Towards a zero net CO2 balance into an agroforestry cropping system - The SCA0PEST example

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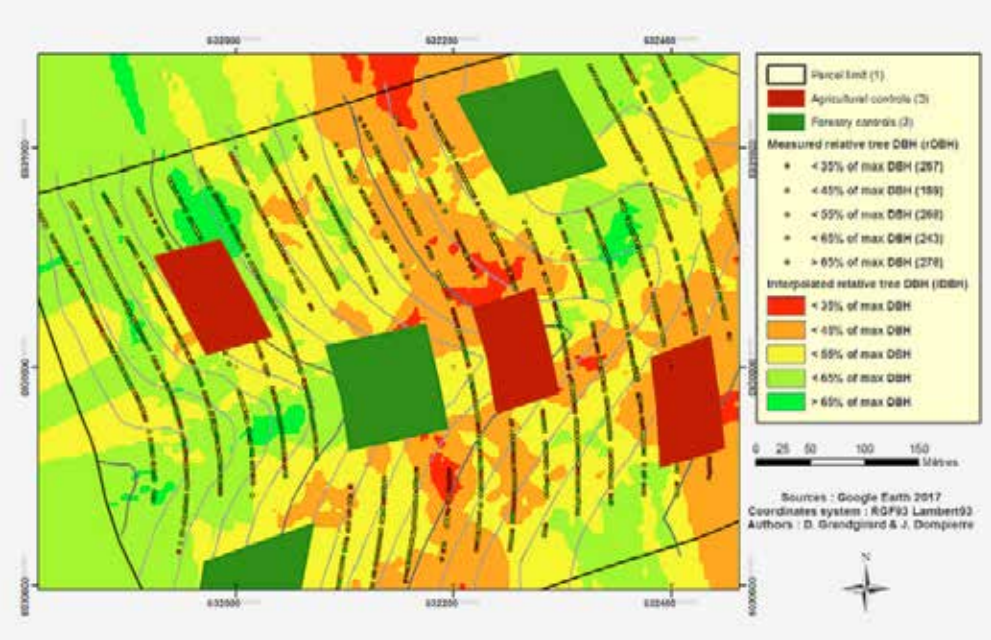
In low-forested agricultural areas where industrial crops dominate with the objective to maximize yield of every single hectare, setting up of Agroforestry systems (AFS) is often limited to less favoured soils. However, shift to a bioeconomy strategy in these territories expects new revenues from differentiating labels such as better net carbon balance of its agricultural raw materials. In order to produce useful references and ease the adoption of AFS, the SCA0PEST zero pesticide agroforestry project was initiated (Grandgirard et al., 2014) in order to test the feasibility of producing regional crops without pesticides, having recourse to integrated pests management (IPM) and soil conservation technics. Yearly, crops productivity, GHG balance and economic margins are determinated. Regarding trees, specific allometric models were elaborated; they are used to cross-validate simulated tree growth rate and CO_2 sequestration obtained from HisAFe model. Dendrometric measures (Figure) called within allometric models show that the actual trees growth follows the HisAfe simulation of a 650kg eq.CO_2/year/ha sequestration. When coupled to the 54% GHG emission reduction from the cropping system mutation, SCA0PEST actually presents an almost 100% reduction of its whole CO_2 emission meaning that C footprint and its valuation could become one of the expected evidence for farmers hesitating to adopt AFS.



Interpolated and observed (2018) DBH as a metrics of the tree growth rate across the SCA0PEST parcel

Keywords: Net CO2 balance, allometric models, Integrated pest management, Soil conservation technics, Product differentiation.

References:

1. Grandgirard et al. In Palma et al. 2nd EURAF Conference Book of Abstracts (2014) EURAF eds. 290p