



Thematic session on current research gaps in Short Rotation Crops

What do we know for sure?
What do we know more or less?
What don't we know?

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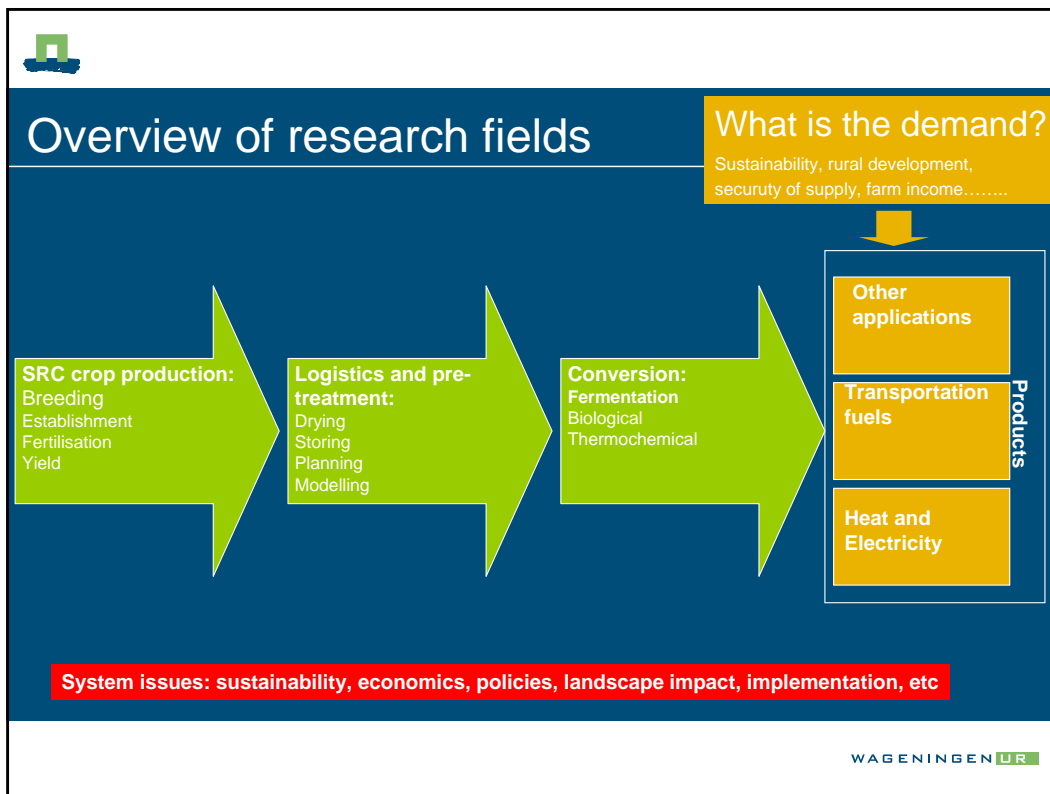
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What are the main issues in SRF Research and R&D?

- Which critical knowledge gaps have emerged from the perspective of Implementation and Agri-environmental perspective?
- In an environmental perspective should we focus on land use change, landscape effects, impacts of different cultivation practices, on direct or indirect effects?
- How do SRF, SRC or perennial grasses perform for phyto-remediation of soils, recycling of wastewater and sludge, carbon sequestration ...?
- Is there ongoing research or field experimentation performed outside of the European Union that is relevant for the European situation?

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- SRC crop production (1):**
- Establishment (seed, rhizome, risk,)
 - Pest control (Breeding / management)
 - Fertilisation:
 - Nutrient demand (how much N/P is needed N response)
 - Do we understand the mechanisms?
 - We need to understand lack of N response in Miscanthus and switchgrass!
 - Yield (potential vs practical)?
 - Database on SRC crop experiments and practical yields
 - Long term data needed
 - What do we know about stand maintenance?
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SRC crop production (2):

- Water
 - low water demand, erosion control

- Breeding demands.....
 - How to get high yield under unfavorable conditions (low nutrients, low soil quality)
 - Biomass quality
 - Water use

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Logistics and pre-treatment:

- Harvest
 - Do we have the right machinery? (will business take care of this?)
 - Harvest losses?
- Handling
- Drying
- Storage (moisture, losses) - old data available
- One step vs. 2 step system (what is best?)
- Pre-treatment (pyrolysis, pellets, torrefaction, etc) research needs?



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Conversion:

- What quality is needed?
- Ash?
- Ash quality?

- Demand for Lignocellulosic ethanol (low lignin?)
- Demand for biorefinery systems?

- SRC for biogas?
 - What is the value of dry material
 - Can you harvest during season?

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System issues:

- Sustainability
 - SRC environmental value? (biodiversity?)

 - Is it nature with production component? Is it agriculture with a large natural value?

 - GHG balance?

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Sustainability criteria under development (NL)

Principle:

- *The **green house gas of the production chain** and application of the biomass must be positive*
- *Biomass production must not be at the expense of **important carbon sinks** in the vegetation and in the soil*
- The production of biomass for energy must **not endanger the food supply and** local biomass applications (energy supply, medicines, building materials).
- Biomass production must not **affect protected or vulnerable biodiversity** and will, where possible, have to strengthen biodiversity.
- In the production and processing of biomass the **soil and soil quality** are retained or improved.
- In the production and processing of biomass **ground and surface water** must not be depleted and the water quality must be maintained or improved.
- In the production and processing of biomass the **air quality** must be maintained or improved.
- The production of biomass must contribute towards **local prosperity**.
- The production of biomass must contribute to the social **well being** of the employees and the local population.

(Cramer report, 2006)

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Implementation of sustainability criteria is still unclear:

- Distributors will have to **report** on production chain GHG efficiency – CO2 calculators developed now
- **Minimal GHG efficiency** will be required: **30% for transport fuel 70% for heat and electricity** OR reward for higher efficiency
- Discussion of inclusion of **GHG effects caused by land use change**: How to include?
- **“GHG losses due to land use change must be recovered in 10 years”?** (direct or indirect also?)

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Perspective of

- It appears that GHG balance minimal demands are in tune with WTO and EU regulations.....
 - Will low input / high output character of SRC finally pay off?
 - We need data to make GHG balance calculations!!
 - GHG effects of land conversion related to SRC
 - N2O emissions

- Will sustainability demands change economic perspectives of SRC?



System issues:

- Economics
 - How to deal with need for longtime commitment and short term economic outlook?
 - What is role of SRC in biomass feedstock mix? (by-products vs SRC)
 - Scale issues: small scale, low logistic cost, low conversion efficiency vs large scale
 - Comparative data between countries and projects



System issues:

■ Policies and implementation

- Stop/start effects of policies.
- How to get the message over to farmers?
- How to get the message to policy makers?
- How to model policy effects?

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System issues:

■ Landscape impacts:

- Visual aspects
- Landscape character
 - Openness
 - diversity
- Landscape values
 - Traditional values
 - Historic values



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■ Biodiversity:

- What are go and no-go areas for bioenergy production?

- What bioenergy systems fit best in the go areas?
 - Crop mix
 - Farming practice
 - Biomass chain

