



GO-GRASS

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

Dutch demo:
Low quality grass ->
high quality paper & packaging



Partners in The Netherlands

Leader:

- Gosse Hiemstra
- **Participants:**
- Acrres
- Schut papier
- NWF (Noardlike Fryske Wâlden)



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Dutch Demo

Introduction

Creating high value from low quality grass by retrieving the grass fibers from it and utilise them for paper and carton/packaging production.

Processes:

Grass: harvesting – storage – delivery.

Fibers: (grass cleaning) – digesting – fibers.
biogas and liquid fraction.

Paper: testing - manufacturing



Valorise: paper with fibers from tomato plants



Grass fibers for paper production



Location in Netherlands





Low quality grass

Nature/fauna grass:

Grasslands in national parks

Nature meadows in agricultural use

-100.000 ha, 15.000 ha non-feed, 90 Kton/yr dry grass

Nature parks (part of Natura 2000)

Road-side grass:

Waste material today, ca. 500 – 600 Kton/yr

National, provincial and private roads





Project Grass -> Paper

Grassfiber for paper/packaging

- High value products from low-quality grass (roadside- and natura/fauna grass)
- Paper industry: more circularity and use of renewable sources and energy
- New parameters of the digesting proces
- Technology paper/packaging proces upgrade
- New cleaning machine of roadside grass
- Higher income for the land owners in the rural regions





Project Grass -> Paper

Challenge: Grass using for paper production

- Problem: high sugar and protein content disrupts the paper process.
- challenge: how to remove sugars and proteins from the grass and keep the grass fibers. Especially the cellulose.
- Tried several solutions: no success
- Now: investigate the digestion process





Project Grass -> Paper

Solution

- Theory:
 - Sugars and proteins are quickly broken down during fermentation.
 - The grass fibers remain.
- Question 1:
 - Which type of digester: Stirred wet digesting or dry-digesting
- Question 2:
 - how long should the grass remain in the digester: 2 – 6 - 24 hours or 2 months

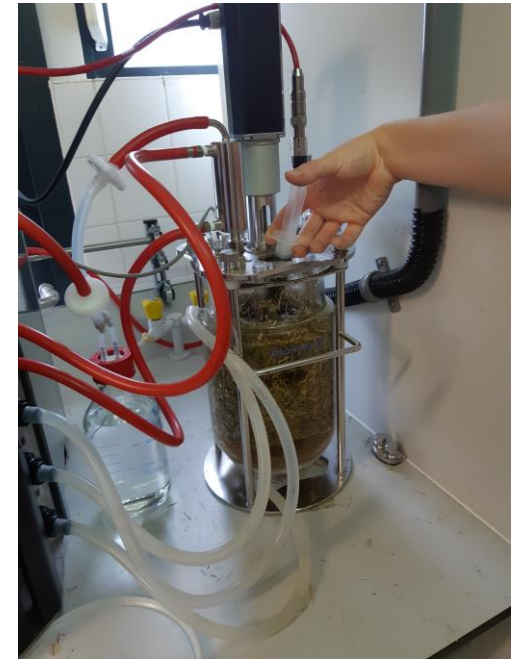




Project Grass -> Paper

Tests: small stirred wet-digester

- Test done with small test digester: Biostream (3 l content)
- 2, 6, 24 hours and 2 months.
- The grass fibers are now being examined and will soon be sent to Schut paper for a pre-test.
- the test was done with a stirred wet-digester.





Project Grass -> Paper

Tests: dry - digester

- We are also going to investigate whether dry digester gives better results.
- We are therefore building a prototype of 60 l capacity.
- In tests starts in November





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