

# Networking / workshop

## Harvesting techniques & performance



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Foto: S. Wichmann

## 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



[www.berky.de](http://www.berky.de)



[www.aquarius-systems.com](http://www.aquarius-systems.com)

## Truxor: amphibian tool carrier



<http://doroteamemekanska.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' ( $140\text{g/cm}^2$ )

→ 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

Belarus



## Other examples



Netherlands ([www.vanstipdonk.nl](http://www.vanstipdonk.nl))



Poland (Foto: L. Lachmann)



Germany (Foto: S. Wichtmann)

**Harvesting in a single step:  
mowing + transport (bales)**

## Other examples



Switzerland → Elbotel, loading capacity of 23 bales, ground pressure:  $240\text{g/cm}^2$



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



## Harvesting in two steps:

1.) mowing + swathing / 2.) chaffing + transport



## Other examples



[www.vanstipdonk.nl](http://www.vanstipdonk.nl)



[www.devriescornjum.nl](http://www.devriescornjum.nl)



[www.debeijerbladel.nl](http://www.debeijerbladel.nl)



Poland

(Foto: I. Mirowski)

### Harvesting in three steps:

- 1.) mowing + swathing
- 2.) pressing round bales
- 3.) transport



Na zdjęciu: załadowarka bali specjalnym chwytnikiem. Konstrukcja ta została zaprojektowana z dalażgu do załadunku drewna.

# Possible problems

Damages caused by:

- tracks
- repeated passages

→ sensitive parts of sites:

- transport routes
- unloading points
- turning points



Foto: C. Schröder



Foto: S. Wichmann

# Possible solutions

Establishing **infrastructure** on the site

- transporting biomass
- storing places

## Technical innovations

- intelligent control mechanism for single wheels and tracks
- ...



Poland (Foto: OTOP)



Project in Poland (A. Dubowski)