Networking / workshop

Harvesting techniques & performance

Sabine Wichmann  
(wichmann@uni-greifswald.de)

Scope of challenges

• **Different site conditions**  
  -> open water / shores / flooded sites / low bearing capacity  
  -> very small to very large areas

• **Different plants, biomass form & processing avenues**  
  -> reed, cattail, reed canary grass, sedges, ...  
  -> chaff, bales, bundles, ...  
  -> quantity (energy biomass) / quality (construction)

• **Requirements for machinery performance**  
  -> high acreage performance  
  -> efficient logistic chains  
  -> **last but not least**: avoiding damage to soil and vegetation stands

→ Impressions of current technical solutions....
Water dominated sites

Mowing-Collecting Boats

![Mowing-Collecting Boats](www.berky.de)

![Mowing-Collecting Boats](www.aquarius-systems.com)

Truxor: amphibian tool carrier

![Truxor: amphibian tool carrier](http://doroteamekaniska.se/)

Low bearing capacity

1) Small + light machinery
2) Adapted grassland machinery
3) Special machinery: balloon tyres
4) Special machinery: tracks
1) Small + light machinery

- Mini tractor with double wheels
- Limited concerning biomass removal

2) Adapted grassland machinery

- Tractor with Terra wheels, baling press with tandem axle
- Tractor with Soucy tracks and baling press with 'tracks' (140g/cm²)

→ Depending on strong frost or limited to a better baring capacity
3) balloon tyres (Seiga)

→ Especially for harvesting thatching reed still widely used

4) Tracked vehicles

→ Currently most promising and diverse solutions in use
Harvesting in a single step: mowing + transport (chaff)

Other examples

Belarus

Netherlands (www.vanstipdonk.nl)

Poland (Foto: L. Lachmann)

Germany (Foto: S. Wichmann)
Harvesting in a single step:
mowing + transport (bales)

Other examples

Switzerland → Elbotel, loading capacity of 23 bales, ground pressure: 240g/cm²

Finnland → reed harvester to produce bales (in construction → Komulainen et al. 2008)
Harvesting in a single step: mowing + transport (bundles)

Similar examples
Harvesting in two steps:
1.) mowing + swathing / 2.) chaffing + transport

Foto: S. Wichmann

Harvesting in two steps:
1.) mowing + swathing / 2.) chaffing + transport

Foto: W. Wichmann
Other examples

Harvesting in three steps:
1.) mowing + swathing
2.) pressing round bales
3.) transport

Poland
(Foto: I. Mirowski)
Possible problems

Damages caused by:
• tracks
• repeated passages

→ sensitive parts of sites:
  – transport routes
  – unloading points
  – turning points

Possible solutions

Establising **infrastructure** on the site
• transporting biomass
• storing places

**Technical innovations**
• intelligent control mechanism for single wheels and tracks
• ...