Agroforestry: Can trees change aggregate stability?
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**Agroforestry: Can trees change aggregate stability?**

**Why?**
Soil erosion in farmlands is a major cause of water quality degradation and reduced crop production potential throughout the European countries.

Soil aggregate stability can be positively correlated to soil organic matter content, roots presence and soil biota (Graf and Frei 2013, Pérez et al. 2013).

In agroforests, if the role of tree lines as physical barriers to runoffs is easily understood, processes involving rooting systems and soil erodibility are still unknown.

**Objectives**
- Do the presence of a tree line improve soil aggregate stability?
- What are the mechanisms underlying?

**Are there effects of the tree line on soil aggregate stability?**
![Graph showing the effect of tree line on soil aggregate stability](image)

Higher soil aggregate stability in 5 sites => increment from critical to good levels of stability.

No difference between soil aggregate stability in tree-line and crops field in 3 sites (ED, LB & PS).

**What factors drive the soil aggregate stability?**

- Root proportion

The root proportion in the soil is positively linked with the aggregate stability.

The strength of the relationship differ between sites.

**Then... what next?**

- Most of sites are too young to reveal a distance effect to the line. => new sampling design with hedges.
- Next analysis to better explain our results: Soil organic matter content / Root morphological traits / Microbial activity & metabolic diversity.

**How?**
For each sample we measured:
- soil aggregate stability (Le Bissonnais 1996)
- microbial metabolic activity and diversity (microresp)
- root biomass and root traits diversity
- characteristics of the vegetation structure and soil properties.

4 zones were sampled in each 8 sites.
By zone, three samples in the tree line, at different distances from the tree, and two composite samples in the crop, at ½ and 3 of the distance between two tree lines.

**References**