



HAL
open science

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

David Grandgirard, Elisa Marraccini, Jim Dompierre, O. Boulanger, Fabien Liagre, Christian Dupraz, Delphine Meziere, A. Marin

► To cite this version:

David Grandgirard, Elisa Marraccini, Jim Dompierre, O. Boulanger, Fabien Liagre, et al.. Towards a zero net CO₂ balance into an agroforestry cropping system - The SCA0PEST example. 4. World Congress on Agroforestry, May 2019, Montpellier, France. , 933 p., 2019, Book of abstracts. 4th World Congress on Agroforestry. hal-02738002

HAL Id: hal-02738002

<https://hal.inrae.fr/hal-02738002v1>

Submitted on 2 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

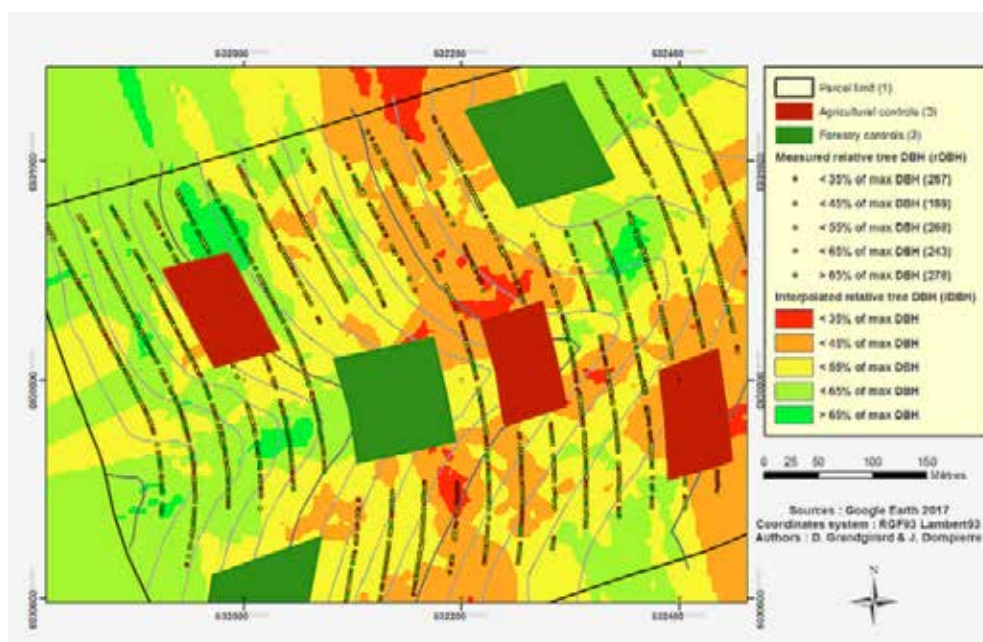
L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

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

Grandgirard D.¹ (david.grandgirard@unilasalle.fr), Marraccini E.¹, Dompierre J.¹, Boulanger O.¹, Liagre F.², Dupraz C.³, Mézière D.³, Marin A.²

¹UniLaSalle Polytechnic Institute, Beauvais, France; ²SCOP AGROOF, Anduze, France; ³UMR système, INRA, Montpellier, France

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 determined. Regarding trees, specific allometric models were elaborated; they are used to cross-validate simulated tree growth rate and CO₂ 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.CO₂/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 CO₂ 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