GO-GRASS

Grass-based circular business models
for rural agri-food value chains

Meeting Minutes

[Replication and Business Environment Workshops Romania 26.09.23]

AUTHORS :

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°862674

1. Meeting Information

Date	Tuesday 26th September 2023
Starting Time	10am
Ending Time	17pm
Meeting type	Face-to-face meeting
Venue	Research Institute for Agriculture Economy and Rural Development (ICEADR)
Requested partners	Stakeholders in Romania; G2G, ATB, Dutch Demo representatives
Invitees	

Roundtable:

Commented [OR1]: Please check the names in case of misspelling or add further information

- *Stelliana Rodino* : Researcher ; research on agricultural development and rural development
- *Ion Toncea*: President of ARAD funded in 1998 ; Focus on organic farming;
- ***Aurel-Florentin Badiu*:** Vicepresident of Romanian Agriculture Academy;
- ***Vasile Mocanu* :** Scientific director of Grassland Research and Development Institute, Brasov;
- ***Monica Tod***: Breeding researcher of Grassland Research and Development Institute, Brasov;
- ***Florentin Milea:*** department of agriculture policy of Ministry of Agriculture and Rural Development;
- ***Dumitru Georgescu:*** department of agriculture policy of Ministry of Agriculture and Rural Development;
- *Tudor Stanciu:*: member of ARAD; farmer who grows organic farming, and agricultural engineering
- *Paul Adrian*: Engineer, focus on organic fertilizers
- *Ion Georgescu (ARAD)*: working with The Paper Mill in Comana; social enterprise and NGO - supporting community with crafts
- *Vily Dragomir, director of the* The Research Institute for Agriculture Economy and Rural Development (ICEADR)
- *Reka Szigeti* - SCHUT papier
- *Gosse & Rommie* – Dutch DEMO
- *Carmen* G2G
- *Dragonoveg*: researcher, marketing

2. Introduction by Carmen G2G

- 3 workshops which will be the building steps for replication plans

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Overview of tools

Tool 5:Guidelines for "Train-the-trainer" scheme (D8.5)
Tool 2: How to get started and succeed manual (D8.3)
Tool 4: Masterclass Modules
Tool 1:G2G business plan writer (D8.1)

→ Introduction of business plan writing tool (Tool1)

- Questions:
  - Once someone puts their information in the tool, how do you manage all that private information?
  - Would it be a problem/risk for entrepreneurs to use such kinds of tools?

- Response:
  - if you don't want to share the information you don't share it, if you need feedback you can decide what or how much to share
  - When applying for start-up funding one has to disclose the business plan information, otherwise no money
  - if you want to be convincing you have to share some information

- Question:
  - Is this tool only for agricultural businesses? Are there already some examples put in practice?
- Response:
  - The measures for funding differs within countries, there are measures for funding

The next part of the workshop will deal with Raw Material (Gosse Hiemstra,Hiemstra), Grass Fiber production (ACCRESS NL) and the final product Schut Papier NL)

3. Introduction by Gosse Hiemstra

- Background on chemical engineering and business administration
- Motivation: With all the funding the EU is putting in research and development how can we take this into the market?
- Initiative to develop GO-GRASS from the DUTCH side
  - We started making trays for eggs and tomatoes
  - RQ: how can we use the cellulose from grass in paper production with the objective that grass cellulose is substituting wood cellulose
    - the idea behind is that it is a lot of low value or low quality grass to prevent unnecessary cutting of trees
  - Hiemstra, ACRRES, SCHUT PAPIER, NOARDLIKE FRYKE WALDEN (involved in providing the grass)

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4. Brief overview of GO-GRASS DEMOS

- Danish DEMO
  - small scale grass refinery for extracting protein–non ruminants such as chicken and pigs
- Swedish DEMO
  - unused reed canary grass to produce local heat treated animal bedding
- German DEMO
  - Local production of biochar using late-harvest grass

5. Dutch DEMO

- Grass is harvested in the north of NL from NFW, then grass goes to ACCRESS (middle) where the production of grass cellulose technology is, then to Schut papier (south)
- Two types of grass paper (or papergrass)
  - adding dried small particles of grass to the paper pulp
    - Nice appeal and market value but do not contribute to the strength of the paper
- Relevant trends for the project
  - the price of wood fibers doubled since the start of the project
  - Covid-19 increased home shopping and need for more carton packages
  - paper products as substitute to plastic product
  - grass fibers requires less energy and chemicals over the whole chain
    - LCA show 10% less without transport distances included
    - wood requires high energy, high pressure
  - roadside grass has a status of being waste
  - nature value added crops is also often cut and led to rotten

What do we consider as low quality grass?

  - grass not fit for dairy cattle , which will not produce milk from it ; e.g. nature grass has a too low protein content to be fit for dairy cows
    - nature grass: grasslands in national parks
      - agricultural grasslands: nature meadows in agricultural use
      - nature grasslands rented and used by farmers but not for milk but for non lactating cows, for calves or for bedding
    - Road-side grass: current waste status
      - towards extended use ? policy is needed to remove the waste status from this grass
    - waste is when is the end status of the material
- **Nature grass availability**
  - in NL approx 590 kton dry matter not fit for agricultural use
  - at least 93 kton per year is available for grass fiber production
- **Roadside grass availability**
  - 2500 km of roadside of which approx 18k is herbaceous vegetation
  - approx 100 kton of dry matter, which is currently composted
  - roadside grass needs removal of pollution
    - new machine developed and available in the market to harvest grass, while taking care of insects
  - transport and logistics
    - mowing, bailing (in squares) , delivered to ACCRES

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- **Competitors and developments in NL**
  - several competing uses for low quality grass
  - composting
  - biogas production
  - use as feed
  - use as bedding material

Upcoming developments NL

  - Bokashi production (silage anaerobic conditions
  - insulation material, i.e. grass wool
  - pressing of roadside grass and use the juice in salt for anti slipperiness
  - local composting at farm sites
  - GOGRASS Demo, paper making and biochar

6. Question & Response Dutch DEMO

- Question: Would the harvesting machine in NL be suitable for Romania?
  - in Romania we have dryer weather so grass is dry by June
  - it is not possible to harvest all year
  - we harvest from April to June for feed
  - there are some poor inhabitants from village who use the road-side grass to feed their animals
  - for making grass-paper it is necessary to have high yield of biomass with high dry matter content for making paper
- Question:
  - Which grass species are better for making paper?
  - Paludiculture - we find a lot of species with high amount of biomass (e.g. fragmites australis)
  - Tradition in Romania for making paper using this kind of plant
- Response:
  - Paludiculture is from wet areas, we go for grass, but Schut paper can make paper from tomato stalks, all kind of biomass can be used –more herbaceous biomass

- Question:
  - in Romania it is forbidden to take away organic matter from the mountains, organic matter must remain there in the area (institutional development)
    - It could be for preventing erosion?
  - What about specific machinery to harvest in marginal areas?
- Response:
  - Different rules regarding national parks and reservation for whether or not you are allowed to harvest the grass or not. In Germany focus on protecting the birds, in Holland is too much nitrogen because they have too many cows so they are removing the grass so the grass is not used for feed.

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7. Presentation by Rommie (ACRRES-WUR)

- Grass fiber production: lab works and results, technology development and upscaling
- Yesterday **we patented the forthcoming technology that detects pollution in grass using AI**
- Question:
  - What is the reason why grass cellulose can be stronger than wood?
- Response:
  - It has to do with fibrillation , in which fibres are treated in such a way that they get hooked to each other
  - maybe see this: https://www.zelfo-technology.com/

- lab scale at the moment and scaling up production
  - 1) dry digestion, 2) washing, 3) alkali treatment, 4) milling, 5) gas storage
- Question:
  - Do you have experiments for optimal harvesting time or stage of biomass for paper making?
- Response:
  - it is important to have as much the same, we try to harvest in dry conditions, sandy biomass is very difficult to use as sand is very hard to wash away (they have tested it with biomass from Germany)
- Question:
  - What is the ph rate after digestion?
- Response:
  - around 8
- Question:
  - How is the relationship between the university and the industry?
- Response:
  - we have experiments for forage quality for animal nutrition
  - it is good idea to use marginal areas for biomass, to make a lot of products
- We take what is available, if it would become a big business we would be willing to sow something (farmers)

- Question:
  - what is the wet digestion and the dry digestion?
- Response:
  - they use some bacteria (same type of bacteria like in the cows stomach), or manure- if you use manure, all products coming out are manure and in Netherlands there are strict regulations about manure. They go to Germany to get the bacteria to feed the unit in ACRESS.
  - The process replicates what is happening in the stomach of the cow

- Question:
  - Do you need some sort of energy to kickstart the process for extracting the fibers.
- Response:
  - Romie: we heat the fluid and than we use the energy from biogas.

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- Question:
  - Have you tested what happens with paper over time? would it resist more than wood cellulose?
- Response:
  - not yet –depends on what you want, if its for packaging you want it to decompose fast, if you want for long duration you might beed to add something

- Question:
  - How are the collaborations with the research center and the industry? How close is the industry with the research center with regards to testing ?
- Response:
  - in Romania, reg. the topic of today, industry is not interested on this kind of grass, because they have wood and enough wood and they have technology, some with very new technologies and do not want to change
  - we want to promote this idea to other kind of entrepreneurs and investors because there are some environmental problems like tomato stems; for some seasons it is a problem because quantity of tomato stems are high and there are no solutions to re-use and solve this problem
  - wood will be more and more expensive–the climate change –it is because deforestation was the main activity for business man because it is a good raw material
  - Gosse: in NL is not so different because all companies use wood cellulose, other focus on niche products, but if the neighbour of you is a huge producer of sanitary paper, for them to start experimenting with grass cellulose the risk is so high, in one moment it will break, they will have to stop their big machines
- Question: what would be the main market for wood in the future?
  - building material, heat and fire (only low quality wood for heat)

8. Presentation by Reka- Schut Papier-NL

- Oldest and smallest paper production company in NL
  - it's a developing company for Claire Fountain
  - Part of the family of the biggest paper producing company in NL
- Our mission is to make high paper quality, flexible durable and sustainable
  - tonnage per year ca 4300 ton-half is art paper
  - know how of different fibers- cotton, cellulose, flax, sugar cane, bamboo, hemp, jute, grasses, straw and biobased coatings
  - we take requests from any kind of industry

Paper is made from cellulose

- Cotton has the highest cellulose content of all plants, making up to 90% of its dry weight
- Flax 75-80%
- Hemp 70-75%
- Jute 60-70%
- Bamboo 40-50%
- Wood 40-50%

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  - Grasses 30-40%
  - Wheat straw 30-40%
  - Corn 25-30%
  - Soybean 15-25%

There are some companies who use animal dung because are already digested

Future steps:

- commercialization: refining products, marketing, distribution and partnerships
- licensing/ technology transfer: exploring opportunities negotiating agreements and technology assessment
- dissemination sharing findings in conference, publications, and engaging with the scientific community
- market analysis : assessing demand, competition and barriers
- financing: self funding grants, collaborations and investments

- Packaging paper for flowers (made of the waste from the flowers), there are only ideas

9. Consumer perceptions and preferences:

- paper aesthetics visibility of grass fibres
  - 48% prefer visible fibers
- past experience with non wood based paper
  - 40% have never used non wood based paper
- non wood based paper purchases
- reasons for buying non-wood based paper
- necessary information before purchase
  - they will like to hear a story
- Factors influencing purchase decision:
  - quality ranked highest
  - environmental impact, characteristics and price were equally important
  - accessibility ranked lower
  - originality was the least important
- Future Research: explore price range preferences, and specific target audience needs and preferences

We get a request from a customer, we start to work on it to calculate what i cost to produce and 80% of the time its not going to happen because its to expensive for us to produce.

Question: what are the challenges of the business? except sustainability

- everything has to be bio-degradable recycled
- paper is energy heavy producing process
- its easier to get the cellulose from grass than from the wood
- the problem is avaialbilty of row material, we do not have enough for big scale production companies

Question: Cotton is the 1st in cellulose content , why not going for this for producing paper?

- its easier to cut the trees and transport than grass
- even hemp is good for there are regulatory hurdles
- the industry is built on wood cellulose so you would need to change everything

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10. Presentation by Ion Toncea and Monica TOD : Biomass of grass for paper- availability, diversity and quality

diversity of grass species for paper

- miscanthus giganteus (50% cellulose)
- phalaris arundinacea (protein, ash, fiber, lignin, solubility in acid or neutral detergent) →
- medicago sativa stems
- solanum lycopersicum stems

- diversity of paper grass in RO is presented by Phalaris arundinacea and miscanthus
- 2 species of culture alfalfa for seeds and tomatoes whose stalks are waste after harvesting ; there is enough grass
- Questions:
  - What would be the results of an innovation project? to produce fibers
  - Who is doing to use it to make it a marketable product?
    - Income from the Dutch demo comes from Shut papier(end customer of fibers)

Discussion is applying for EU funding for building the plant for fiber production. Acres would be a partner helping them build it and operating it.

- We can see there is a lot of potential in Romania, but there is a need for a technology and research institute to do the testing and further development.

- If we bring Dutch technology in Romania, you need some partner to support and technical assistance.
- In Romania we need to think about the harvesting, transport and storage of Raw material.
- Best mechanism for commercialization is to engage the end user in it, like we engaged Shut papier as our end user for fibers.

- operational group can applied for financing this type of projects

11. Presentation by Ion Georgescu

First small scale tests made with paper with Mischantus cellulose, created a series of notebooks with the cover from Miscanthus and recycled paper. For the welcome package of the conference we have produced notebooks with paper and insertions of Miscanthus.

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Second series of tests made with cellulose from Canary Grass – the welcome letter from the conference folder is printed on 25% Canary Grass cellulose and 75% recycled office paper.

Gosse`s final words: more convinced about opportunities in Romania

12. Business Environmental Workshop- Richard ATB

Survey results for the Romanian case

- 1.st place funding is the area in which the Romanian follower needs more support in , but what does it exactly mean?
- 2nd Technology and knowledge is the second area where support is needed.
- 3rd Consumer agency needs also support, in terms of we need end customers for the end products

13. New project ideas: how to actually replicate?

From ION Toncea

- proposal for next EU projects with colleagues from NL and RO
- NL should hurry up with the technology and make it accessible so partners from ARAD can buy it
- understanding key components of grass paper value chain—
- get in touch with potential customers
- create a canary grass to be used as forage for animals

From Ion Georgescu

- what we can do at small scale is to continue exploring processing grass products that can be integrated into products that can be sold and provide income

From Farmer Tudor Stanciu

- farming can still be attractive activity but more funding is needed

From Ministry (agricultural policy department)

- things are not so complicated, there is enough money, what is important is how to use it and who are the beneficiaries?
- if there are few, impact on society will not be so big
- introduce reed canary grass in crops which can be subsidized

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