EUBCE 2024
32nd European Biomass Conference & Exhibition

EXPERT WORKSHOP
ENVIRONMENTAL SUSTAINABILITY OF CROPS FOR BIO-BASED INDUSTRIES IN EUROPE

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Question 1: Select the 1-2 types of primary crops used in industrial biorefineries producing bio-based chemicals, materials, products that you will present: what are the volumes or areas of such crop(s) in the EU and what are the uses (e.g., final products, intermediate chemicals, etc.)?

Primary crops and biomass used in industrial processes:

- Paludiculture involves cultivation wetland plants like Reed Canary Grass (RCG), which thrive in waterlogged conditions.
- Cultivation often takes place in connection with the restoration of fenlands and marginal grassland areas.
- Cultivation is being demonstrated at industrial scale including Reed (Phragmites australis), Cattail (Typha spec.), Sedges (Carex spec.) and other grass species.

Geographical distribution, areas cultivated and volumes:

- Reed Canary Grass is natural in Europe, Asia, northern Africa and North America.
- Total cultivation area in Germany in 2021 amounted to approx. 6,500 ha.
- In view of the ongoing restoration efforts, the potential area for these plants is considerable.

Key applications and products:

- Reed Canary Grass is used as fodder grass in North America and Northern Europe.
- RCG serves to produce pellets for various applications: panels, animal bedding, biofertilizer (biochar), and fuel pellets.
- Fibres and protein extraction from grass are being demonstrated for industrial-scale paper production.
- Long fibres are used for green pellet substrates or growing media. Medium-short fibres are processed for animal bedding, with subsequent nutrient recovery in horticulture. Very short fibres and dust are used as fuel pellets.

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Question 2: What are the main relevant environmental impacts related to the cultivation of the selected crops?

Key environmental impacts:

- Paludiculture and grass as feedstock improve resource utilization by using biomass that would otherwise rot on grassland and lead to emissions in composting plants.
- According to the current state of the art, neither fertilization nor the use of herbicides or pesticides is required.
- Paludiculture reduces GHG emissions by restoring mire-like conditions and preventing peat degradation.
- Replacing annual crops with permanent grassland contributes to carbon sequestration in the soil and to less nitrate leaching.
- Enhances biodiversity by creating new habitats for rare and endangered species (e.g. birds), particularly in large-scale fenland nature reserves.
- Supports protection targets for nature reserves defined by the presence of grassland bird species.
- Utilizes wetland areas that do not compete with food production, ensuring sustainable land management.
- Biomass from wetland plants is efficiently used for various products, minimizing waste and enhancing resource efficiency.
- The production process is nearly climate-neutral, with products that are biodegradable and part of the carbon cycle.

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Question 3 - What are the main 'best available practices/technologies' to grow such agricultural crops minimizing the impacts and maximizing the benefits for the environment?

Key good practices

- Introducing new land use types at a landscape scale, such as rewetted fenlands, to diversify biomass sources and enhance ecosystem resilience.
- Practice late harvest to protect wildlife and biodiversity.
- Utilize harvested biomass from rewetted fenlands to produce various products, reducing GHG emissions and preventing peat degradation.
- Ensure all products are biodegradable and can be returned to the soil, supporting the carbon cycle and sustainability goals.
- Engage farmers, local companies, and stakeholders from politics, water management, and environmental protection to leverage local expertise and ensure a comprehensive approach to biomass utilization.