CTU rainfall simulators – new development and findings

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Main question

- What is the optimal device?
- Is the effort worth of the benefits?
- What have we learned?
- Shouldn´t we step back to origins?

It´s a quite critical review

Simple RS

- Commonly used worldwide
- Small plot
- Low water consumption
- Cheap
- Light construction

- Just water pump, hose and nozzle…

Simple RS (our colleagues)

- Is it a good approach?
- Identify the best setup for our research

By our device:

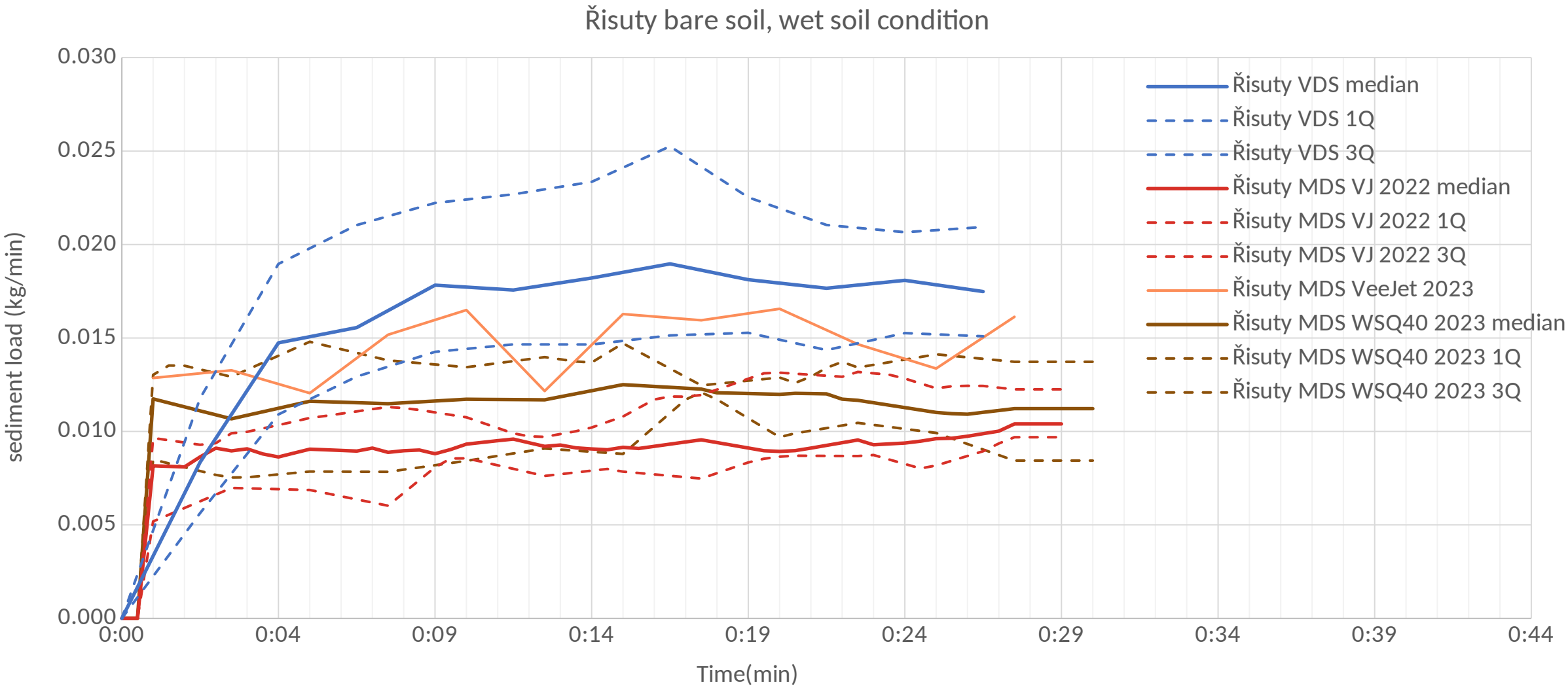
- They are amazed
- Isn´t it too complicated?

CTU Small RS

- Which nozzle is the best?
- Maintanance
- Updated version on the way (better one)

- Components (water pump for 3k CZK or 35k CZK, what is the difference)

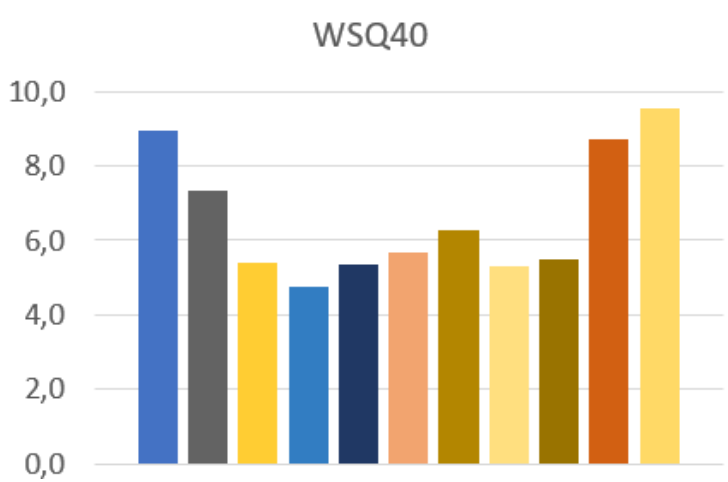
CTU Small RS

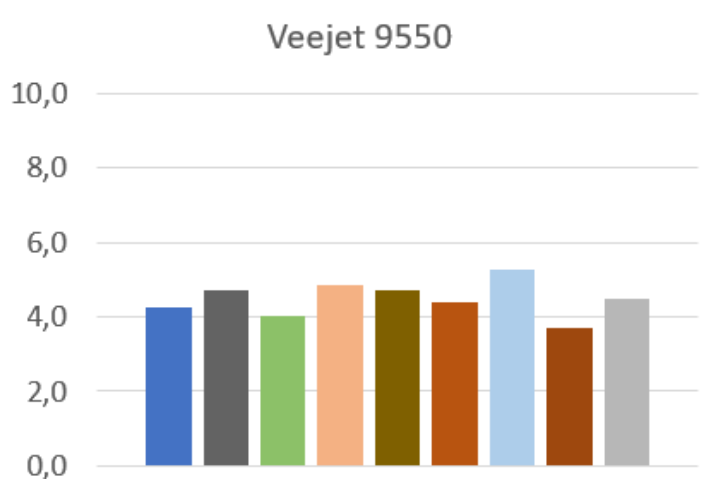

Řisuty bare soil, wet soil condition
sediment load (kg/min)
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0:00
0:04
0:09
0:14
0:19
0:24
0:29
0:34
0:39
0:44
Time(min)
Řisuty VDS median
Řisuty VDS 1Q
Řisuty VDS 3Q
Řisuty MDS VJ 2022 median
Řisuty MDS VJ 2022 1Q
Řisuty MDS VJ 2022 3Q
Řisuty MDS VeeJet 2023
Řisuty MDS WSQ40 2023 median
Řisuty MDS WSQ40 2023 1Q
Řisuty MDS WSQ40 2023 3Q

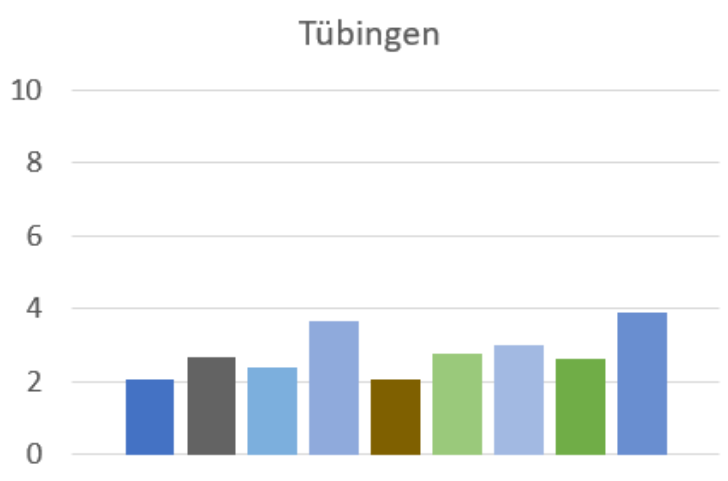
KE measurement (J/m2/mm)

CTU Small RS

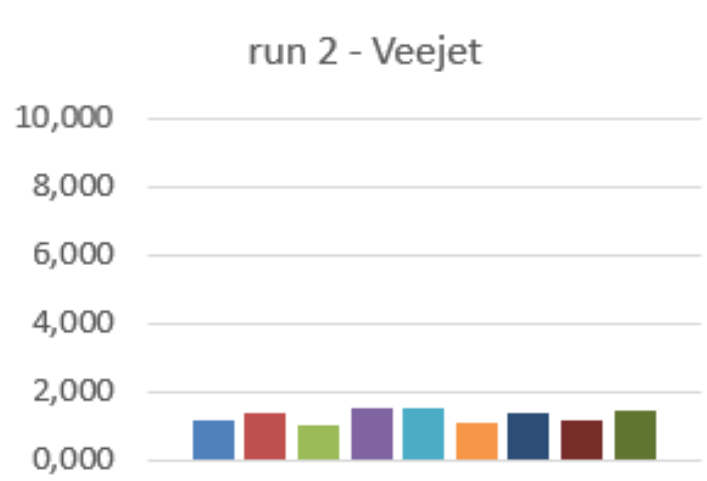
Disdrometer Thies

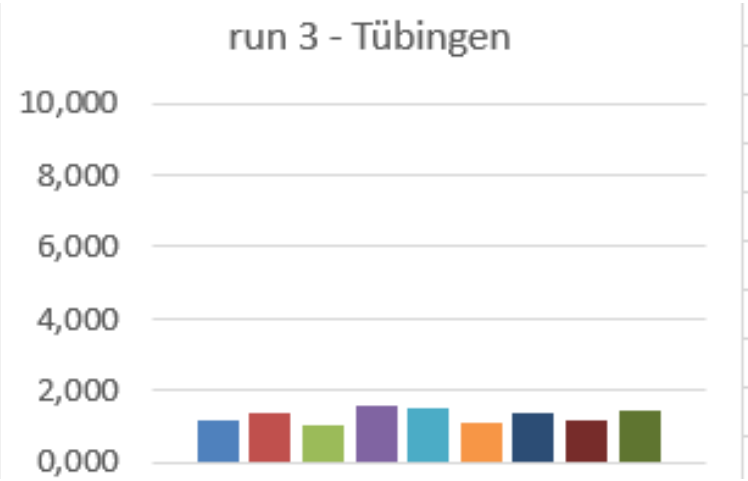






Sand splashcups





CTU new Large RS

- Raingauges to test the spatial distribution (any better idea?)
- Nozzles interuption – solenoids or seletrons? (expensive choice)
- More components, more problems
  (4 sections = 4x more problems =))
- Challenge to design, develop and manufacture (assumption vs reality)
- Written characteristic of devices vs reality

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Conclusion

- With more experience we struggle more.
- Desire for ultimate device
- Multi-purpose device is expensive, need maintanace and it is complicated
- Have more devices? Some really primitive and some advanced?
- The need to choose a methodology for measuring parameters