

# TOWARDS A ZERO NET CO<sub>2</sub> BALANCE INTO AN AGROFORESTRY CROPPING SYSTEM - THE SCAOPEST EXAMPLE

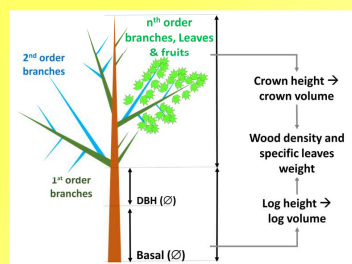
Grandgirard D.<sup>1</sup>, Marraccini E.<sup>1</sup>, Dompierre J.<sup>1</sup>, Boulanger O.<sup>1</sup>,  
Liagre F.<sup>2</sup>, Dupraz C.<sup>3</sup>, Mézière D.<sup>3</sup>, Marin A.<sup>2</sup>

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



ADOPTION OF AGROFORESTRY IS OFTEN PERCEIVED AS A "COST" MORE THAN A "BENEFIT" SO THAT IT IS GENERALLY SET UP ONTO LIMITED AND LESS PRODUCTIVE SOILS SUCH AS BOULDER CLAY SOILS IN NORTHERN FRANCE. BUT EVEN IN THESE SOILS AGROFORESTRY COULD BECOME A NEW SOURCE OF REVENUE: HEREIN, WE SHARE HOW WE REDESIGNED AN INTENSIVE "WINTER OILSEEDRAPE - WINTER WHEAT – WINTER BARLEY" CROPPING SYSTEM UP TO AN AGROFORESTRY AND PESTICIDES-FREE CROPPING SYSTEM AND ITS ALMOST NULL C FOOTPRINT

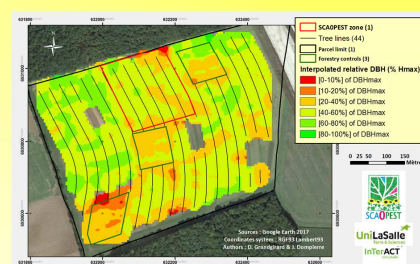
## TREE COMPARTIMENTATION TOWARDS ALLOMETRIC MODELS



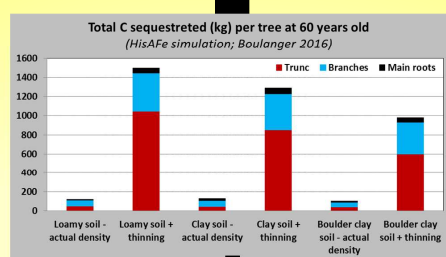
ALONG TREE LIFE, INDIVIDUAL TREES (N=25 PER TREE SPECIES) ARE SAMPLED, ALLOMETRIC MEASURES PERFORMED THEN LOCAL SPECIFIC ALLOMETRIC MODELS ARE BUILT



## LONGITUDINAL DENDROMETRY MEASURES TOWARDS POTENTIAL PRODUCTIVITY MAPS



YEARLY, DENDROMETRIC MEASURES ARE PERFORMED OVER EVERY TREE OF THE AGROFORESTRY SYSTEM AND LOCAL SPECIFIC GROWTH POTENTIAL IS INTERPOLATED



ALLOMETRIC ESTIMATION AND DENDROMETRIC MEASURES CONFIRM THE FIRST 10 YEARS OF THE Hi-sAFE TREE GROWTH SIMULATION

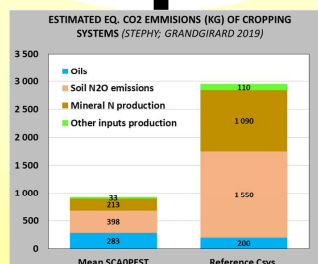
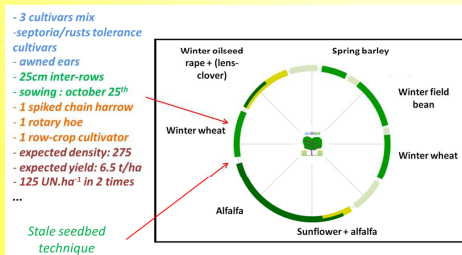
MEAN CO<sub>2</sub> SEQUESTRATION ≈ 575 KG EQ.CO<sub>2</sub>/HA/Y

WHEN COMPARED TO THE 2950 KG EQ.CO<sub>2</sub>/HA/Y REFERENCE CROPPING SYSTEM, THE SCAOPEST AGROFORESTRY SYSTEM ALLOWS FOR REDUCING BY 86% THE C FOOTPRINT OF THE RAW MATERIAL PRODUCED

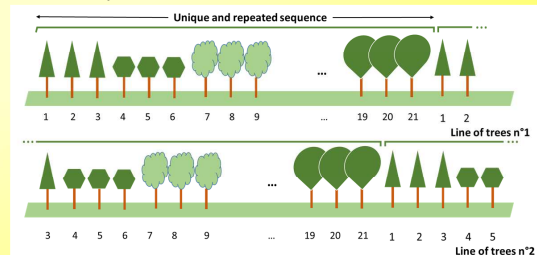
FINAL CO<sub>2</sub> EMISSION ≈ 980 KG EQ.CO<sub>2</sub>/HA/Y

ESTIMATED GHG EMISSIONS OF SCAOPEST ARE DIVIDED BY MORE THAN 3 THANKS TO IPM/IWM AND AF FACILITATION

AGROECOLOGICAL REDESIGN OF REFERENCE CROPPING SYSTEM: DIRECT SOWING, COVER CROPS, PHYSICAL, CULTURAL OR AGAIN BIOLOGICAL CONTROLS



SOIL, WATER BUT ALSO CROPS PROTECTION IS EXPECTED FROM 20 LINES OF TREES (10 TREE SPECIES) AND 3 FORESTRY CONTROLS IMPLANTED IN 2009 IN THE PARCEL



REFERENCE SYSTEM REDESIGN MOBILIZING INTEGRATED MANAGEMENT TECHNIQS + AGRICULTURAL CONTROL

BEYOND PESTICIDES, A SEMI-NATURAL AF MATRIX TO FACILITATE ECOLOGICAL PEST MANAGEMENT