

CINDERELLA

Update VIII

22nd of July 2016, W. Wichtmann

“Comparative analysis, integration and exemplary implementation of climate smart land use practices on organic soils: progressing paludicultures after centuries of peatland destruction and neglect”

By irregular updates the CINDERELLA community and colleagues are informed about dates, news and other interesting issues within the scope of the CINDERELLA project, ref. paludiculture.

All partners are kindly asked to provide current information which can be inserted here. The idea is to keep all project partners informed on the same level, to exchange information, to ask project related current questions, to prepare meetings and to make appointments as well as to prepare common activities (publications, new projects, etc.).

Conferences and workshops

SWS Potsdam

The 11th annual European Chapter meeting of the Society of Wetlands Scientists (SWS) was held in Potsdam near Berlin, Germany, 17th -20th of May 2016. See more information on the homepage: <http://www.sws.org/europe-chapter> and on our project dropbox.

Montpellier

The 5th International EcoSummit Congress 29th of August – 1st of September 2016 is the next chance for several project partners to meet. There will be a double session on peatland restoration and paludiculture (Monday, 29th) as well as round table on paludiculture (Wednesday, 31st). For more information: <http://www.ecosummit2016.org/>.

Gdansk

The IWA Specialist Conference on Wetland Systems for Water Pollution Control will take place the 4th – 9th of September in Gdańsk, Poland: <http://icws2016.org/>

Greifswald - Preparation of the 2nd reed conference (2017)

Some of you will remember our rrr conference which was rather successfully held in Greifswald, February 2013 (<http://www.paludiculture.uni-greifswald.de/en/projekte/rrr2013/index.php>).

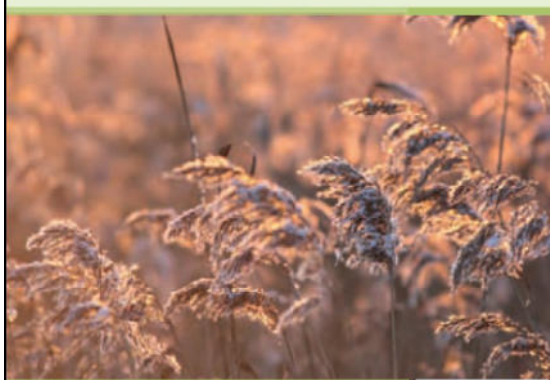
Although the budget for this had been cancelled within the CINDERELLA project by the German funding agency, we are planning to organize the follow up conference in late summer 2017. The first announcement to this second international conference (www.rrr2017.com) on reed as a renewable resource in Greifswald now is on the way (see the flyer below). Please save the date! More information will be provided after the summer break.



2nd
International conference
on the utilisation of
wetland plants

RRR2017 Renewable resources from wet and rewetted peatlands

September 26th - 28th 2017
Greifswald, Germany



Save the date!



The utilisation of biomass from wet and rewetted peatlands offers promising new potential as renewable raw material, fodder and fuel. It may combine the substitution of fossil resources, sustainable land use, nature conservation and the maintenance of ecosystem services.

The international conference RRR2017 will again bring together actors from research, governance and practice in order to build networks, detect research demands and exchange experience and information.

Topics:

- Biodiversity
- Biomass to product
- Case studies & country reports
- Economy & life cycle assessment
- Greenhouse gas emissions
- Legal framework: incentives & constraints
- Nutrient removal & water retention
- Species: productivity, genetics, physiology

Visit www.rrr2017.com for further details.



Paludiculture activities in Indonesia:

As reported before, up to 2 Million hectares of degraded peatlands will be reclaimed for paludiculture in near future. For more information:

<http://www.fao.org/indonesia/news/detail-events/en/c/414437/>

<http://jakartaglobe.beritasatu.com/news/govt-issue-peatlands-restoration-guidelines/>

<http://archive.wetlands.org/OurWork/ClimateMitigation/Paludiculture/PaludicultureinIndonesia/tabid/3469/Default.aspx>

News from the project

CINDERELLA Project meeting Denmark 23rd to 26th of May 2016

Thanks a lot to Brian, Franziska, Carla and Hans for preparation and organizing the project meeting at Rönbjerg, Denmark. This meeting was a milestone in forthcoming of project issues, looking forward on next steps to be done. Please find the protocol on this meeting, including short reports on excursions to Vejlerne Nature Reserve and Lille Vildmose and the summarized plan for upcoming activities in the workpackages in the dropbox.

Activities in Nijmegen (Christian Fritz, Jeroen Geurts, 20-Jul-16)

Cinderella activities and Paludiculture is in full swing this summer in the Dutch team. We enjoyed the inspiring meeting with the project partners in Denmark. Brian, Carla and Hans thank you for organizing the meeting and hosting us. A photo report on recent activities you find in the project dropbox.

Activities:

1. Replanting of the field experiment in Zegveld that was 'accidentally' drained by the farmer in 2015 decreasing the water level down to ~65 cm. This year the water level is rather constant some 20 cm above the soil surface. We planted *Phragmites australis* (Dutch?) and *Typha latifolia* in 6th of April and 11th of May, respectively. Each in 8 plots of 12 m² (ca. 100 m² per crop species). This week 4 plots of *Typha angustifolia* will be planted, *Salix alba* and *Miscanthus*.
2. A new projected 'Veen, Voer en Verder' has started together with 2 Dutch partners. Focus of the project is to investigate ways to use PaludiCrops on dairy farms (roughage, fodder and bedding material). We measure the fodder value of *Phragmites*, *Typha*, *Salix*, *Miscanthus* and *Zizania*, test silage from summer harvest of *Typha* and measure the water absorption capacity of winter harvest material. In the second step we go for capacity building of local land users and farmers – mainly plant the idea that wet soils can still be of value and being used productively.
3. Beginning of June we harvested our mesocosm experiment with peat soils from 2 different locations (rich soil vs. poor soil). *Typha* and *Phragmites* were exposed to N-loads from 0 up to 450 kg ha⁻¹ to make a comparison to Carla's experiment possible. Phosphorus, potassium and other elements were supplied by the 2 different soils. We wanted to test if N-addition can reduce the mobilisation of phosphorus and if young plants could suffer substantially from high N-loads.
4. Field days nearby Greifswald together with Claudia, Christian Schröder and many others. We evaluated the effects of harvesting date (September vs. February) and flooding post-harvesting on the biomass production of *Typha* in the subsequent season. For that purpose Jeroen and Claudia installed new plots for summer harvest (Early July). The field days were enriched by a workshop organized by Tobias, Anke and many more where we could learn about *Typha* as building material. Companies working with *Phragmites* building material were also included.



5. During the field days in Greifswald we have found large stretches (20-50 m wide and several hundred meters long) of spontaneous colonization of Typha. This reminded on the nice experimental plots Lille Vildmossen. The more we can learn from this type of colonization and its timing (soil moisture, water level, temperature, light competition) the better.

Earlier activities (9-May-16)

Several Paludiculture pilots are in the process of being setup in co-operation with the Dutch Cinderella team. We are working on a plan for 4 sites:

1. Bargerveen – 17 ha water buffer zone owned by State Forestry. First plots with Reed, Cattail, Willow and Alder will be planted in June 2016.
2. Bûtenfijld - 1 ha owned by a local farmer will be planted with Cattail for construction material. Reed comes already up spontaneously.
3. Nieuwkoopse Plassen – 0.5 ha will be planted with Cattail for feeding young cattail (part of a national research funding) summer 2016
4. Zaandam – 3 ha Paludiculture research facility will be constructed by Landschap Noord-Holland. The goal is to test PaludiCrops at different water levels and inflow of nutrient rich and alkaline surface water. A range of crops will be tested (Azolla, Typha, Iris, Reed + Sphagnum).

There are more potential sites and requests but these 4 are the most developed ones for the time being. We are glad that Wetlands International (Arina Schrier and Marcel Silvius) are also actively searching for potential pilot sites and Dutch/EU funding to establish a culture of PaludiCrops.

Raising awareness

We are promoting paludiculture for water retention and carbon sequestration to water authorities and regional governments (provinces). In the past 12 months Jeroen, Christian, Bas (Landschap Noord-Holland) and Leon have given presentations and lectures at different occasions. We organized a Paludiculture Plant exhibition at the university's New Greenhouse complex where also the State Secretary for Education and Research attended. We presented at the Peat Meadow Water Day. Hans Joosten presented at the Dutch Conference on land subsidence (Heel Holland Zakt) in Den Haag while Jeroen and Christian showed products made of PaludiCrops to stakeholder groups. In September the Dutch Cinderella team will co-organize a Knowledge-Transfer day for 'Wet Agriculture' and Paludiculture together with Stowa (national water authorities) and Vic. As soon if there is a final date we'll let you know.

Field work

Much effort has been spent on setting up and rearranging pilot sites. We think that we have also found reliable equipment to measure and regulate the water level in sites that need high water levels. The soil and plant samples collected in Germany, the Netherlands and Denmark are pretty much analysed. Results have been shared and will be further discussed during the up-coming meeting. Additional sampling is planned for German sites beginning of July. For the Swedish sites potential areas have been located.

The contact with HanzeWetlands is working well however we haven't analysed biomass collected by the harvesting machines of HanzeWetlands yet neither has their time efficiency tested within WP 6. Main challenge is that the machines can't plan several weeks ahead and travel throughout the Netherlands and Belgium harvesting often on clay soils and wet organic sands dominated by *Juncus*. No *Typha* sites are harvested by HanzeWetlands unless we organize this with permits and subsidies.

Activities in Greifswald

Guests from Netherlands in Pomeranian peatlands
CINDERELLA partners (Greifswald, Nijmegen) organised an excursion for Dutch participants on paludiculture and peatland restoration aspects in Pomerania. Participants came from regional authorities, water associations and scientific institutions. They were mainly interested in paludiculture and climate aspects of peatland utilization. Several restored and peatlands managed by different means and intensities have been visited. More you can find in the protocol on the project partners dropbox.

Request for data

Felix Reichelt, who already joined the Denmark project meeting, will start his work in Cinderella WP 7.2 (ecosystem services) by beginning of August. He has already begun collecting measurement data concerning nitrogen retention in wetlands of all Cinderella studies. As he mentioned during our meeting in Rönbjerg before, he is dependent on data input from partners. Please send your results. He is also interested in measurements of former studies (e.g. in constructed wetlands). If you know about other measurement data, (grey) literature, or if you know results from comparable studies, he would be glad to hear from you (karl.felix.reichelt@posteo.de).

Especially needed are the following parameters:

- system import:
 - N, P and pH of water inflow
 - atmospheric N-input
 - N- and P- fertilisation (if implemented)
- system export:
 - yield (dry mass), C/N ratio, N- and P content of harvested biomass
 - N, P and pH of water outflow
- system parameters:
 - mean annual water table
 - C/N ratio, N- and P- content, pH of the soil
 - species composition of the vegetation (with coverage and height if possible)
 - denitrification rates (if measured?)

Field day in Kamp, Peene river estuary, 2.7.2016

Aldert van Weeren (host & builder), Niels Hogeweg (Landschap Noord-Holland), Rene Vos (Ornithologist from Netherlands), Universität Greifswald: Tobias Dahms, Nora Köhn, Anke Nordt & Torsten Galke, Claudia Oehmke organised this field day in Kamp.

Participants

Henning Holst, Schmidt & Thürmer timber dealer, Behrenhoff – provider of the blow in technology), Christian Losehand (Strohlos Product development, Waren Müritz), Rainer Nowotny (Hemp fibres Uckermark, Prenzlau), Marlies Händschke (district manufacturers association Müritz-Demmin), Reed producers: Ralf Betge (Benz, Usedom), Dirk Henck and son (Anklamer Fähre), Karl-Heinz Spiegl (Zecherin, Usedom), Stefan Rolinski (reed thatcher and carpenter Paech), University Nijmegen: Christian Fritz, Jeroen Guerts, University Greifswald: John Cowenberg, Moni Hohlbein, Falk Ortlieb, Christian Schröder, Cosima Tegetmeyer, Maximilian Wenzel, Sabine Wichmann, Wendelin Wichtmann + Organisation team, 4 Students (who helped during harvesting of Typha in last winter)

Background

The event was mainly organised for facilitating networking and exchange of experiences of different stakeholders: providers of biomass from wet peatlands (reed farmers), processors (producers of ecological building materials) and research/development institutions that work on sustainable building materials based on biomass from wet peatlands in MV.

For the renovation of his house in Kamp, Aldert van Weeren plans to use building materials locally produced from regional Typha and reed stands. For this in early 2016 Cattail biomass was harvested near Kamp within Cinderella-Project activities (February). In the hemp factory Uckermark parts of the biomass have been processed. During the event on 07.02.2016 a first test of blowing in this material produced from Cattail carried out exemplarily with great success.

The “blow in test” was presented with a Blowing in machine from the Isofloc company by Jürgen Thürmer together with Torsten Galke. First, the filling was tested on a model example with an opaque plastic glass panel. The promotion of the material stagnated sometimes in the delivery tube due to a bottleneck between blowing device and supply hose. Finally, the insulation material has been well compacted, comparable to other blow in materials. After the filling of a sample wall was carried out, again some difficulties in filling the cavities occurred. A possible reason was the too small T-connection between the tube and the machine. Next time a larger T-connection should be used.



Fixing soft-fibre insulation tiles at the wall for preparing the „blow in test“ (left) and bottom construction details (right)



Isofloc-b' low-in machine in a container (left), first „blow-in test“ where results of filling the cavity (right)



Preparing the wall for the test (left), the result: Typha blow in material after the test and after removal of the construction plate (right) (photos: T. Dahms)

Rainer Nowotny attributed this to the fact that the blow in machine and the handling were designed for the utilisation of insulation material like cellulose. Disintegrated fibre material such as cattail blow in material or hemp tend to stick. But for blowing in there are also other technical solutions available. Other devices have to be tested.

Discussion

During the meeting, a joint project proposal on the production and utilisation of cattail insulation material in Kamp (Aldert van Weeren) was discussed to be applied under the INTERREG program North West Europe. This could contribute to the anticipated "Carbon Connect " project together with Radboud University Nijmegen, province of North Brabant (Lead Partner), GMC (subcontractor DUENE). Aldert van Weeren is registered as a resident in the Eifel and by this he is based right in the INTERREG area. The project should concentrate on monitoring of the behaviour of the insulation materials by time and investigate, how the provision of biomass could be ensured from renewable raw materials from wet peatlands (reed and cattail). An important issue to be taken into account is some long term research on the characteristics of insulating materials.

The thatchers guild has strong interest in safe conditions for licenses for reed cutting. The reed producers are faced with a decline in approved areas where they are allowed to harvest. Only a few years ago, in the National Park "Vorpommersche Boddenlandschaft" up to 150 hectares could be mown (2005). The authorizations could, however, not be extended due to nature protection. Similar conflicts exist thanks to the habitat protection law (§ 20 NatSchAG M-V) also outside of national parks and nature reserves. The possibility to cultivate quality reed on previous grasslands is a great chance to meet the demand for this regionally produced traditional building material and to avoid conservation conflicts by harvesting natural reedbeds. Therefore, there is a strong interest in the recognition of reed as an agricultural product. Marlies Händschke (thatchers guild) likes to be kept informed about activities for the recognition of reeds as an agricultural crop from the CINDERELLA project.



Christian Losehand (Strohlos company) presents different kinds of construction materials made from reed, straw and similar raw materials (left, photo: T. Dahms), right: participants are observing the "blow in test" (photo: N. Hogeweg)

Christian Losehand has continued interest in cooperation on research and development of Typha insulation material as well as reed based building materials. Various board systems (reed plate with clay plaster, sandwich fire protection plate with ~ 1cm straw / reed plates outside and ~ 5cm seagrass inside) and building hollow blocks made from reed or straw (filled with cattail blow in insulation material) were presented and their potential for utilisation was discussed.

According to statements by Rainer Nowotny (hemp factory Prenzlau), costs for treatment of Cattail blow in material amount inclusive drying to 600 euros per tonne (winter harvest : ~ 50 % water content , for further processing a reduction to ~ 15 % is necessary). In Prenzlau further Typha biomass will be processed during the next weeks.

Individual participants also visited the harvested Typha area about 3 km away from the meeting in Kamp. This area, where harvesting took place in winter, shows so far no significant impact on the Typha stands. The surface is again fully overgrown with cattails. Sampling was carried out for scientific monitoring. Here, a comparative study of different dates of harvesting done by the University of Greifswald and the University of Nijmegen in the context of the Cinderella project.



Area, where Typha had been harvested nearby Kamp in February 2016

Joint field days

After joining the Typha meeting in Kamp colleagues from University Nijmegen and Greifswald University, as well as two people from the Netherlands (Ornithologist, Landschap Nord-Holland) went to different Cinderella Sites in North-Eastern Germany (Kamp - Lower Peene Valley, Aalbude - Lake Kummerow and Rochow - Uecker Valley). Field measurements for the joint database were taken together and research activities, study methods and sites were discussed.



Choosing a Plot for harvesting in a Typha latifolia stand (left) and measuring single plants in permanent plots (right).



Typha establishment experiment in Rochow (Uecker Valley). *Typha angustifolia* and *Typha latifolia* were planted at the beginning of June in different basins with a water level gradient between 60 cm above to 20 cm below ground.



This summer we found lots *Typha* seedlings growing between the adult plants (left) at Aalbude, where we set up the second harvest experiment. The harvested plot we cut in July this year (right).



Patches of *Typha angustifolia* in Aalbude overtaking areas with water levels higher than 50 cm in summer.

Some recent project relevant publications

Bonn, A., Allott, T., Evans, M., Joosten, H., & Stoneman, R. (Ed., 2016): Peatland Restoration and Ecosystem Services. Science, Policy and Practice. Ecological reviews, Cambridge press

Joosten, H., Gaudig, G., Krawczynski, R., Tanneberger, F., Wichmann, S. & Wichtmann, W. (2016): Paludicultures: Sustainable productive use of wet and rewetted peatlands. In: Bonn, A., Allott, T., Evans, M., Joosten, H., & Stoneman, R. (Ed., 2016): Peatland Restoration and Ecosystem Services. Science, Policy and Practice. Ecological reviews, Cambridge press

Minke, M., Augustin, J., Burlo, A., Yarmashuk, T., Chuvashova, H., Thiele, A., Freibauer, A., Tikhonov, V. & M. Hoffmann (2016): Water level, vegetation composition, and plant productivity explain greenhouse gas fluxes in temperate cutover fens after inundation. *Biogeosciences*, 13, 3945-3970, 2016. <http://www.biogeosciences.net/13/3945/2016/bg-13-3945-2016.html>

Giannini, V., Oehmke, C., Silvestri, N., Wichtmann, W., Dragoni, F., Bonari, E. (2016): Combustibility of biomass from perennial crops cultivated on a rewetted Mediterranean peatland. *Ecological engineering*. Accepted

Giannini, V.; Silvestri, N.; Dragoni, F.; Pistocchi, C.; Sabbatini, T.; Bonari, E. (2015): Growth and nutrient uptake of perennial crops in a paludicultural approach in a drained Mediterranean peatland. *10 ECOLOGICAL ENGINEERING*, Issue nr. : 1