



Lantmännen



## Grass lignin fingerprinting

Lantmännen, SLU Umeå, SLU Uppsala and Umeå Plant Science Centre

Annie Larsson, Avdelningen för foderkvalitet R&D

” Our owners are our foundation and the key to our brand. We live off the earth, and the farmland is the basis for everything we produce, and the core in everything we do.



”

Lantmännen's assignment is to contribute to the profitability of our owners' farms and to optimize the return on their capital in Lantmännen





# Our base is in Northern Europe

- Lantmännen is an agricultural cooperative and Northern Europe's leading player in agriculture, machinery, bioenergy and food.
- We are owned by 25 000 farmers, have 10 000 employees, operations in some 20 countries, and an annual turnover of SEK 40 billion.
- We invest SEK 200-300 million annually in research and development to enhance the value from field to fork



Chairman of the Board:  
Per Lindahl



CEO & Group President:  
Per Olof Nyman

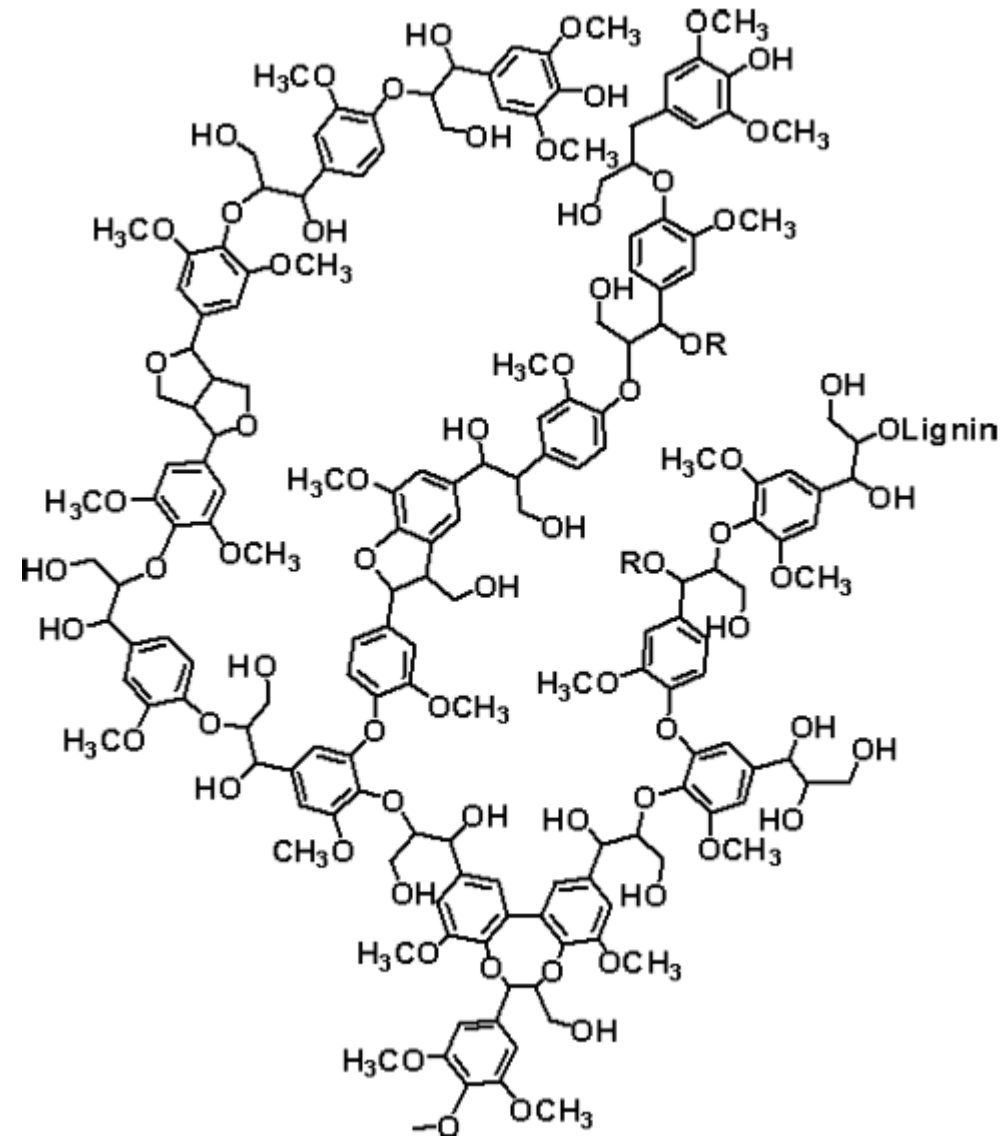


# More – and new – knowledge about forage

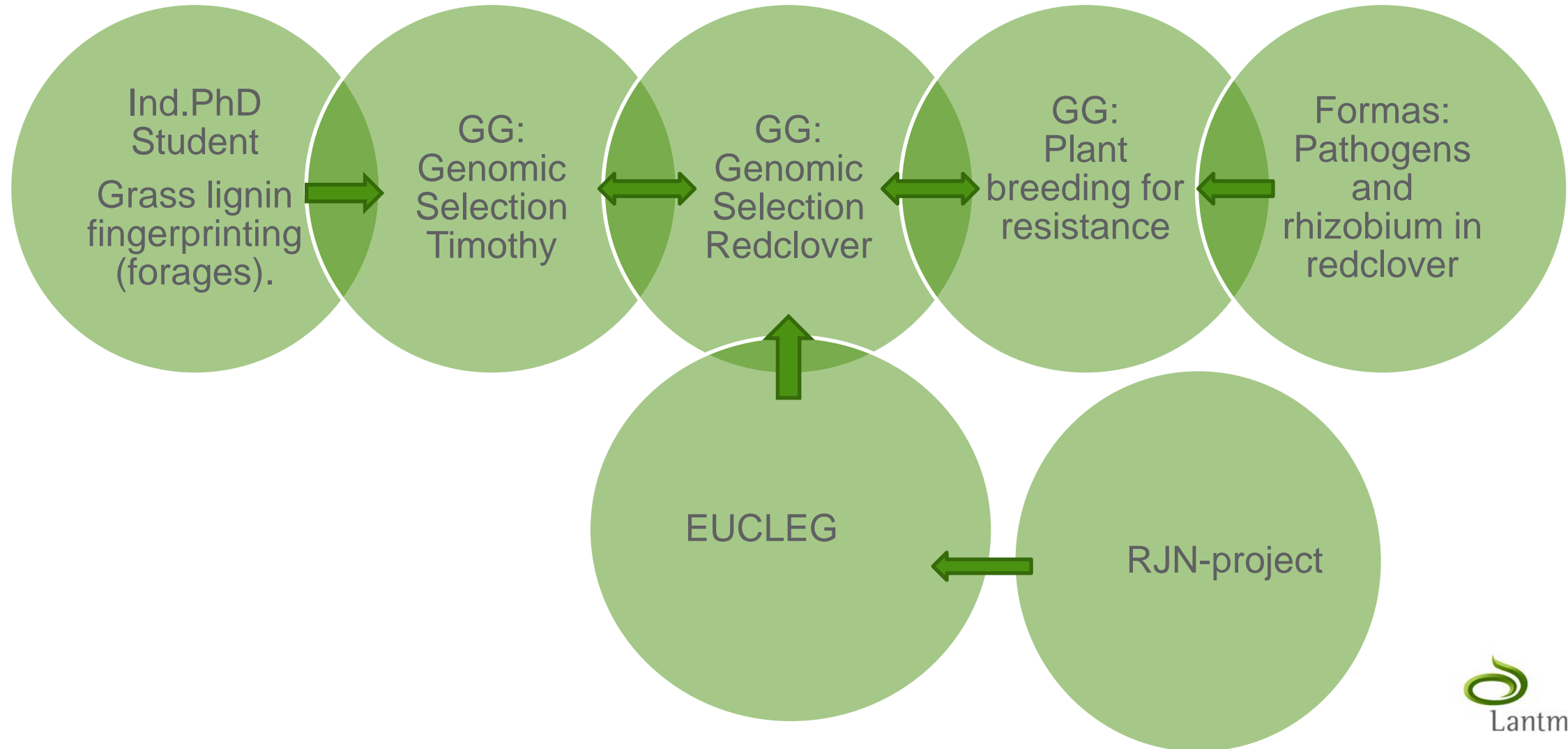
- The dairy production is important for the Swedish agriculture
- Demand for higher usage of the forage
- Not only for dairy cows
- Lantmännen is the only company in Sweden working with forage plant breeding
- Lantmännen is a key player in the concentrate-feed business

# Fiber- and ligninstructure in forage

- Increased consumption of forage
- Digestibility of fiber is very important
- Different grass species can have different lignin structures – different feed value
- Knowledge of lignin structure in plant breeding
- We need to know more about lignin in grass!



# Synergies between different projects











# Umeå Plant Science Centre

a centre of excellence

- Collaboration between Umeå University and SLU
- The Biopolymer Analytical Platform (former UPSC Plant Cell Wall and Carbohydrate Analytical Facility)
- Pyrolysis for ligninstructures
- Chromatograms

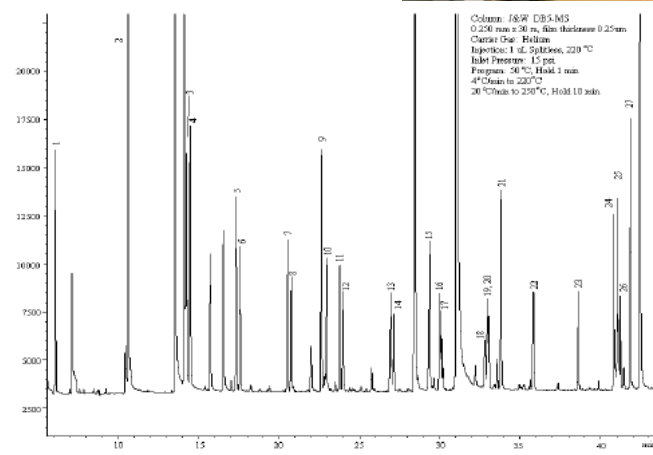
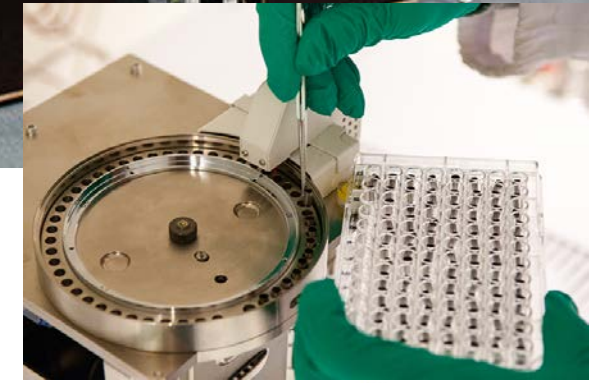


Figure 1



- 2018
  - Work with existing data of grass and red clover silages
  - Cultivation of field experiments
  
- 2020
  - Lignin analyses
  - Preparations feeding trial at Nötcenter Viken
  
- 2022
  - Dataanalyses and results of feeding trials

- 2019
  - Cultivation of field experiments
  - Analysis of samples grown 2018
  - Lignin analyses
  
- 2021
  - Feeding trials at Nötcenter Viken



# Articles

- Lignin fingerprint of grass and legume herbage in relation to in vitro measures of cattle performance
- Degradation of lignin in sheep fed grass and clover silage
- Relationships between lignin/cell wall structure and forage fibre digestion rate by high-producing dairy cows
- A meta-analysis: Factors affecting methane and urinary energy losses in grass silage-based dairy production
- Lignin composition in grass varieties for silage production



# Projectgoals

- Feedspecialist for Lantmännen
- Increased knowledge when it comes to lignin in grass
- Forage plant breeding with increased focus on fiberquality
- Better grass seed mixes
- Better strategies for growing forages, focus on time of harvest
- Optimized feedrations with better fitted concentrates
- **A more profitable and sustainable dairy production**





Lantmänn

