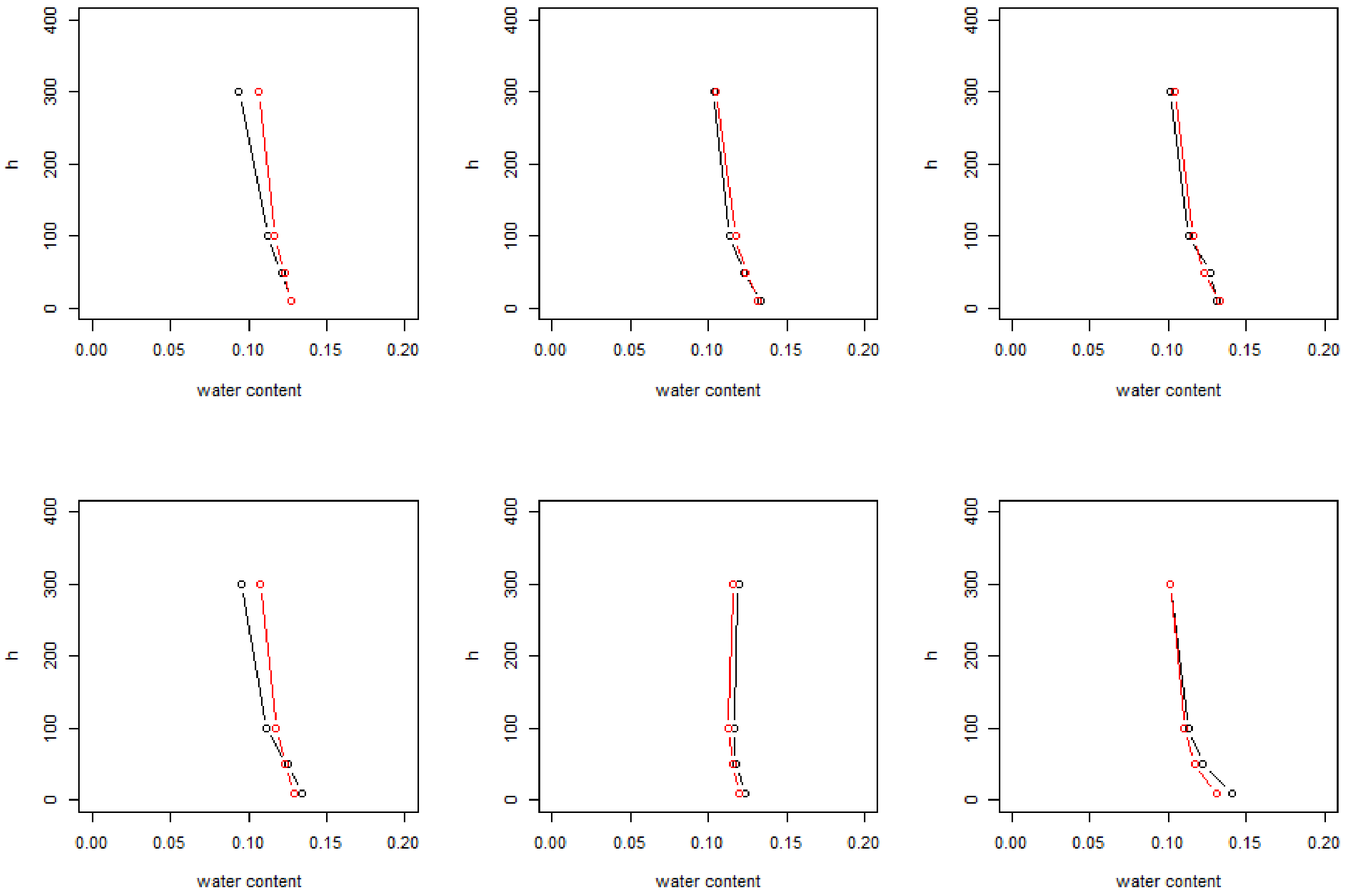


Comparison between Round1 and Round2



What we learned so far

- Are the measurements on a same sample stable in a given lab?



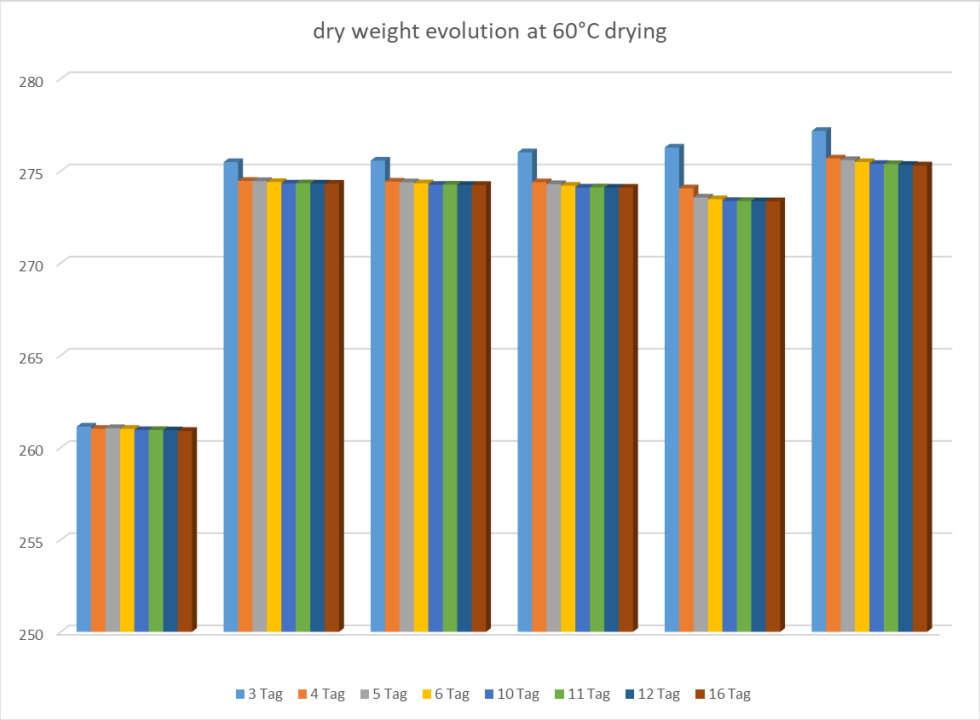
What we learned so far

- Are the samples affected by transfers between labs?
  - Need the 3rd round to answer

Foreseen schedule

- 1 lab in 1st round
- 10 labs in 2nd round
- 3 labs in 3rd round
- Next analysis for EGU2020
- A paper for 2021?

About samples drying



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