

## Willow (*Salix*) Short Rotation Coppice in Sweden

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Cultivation, on agricultural land, of fast growing *Salix* species or hybrids using dense spacing and short harvest intervals (3-5 years).

Management consists of chemical and mechanical weed control and fertilisation.

The purpose is to produce wood biomass to be used as fuel in district heating plants.

## Willow SRC in Sweden

≈ 11 000 ha (2013)

8 t DM ha<sup>-1</sup> year<sup>-1</sup>  
≈ 4 m<sup>3</sup> oil or 40 MWh  
**Energy ratio 15-20 : 1**

## Why *Salix*?

- Fast juvenile growth
- Long growing season
- Can be multiplied by cuttings => clones
- New shoots from the stump after harvest
- Can be grown on agricultural land
- Energy efficient – high energy ratio

## The salix production system

Cutting cycle for a salix plantation

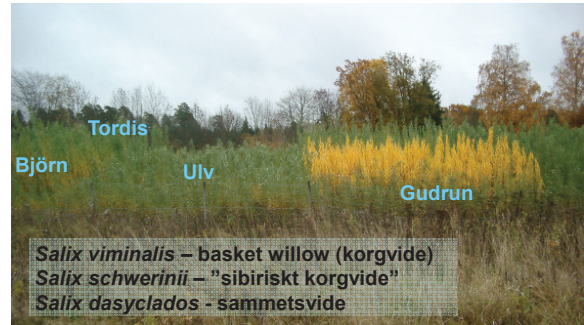
Planting

Harvest

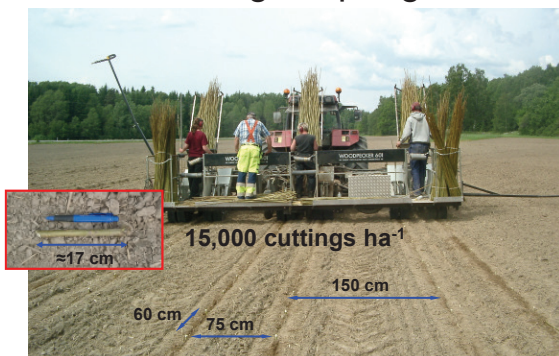
## Agricultural crop



## Choice of clone



## Planting in spring...



## The young plants are poor competitors





...and two months later...



...3-4 years later - time to harvest



### Harvest





### New harvest methods "Whole shoot harvest"

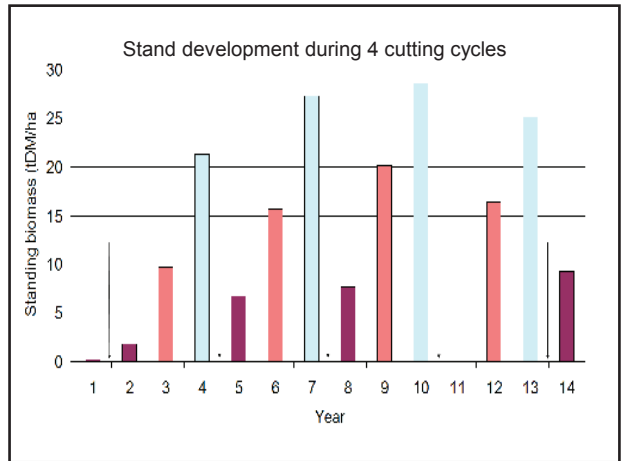


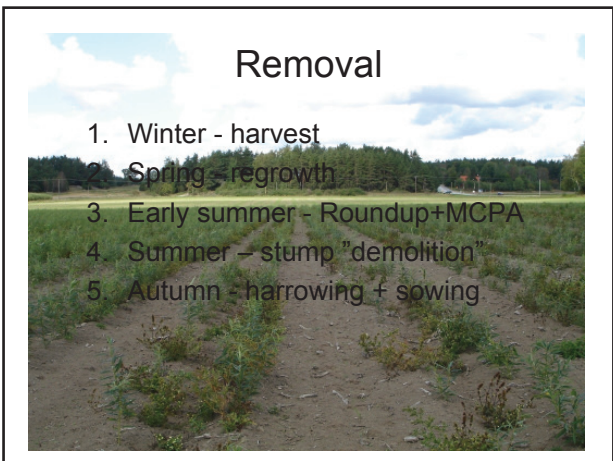
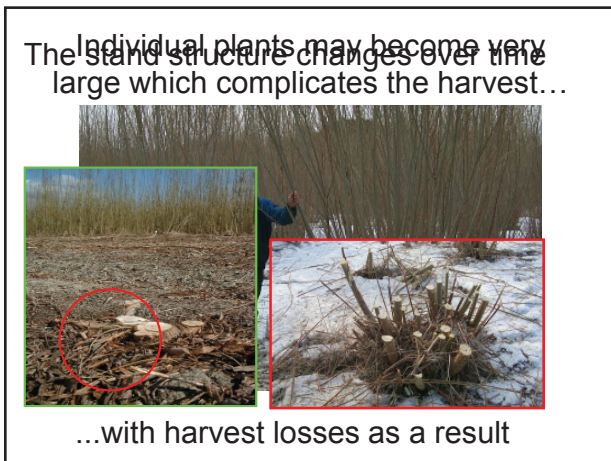
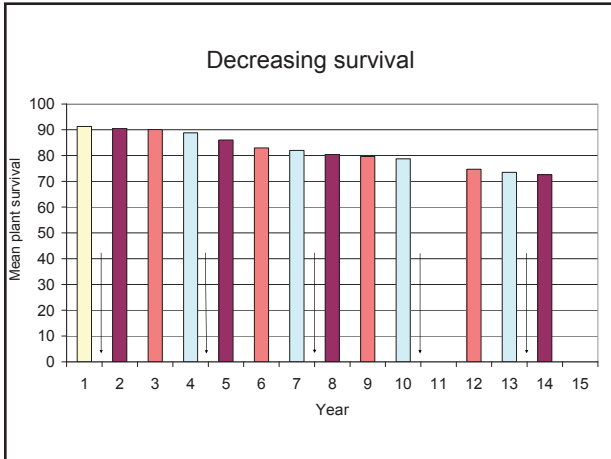
The harvest ends  
the cutting cycle

### Fertilisation









June 26, 2009 - spraying



July 26, 2009 - one month after spraying



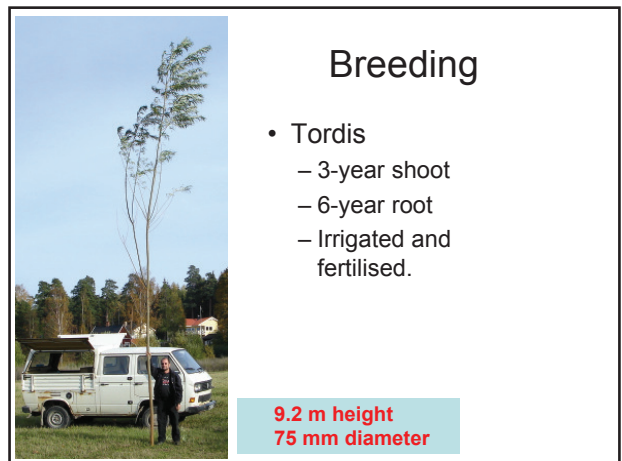
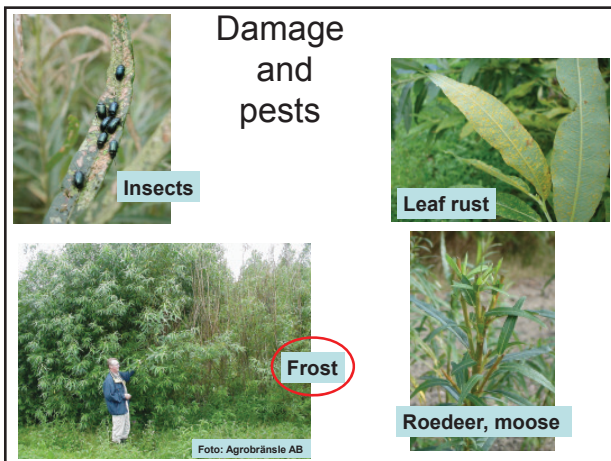
Stump removal without soil cultivation



Disc harrowing before sowing



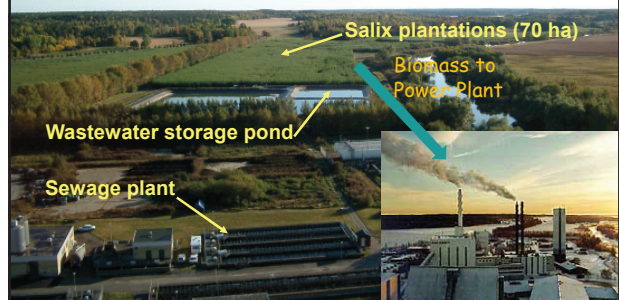




## Current use of salix

- Biomass for energy
  - renewable, domestic, env. friendly
- Phytoremediation
  - Rest products of the society = *resource*
- Other
  - Snowdrift, wind erosion, buffer zone, hunting, biodiversity, "snow sticks"

## Multifunctional salix plantations in Enköping



The waste water is stored in ponds....



...and is spread in the plantation through drip irrigation tubes

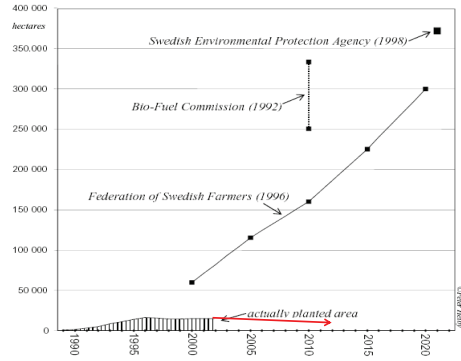


Salix cultivation is a fully developed cropping system, from planting to harvest and there is a demand for wood chips



*Should not the area planted with salix increase...?*

Figure 2: Salix in Sweden: Scenarios versus reality<sup>1</sup>



Why does not the area of salix increase?

*Economy*

*Flexibility*



*Other crops*

*Uncertainties*

*Use of machinery*

*Bad examples*

*Knowledge*

*Labour*

*Thanks for your attention!*

*Questions?*

