

As requested by SNOWMAN, SUSTAIN project explored linkages with ECOSOM project. Therefore, University of Wageningen (Mirjam Pulleman) and University of Rennes 1 organized a joint meeting in February 2013, during 2 days in The Netherlands (at the Kasteel Hoekelum). The objectives of this meeting were (i) to present and discuss the results obtained during the first year, where focus was on the two topics that are common in the two projects (reduced tillage and organic matter management), (ii) to discuss the future dissemination actions (technical guide, stakeholders meeting) and identify joint activities, (iii) to present the future actions and common interests regarding the social and economic approaches, including characterization of ecosystem services, (iv) to present the proposed LCA activities to be done in 2014.

The presentations (pdf) are produced in annexe 1

The meeting was organized as follow:

Tuesday 26/02/2013:

12 talks were given in order

- i) to present results from ECOSOM and SUSTAIN projects for two specific themes i.e. reduced tillage and organic matter management,
- ii) to discuss result on methodological approaches for measurement of infiltration and aggregate stability (comparison of NL and FR methods).
- iii) to discuss dissemination activities that have been done so far, and will be realized in the future. Opportunities for joint dissemination between ECOSOM and SUSTAIN were identified.

The main conclusions were

- **Concerning the results from reduced tillage and organic management:** Some conflicting results were obtained for soil biological data. A new field campaign will be done in 2013 for some sites and some aspects (Those will include at least one French SUSTAIN site, and perhaps some other sites). A list of potential drivers which can act on biological and physical properties will be made; and new statistical analysis will be proposed

- **Concerning the methodological approaches:** for conductivity measurements, it clearly appeared that Decagon and double ring do not measure the same soil properties. These two methods cannot be compared but have to be considered as complementary. For aggregate stability, results obtained from SUSTAIN and ECOSOM will be combined and a paper will be produced focusing on the similarities and discrepancies of the two methods.

- **Concerning the dissemination actions, different decisions were taken or points were discussed:**

- ✓ **Meetings:** meetings will be organized, that are addressed to different stakeholder groups
 - to farmers at national level (based on existing network, e.g. CRAB, PPO) and will deal separately on reduced tillage and OM management;
 - to other stakeholders (policy makers, advisors ...), with several options :
 - 1 by country
 - 1 common in one country:
 - 1 day but separate topics : ½ day OM + ½ day RT; theory and field trip (however, this field trip seems to be very difficult to organize)
 - 1 day with mix of topics: Ecosystem services = common umbrella
 - 2 different meetings with separated topics (OM and RT)
- ⇒ Simon proposed a phone meeting with SNOWMAN dissemination board to take part to the discussion

- ✓ **Brochure:** It was decided that the brochure will not be a technical guide, and that the topics i.e. reduced tillage and organic matter management will be separated.
 - for Reduced Tillage
 - it will be included in a Handbook (NL)
 - the technical brochure which was produced few years ago by CRAB, will be updated by SUSTAIN results and other knowledge (F)
 - for OM
 - the technical brochure will be similar to French technical brochure on Reduced tillage.

- ✓ **Webcommunication.** The communication via internet tool will be different depending on programmes
 - 1 webpage on INRA for ECOSOM
 - 1 webpage on University of Rennes for SUSTAIN
 - 1 website for SUSTAIN

There will be a strong relation with ECNC for SUSTAIN project (and ECOSOM should take benefit from ECNC)

There will be also a strong relation with SNOWMAN website

- ✓ **Dissemination to Scientists.** The dissemination to scientist will be done via i) the participation at congress (e.g. RAMIRAN at Versailles, World congress of soils sciences at Korea, International Symposium on Earthworm Ecology at USA), ii) peer-reviewed papers

- ✓ **Dissemination to large public.** The dissemination to large public will be done through the participation at different social events, training to farmers and technical papers to farmers.

Wednesday 27/02/2013:

- 8 talks were given in order
 - i) to present the sociological and economical approaches which will be developed in 2013.
 - ii) to discuss approaches for characterization of ecosystem services such as carbon sequestration, soil structure, water flux, yield production.
 - iii) to discuss about the Life Cycle Analysis which will be developed in 2014.

The main conclusions were

- **Concerning the social and economical approach:** the work will be done in France (Kerguéhennec); Djilali will send the questionnaire to benefits from comments. If a student is available the investigation could also be done in NL (SUSTAIN).

- **Concerning the Ecosystem services:** two types of Ecosystem services were identified, classified as "soft" Ecosystem services which are easily measured (e.g. food production) and "hard" Ecosystem services which are not directly measured (e.g. carbon sequestration, GHG).

For the "soft" ES, the relation between soil properties and ES will be done in France (SUSTAIN - Kerguéhennec), it is still necessary to think about the parameters which have to be included in the analysis.

For the "hard" ES, it will be done in France for carbon sequestration (ECOSOM-Qualigrado); it is still under reflexion for GHG (SUSTAIN-Lelystad); all ideas are well come on the schema proposed by INRA France.

Detailed notes SUSTAIN Planning meeting Feb 2013 including action points

Present: Stefan Schrader, Martin Potthoff, Alexi, Vincent, Jurgis, Mickael, Djilali, Olivier, Safya, Guenola, Mirjam

- Field campaign: Kerguennec March 2013. There will be several students involved.
 - o Safya: why in March => very early? Djilali: before spring ploughing and OM application
 - o Safya normally measures aggregation every 3 yrs (sometimes also different seasons within that year), but not every year. The results of 2012 were consistent with earlier results. Moreover 2013 was very wet: the differences between treatments will be less.
- Dissemination,
 - o What type of activities?
 - o Guenola: OPVT (via website), 500 farmers since 2011. Hands-on training on soil assessment. Wijnand: In NL Louis Bolk Institute will set up something similar.
 - o What is the success factor for OPVT in France? Guenola: part of the farmers are from a reduced tillage network, they are motivated. The other part is being paid, not intrinsically motivated -> less good quality of results.
 - o Olivier: there is a lot of demand for training, because of attention for ecologically intensive farming.
- Data collection, database:
 - o Wijnand: Work on P dynamics has also started at the Lelystad trial. There is also soil C stocks and N₂O emissions
 - o Martin: you have tons of data but at different levels. Think about how to integrate them into scientific analysis
 - o Wijnand: At PPO a big data base is built for all the data from the different experimental sites in the Netherlands. This includes different types of management practices. An integrated analysis of soil and crop parameters is going to be made.
 - o Guenola: we should try to have one student next year who can integrate the data for SUSTAIN sites (management, soil properties, ecosystem functions)
 - o Steve will be doing this by MVA in the Lelystad trials.
 - o Safya: If we want to do that we need to start thinking NOW about the type of indicators/data that we need to include.
 - o Database: avoid duplication with existing databases, e.g. PPO. How can we extract easily from that? (Wijnand: PPO database is still work in progress)
 - o Wijnand: Newcastle University has a database structure for Tilman. Easy to manage. We could use the functional design as an example for ours. Data are delivered to the database manager in excel according to guidelines. => Action WIJNAND: share functional structure of Tilman database.
 - o Mirjam: Who is going to manage the SUSTAIN database? => Guenola: Laurence is involved but there is no money for this activity.
- Data collection (field campaigns – spring 2013 at Kerguennec and Lelystad).
- LCA and Mask (Djilali socio-economic approach) have been postponed to 2014
- Technical guide: Content to be developed in 2013 , final product in 2014
- Integration of all data will be done in 2014
- Website: April 2013. Format/structure is developed and will soon be sent around by Guenola for comments.

Notes SUSTAIN/ECOSOM meeting

Tuesday 26/2 10.30. For participants list see excel file

- Results Kerguennec presented by Guenola: Results contradict previous yrs.
 - o New hypothesis: crop (rotation) more important than tillage. What about previous samplings? Always in maize or also wheat? How do the results relate to other years in total 7 species abundances? Is there any indication of (adverse) weather effects?
 - o Martin Potthoff: Endogeics, dominated by *A. Caliginosa* => even if they can feed at the surface they do not feed on the organic matter at the surface, but on the microbes directly.
- Results Steve. Wijnand: we now have new experiments with organic matter and tillage management separated.
- Jaap: drought increases aggregate stability and reduces treatment effects.
 - o Mirjam: Does data set include organic farms? Could that give an indication of different response (e.g. due to organic matter availability)?

- General discussion
 - o Steve: there are common patterns in data from Kerguennec and Lelystad
 - o Guenola: can we make a list of factors that can interact with the tillage or override the tillage effect and may be responsible for the very variable response?, **such as crop, organic vs conventional, organic matter additions, weather conditions, resilience of earthworm community?**
 - o **Can we test this list in a multivariate analysis across all the sites and years? => to be explored in small group**
 - o **Ron: Look also into the dynamics based on earthworm species biology**
 - o Lijbert: qualitative analyses of conditions that can overrule earthworm signal, may not mean that over the long term the earthworm effect is not important.

Tuesday 13:30

Site presentations

- Guenola presents results different organic amendments in combination with tillage. Few sign. effects, high standard errors for many data. Variation within plots not so high but between blocks.
 - o Ron: use block as a covariable in your analysis

Method comparison

- Guenola: Not really a method comparison but more about: how can we integrate the results obtained with different methods?
- Presentation Vincent Decagon vs Double Ring. Measure different things, but also implemented at different depths. Ksat corresponds to biggest pores, Lowest suction corresponds to smallest pores
 - o Which method corresponds with earthworm activity?
 - o What about the variability found with the two different methods?
- Presentation Mirjam about aggregates.
 - o Stefan: what about carbonate applications at the sites? This has effect on aggregate stability
 - o Can aggregate stability be related to microbial biomass, etc? => we know from literature already a lot about mechanisms but what is the relation with ecosystem services?
 - o At grignon sites the conditions at sampling were not optimal, very wet. We have the experience that it reduces aggregate stability and masks differences between treatments

Dissemination

- There are different audiences. They need to be addressed in different ways. Outputs will therefore be at 2 levels: Brochure is more general for policy and farm advisors, technical handbooks for farmers (to be done as part of ongoing activities in individual countries. The brochure will link to the technical publications.
- *Audience: farmers*
 - o Wijnand: do not focus on many individual farmers but farm advisors.
 - o Veronika: there is also compulsory training for agri-environmental schemes in CAP, link up with that? E.g. Estonia example on functional agrobiodiversity
 - o Farmers are more easily addressed at national scale in own language.
 - o Wijnand: Messages to farmers are not related to a project but to what farmers need/want to know. It should be placed in the context of their farming, combining different sources of information.
 - o PPO is already planning to make a technical guide on reduced tillage, not only for combinable crops but also fine seeded/tuber crops. Digital (updatable) and/or paper version?
- *Audience: policy, private sector, farm advisors, top 5 farmers*
 - o Mid term stakeholder meeting: Is this a common SUSTAIN/ECOSOM meeting?? => Do SUSTAIN and ECOSOM address the same stakeholders? Probably not but partly. We could have a meeting on one day with alternating schedules (half day field half day meeting room; participants can choose to attend one or two meetings).
 - o Agathe, on the brochure: "Sustainable improvement of soil quality" ca 10 pages with common introduction and one part on tillage and one on organic waste amendments (Guenola: technical guide is not the right description).
 - o Planning: written in 2013, published in 2014. To be distributed at final workshop.
 - o Simon: Snowman can support a webinar to share information of national meetings with people in other countries
 - o RAMIRAN Conference on waste management. Versailles June 3-5 2013 on waste management recycling of organic residues for agriculture 'from waste management to ecosystem services'.

- Veronika: 2013 is the Int Year of Water Cooperation. The European Seminar of ELN FAB (Fall 2013) will be organized in that context
- Ron: SKB also organizes an annual stakeholder meeting every year in NL, where we can be present.
- Final Snowman meeting
 - Simon: Snowman takes the initiative for this meeting. SUSTAIN + ECOSOM and possibly SAS-STRAT

Wednesday 27/2 10.30

Socio-economic approach

- Djilali: In Brittany only 10% of the total number of reduced tillage farmers does continuous reduced till. All others plough once every few years
- Safya: what is the status of the vegetable farmers in small parts of Brittany? Djilali: Reduced options for pesticides is also a reason that reduced tillage is not used much there, for phytosanitary reasons.
- Olivier: increasing farm sizes is an important trend that may further increase the interest in reduced tillage- for labour saving reasons. Mirjam: This is also the case in NL
- Guenola: Are farmers who are disadopters included in the survey so that we can understand the reasons? Djilali: no they are not, but it does happen.
- Mirjam: **If a student is found for this topic then we can also use the questionnaire of Djilali in NL, based on the reduced till farmers innovation network.**
- **Djilali: Will send questionnaire around for comments**

Ecosystem services

- Sabine/Marie: scheme (chain approach Peltre et al 2012), based on pedotransfer functions
- Roth C to estimate soil C change -> then physical soil characteristics follow.
- Physical functions: through determination of Plant Available Water (pF curve), Atterberg values (liquid/plastic limit) – link to workability.
- Carbo pro tool for end users (Veolia website).
- There are trade-offs that need to be identified.

LCA

- Roth C -> Soil Organic Matter. Mirjam/Safya: what about performance of RothC for reduced tillage? -> overestimation of N mineralization
- per individual crop in rotation => aggregate into entire system and express per ha.
- SUSTAIN contribution to LCA: develop LCA indicators that estimate impact of agricultural activity on soil biodiversity and soil quality.
- Wijnand/Mirjam: collaborate with Josephine Peigne (TILMAN, ISERA France)
- Guenola: Also with PP project (Eric Blanchart).
- **Mirjam: will there be a workshop on LCA? -> input on parameters for Mickael? => To be organized in Fall 2013 with smaller group and invited external experts as mentioned above.**

Important action points for SUSTAIN:

- WIJNAND: will share functional structure of Tilman database as example for SUSTAIN.
- GUENOLA: will share structure and format of website for suggestions
- GUENOLA: Initiate a list of factors that can interact with the tillage or override the tillage effect and may be responsible for the very variable response. Then we will test this list in a multivariate analysis across all the sites and years
- DJILALI: Will send questionnaire around for comments
- MIRJAM: Will try to recruit a student for studying socioeconomic aspects in NL based on the questionnaire of Djilali
- GUENOLA/MIRJAM: Organize workshop in Fall 2013 with smaller group and invited external experts to further develop LCA approach