

A quantitative approach of the slake test for assessing soil structural stability

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Slides available here <https://frdvnw.gitlab.io/egu2020/>

Introduction

Farming practices have impacts on ecosystems ...



Fig. Land slides Credit ©RTBF, source : www.rtbef.be/info/regions/liege/detail_les-agriculteurs-souvent-pointes-du-doigt-apres-les-coulees-de-boue?id=9929773

... & global changes have impact on farming practices



Fig. Potatoes & drought (2018) Credit ©Le Sillon Belge, source : www.sillonbelge.be/2898/article/2018-08-09/rendement-et-qualite-des-pommes-de-terre-la-secheresse-et-la-canicule-pesent

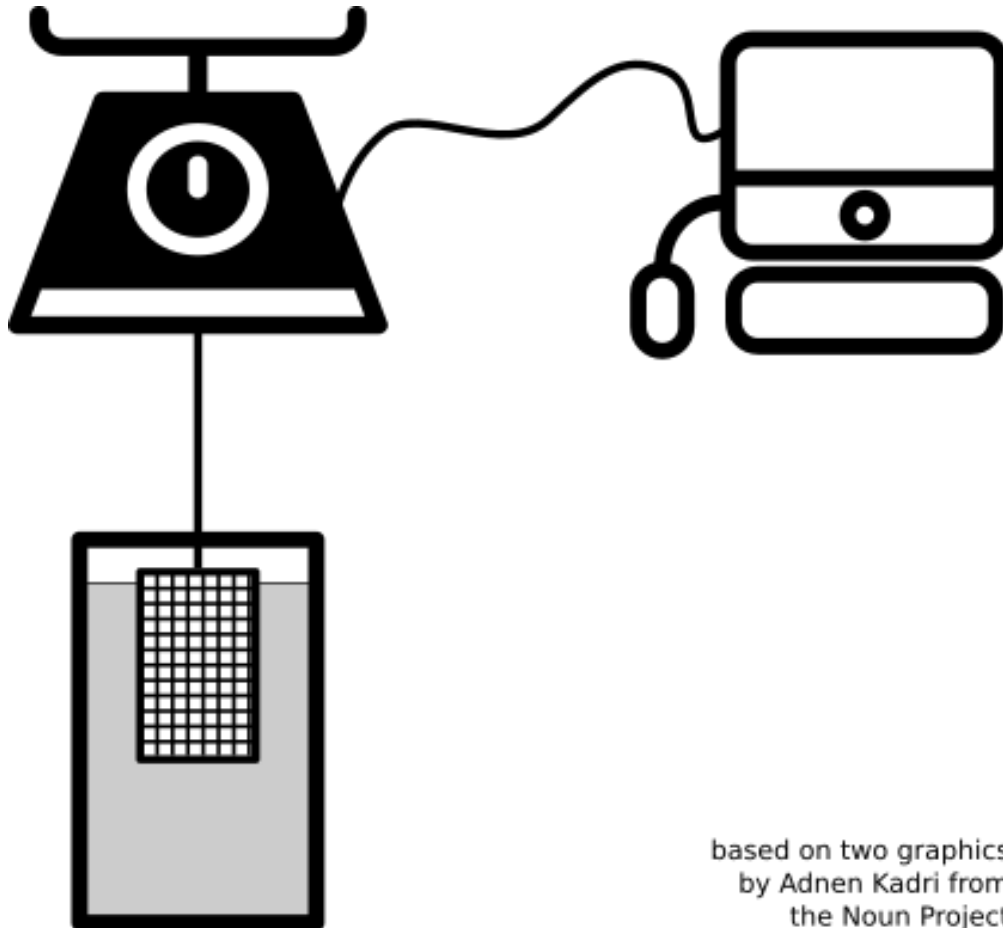
Indicators are needed, pragmatic, visual and simple for

- assessing soil fertility, quality, health
- assessing the impact of farming practices and ecological factors on soil parameters

Slake Test

SlakeTest

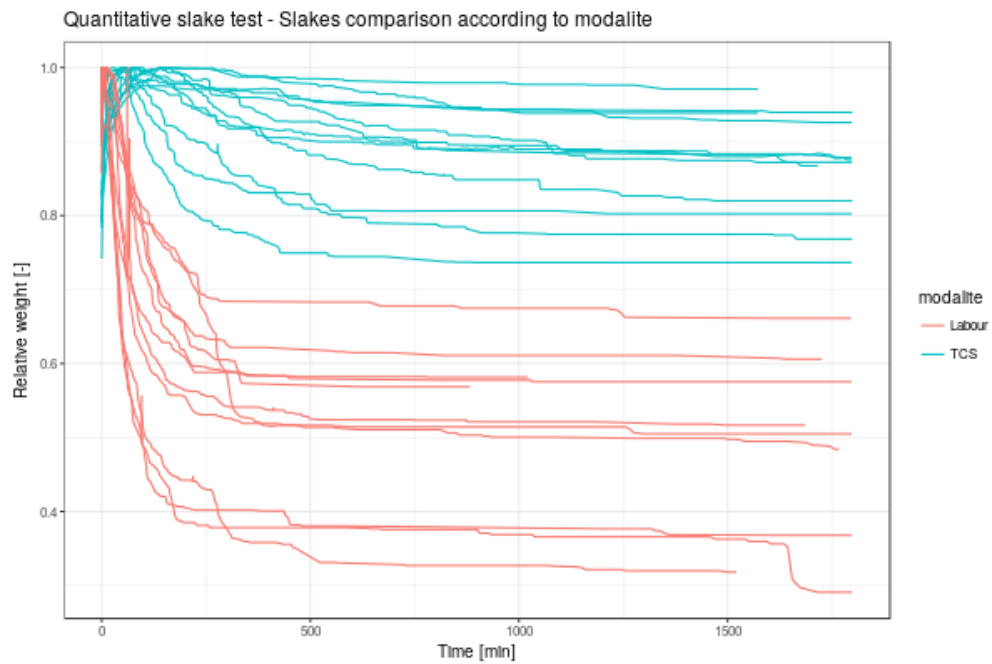
QuantiSlakeTest : a new approach for assessing structural stability of soils



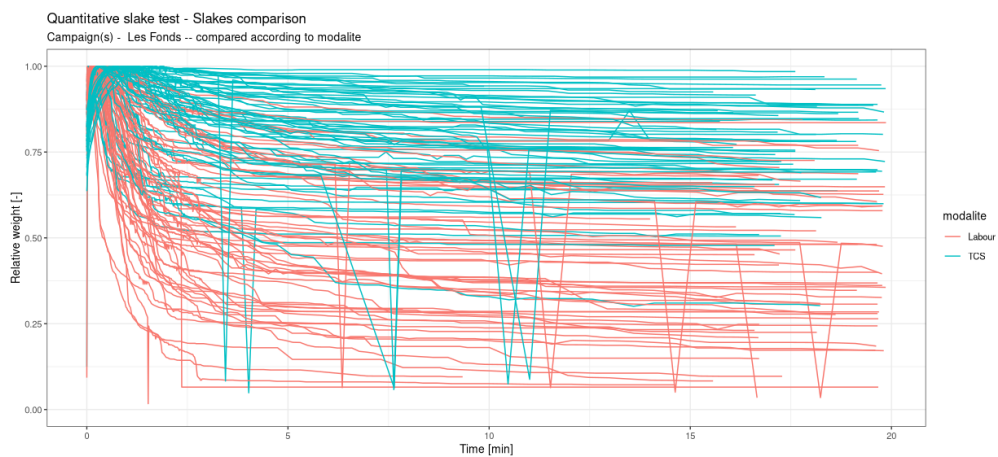
QuantiSlakeTest : a new approach for assessing structural stability of soils

<http://www.youtube.com/embed/G9UweThvHYI>

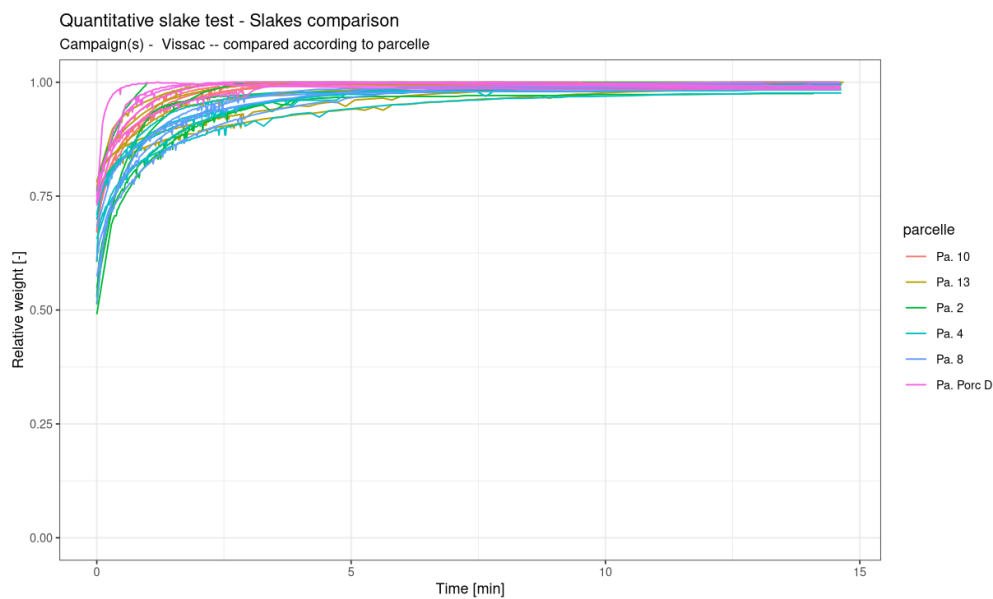
First results from 2017 promising for comparing contrasted soil management practices



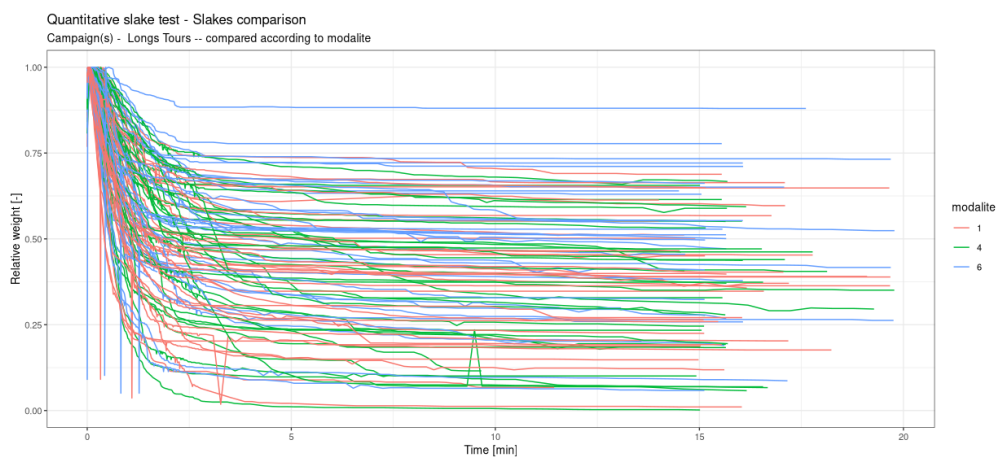
Confirmed by new field campaigns in 2018 et 2019 (tillage / non tillage)



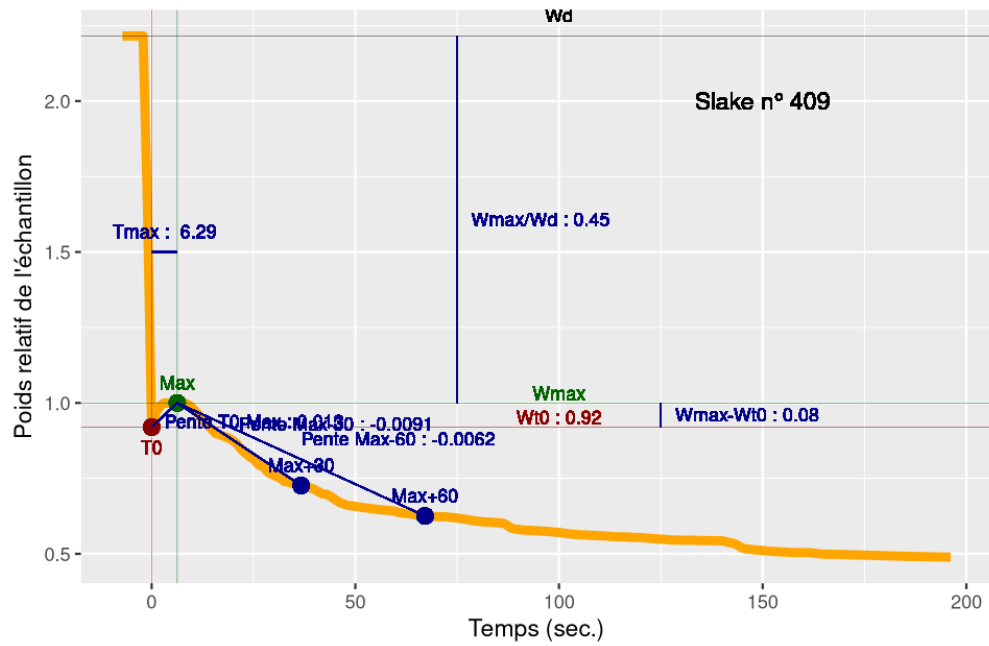
and comparison to new agroecosystems : grassland



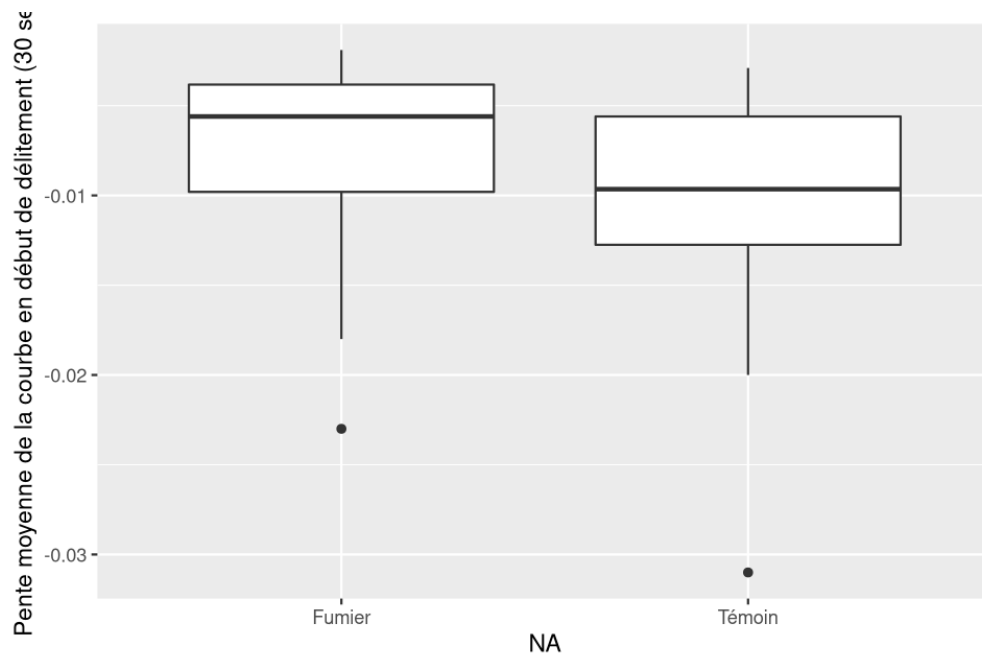
and comparison of other practices (organic matters)



Identification of curves indicators



Indicators for comparing practices



In practice, the approach is opensource :

Everything is developed through R functions in an draft R-package including a shiny app :

- for encoding the samples, campaigns, ...
- for launching a slake test by capturing data from a digital scale connected to the computer
- for visualizing the curves of carried out slake tests and controlling graphical parameters (time scale, colors by modalities,...)

sources : <https://frdvnw.gitlab.io/slaker/dev/>

Discussion and perspectives

Discussion and perspectives

- quantification of a visual test
- low tech
- close to natural conditions
- highly contrasted for comparing some practices (tillage/conservation agriculture)
- exploration of the physical meaning of the parameters of the curves and the influence of ecological variables (type of soil, humidity, ...)