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Agroforestry : back to the roots

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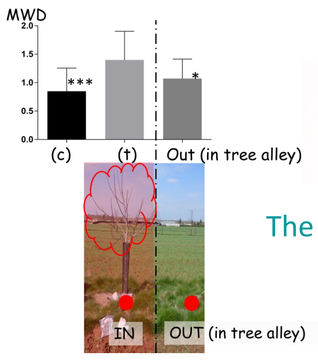
AGROFORESTRY: BACK TO THE ROOTS

Impact of root profile on soil microbial functioning: what are the consequences for belowground ecosystem services?

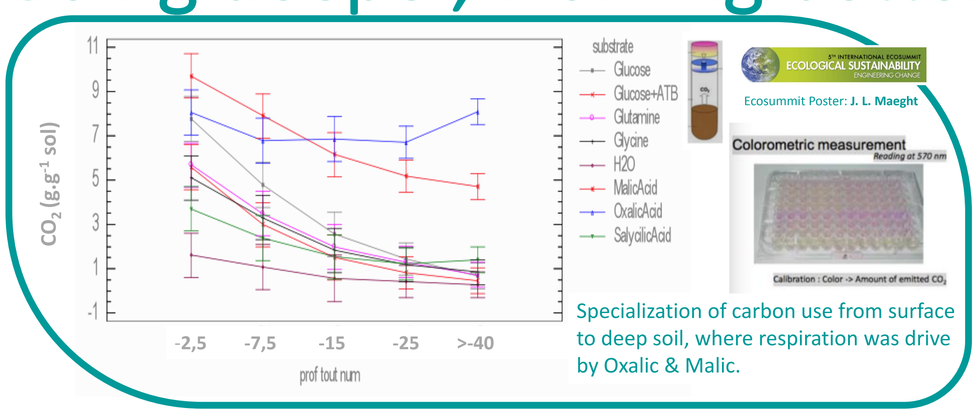
A More tree roots, more stable aggregates



The presence of ligneous roots increases stability of soil aggregates, even in presence of permanent herbaceous cover

=> towards **a specific role of tree roots ?**

B Going deeper, working better



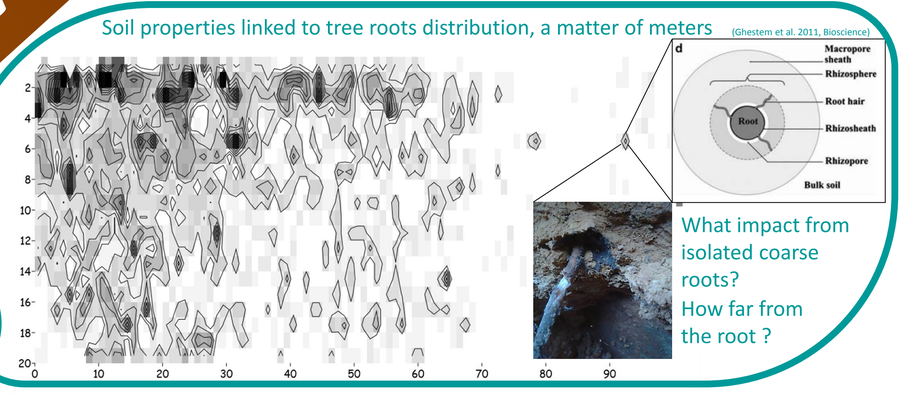
Ecosummit Poster: J. L. Maeght

Specialization of carbon use from surface to deep soil, where respiration was drive by Oxalic & Malic.

From microbial dynamic to soil erosion, tree roots play an important role all along the spatio-temporal gradient, from centimeters to territory, from days to decades.

C How much distribution matters ?

Soil properties linked to tree roots distribution, a matter of meters (Ghestem et al. 2011, Bioscience)

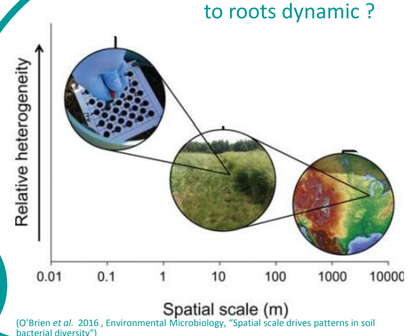


What impact from isolated coarse roots?

How far from the root ?

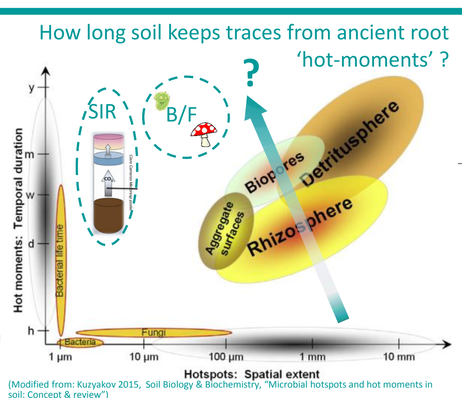
D The ‘root history’ impacts microbial process

A spatial heterogeneity linked to roots dynamic ?

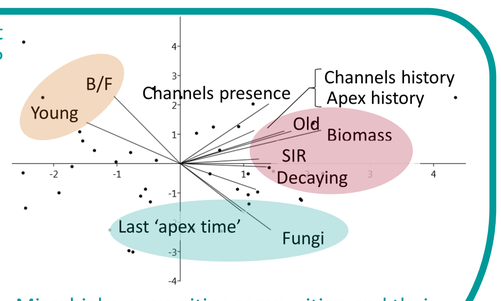


(O'Brien *et al.* 2016 , Environmental Microbiology, "Spatial scale drives patterns in soil bacterial diversity")

How long soil keeps traces from ancient root ‘hot-moments’ ?



(Modified from: Kuzyakov 2015, Soil Biology & Biochemistry, "Microbial hotspots and hot moments in soil: Concept & review")



Microbial communities composition and their activity are influenced until two years after a root event

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And for going further :

“L’homme qui plantait des arbres”

“The man who planted trees”

J. Giono

And a lot of thank s to all these guys who have spent some time helping me digging science deeper…

AMAP

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