



HELSINGIN YLIOPISTO



EUROPEAN UNION  
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INVESTING IN YOUR FUTURE



# Energy Positive Farm - ENPOS

Hay and silage production chains  
in Finland

ENPOS Seminar - Energy use in plant production – Otepää 20 – 22 January 2010

# Mowers

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Disc mower



Drum mower



Self-propelled disc mower

# Rakes and tedders

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# Windrower or swather



# Round baler

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Round baler



Mini round baler



# Square balers – big and conventional

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Big square baler



Conventional square baler

# Silage choppers

Precision choppers or metered choppers



Flail chopper



# Loader wagon

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# Silage silos

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Clamp



Stack

Tower



# Bale wrapping with plastic

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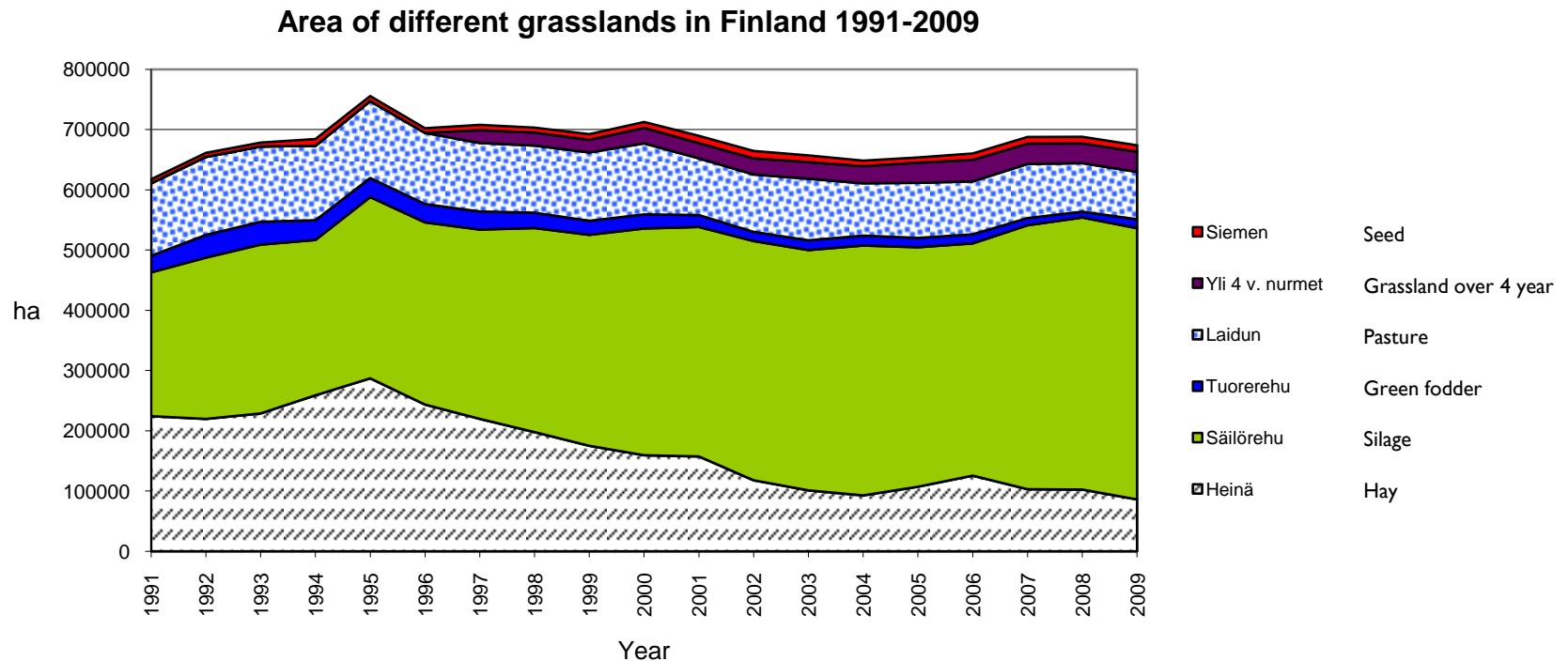
Wrapping bales one by one

Bales in a tube





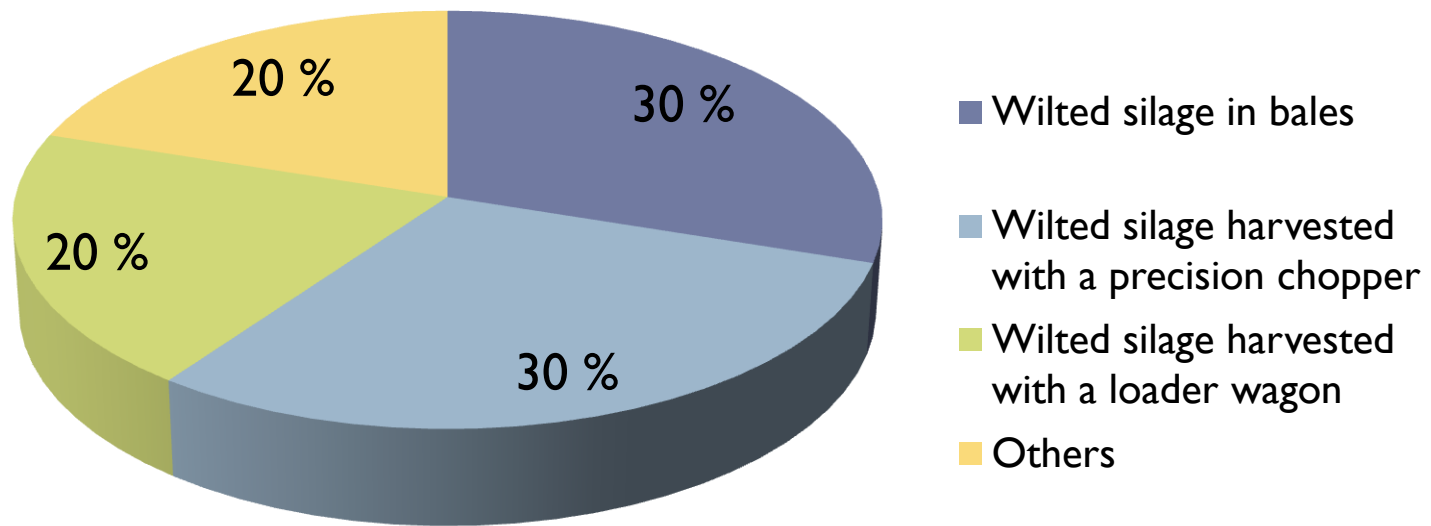
# Development of hay and silage production in Finland



Source: Niemeläinen, O. 2010. Arvio mahdollisista nurmibiomassan lähteistä bioenergian raaka-aineeksi Suomessa. Maataloustieteen päivät 2010.

# Share of different silage harvesting chains in Finland

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# Typical hay harvesting chains in Finland

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## ▶ Baler chain

- ▶ Disc mower
- ▶ Tedder/Rake (tedding 2 – 5 times, windrowing before baling)
- ▶ Baler (round, big rectangular or conventional)
- ▶ Transport to storage
- ▶ Drying in barn recommended

## ▶ Loader wagon chain

- ▶ Disc mower
- ▶ Tedder/Rake (tedding 1 – 3 times, windrowing before loading)
- ▶ Loading with loader wagon
- ▶ Transport to storage
- ▶ Drying in barn recommended

# Typical silage harvesting chains in Finland

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- ▶ Precision chopper or loader wagon chain
  - ▶ Mower-conditioner
  - ▶ Chopping and loading (additive mixed to grass)
  - ▶ Transport to the preservation site, 2-3 tractors with wagons or loader wagon
  - ▶ Tipping, spreading and compacting
  - ▶ Preservation in a clamp, stack or tower
- ▶ Wrapped bales
  - ▶ Mower-conditioner
  - ▶ Baling or chopping and baling (additive mixed to grass)
  - ▶ Wrapping
  - ▶ Transport to the field edge
  - ▶ Transport to the farm during indoor feeding season