

Conservation Agriculture - CA

An aerial photograph of a farm complex in Sweden. The farm features several large buildings, including a long red barn with a grey roof, a smaller red barn with a white door, and a large white building with a grey roof. There are also several smaller red buildings and a large white building with a red roof. A small pond is visible in the lower left. The farm is surrounded by green fields and a line of trees. A road runs along the bottom of the farm.

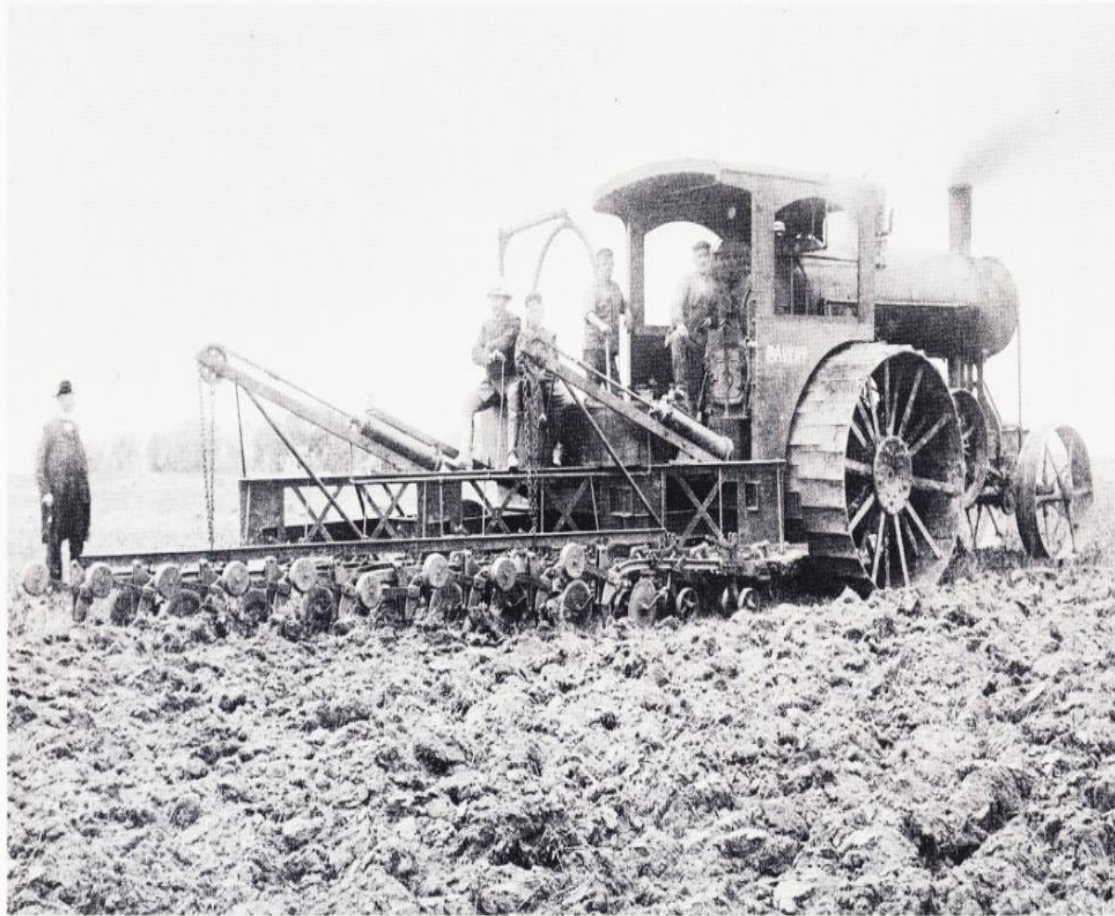
April 2018

Gårdstånga Nygård
Sweden

Gårdstånga Nygård

- 25 km north of Malmö, Sweden, latitude 55
- 200 ha organic and 700 ha good for the environment
- 700 mm rainfall
- +8°C average temperature
- Soil type: 50% heavy clay, 50 % sandy stony loam
- Team of 4 professionals manage the farm, sometimes I am allowed to drive a tractor

We know how to plough



Ångplogen vid Gårdstunga Nygård, med nio-skärig plog försedd med ånglyft. (Med vänlighet av Kulturen Lund).

Tillage history

- 2004 was last year of plowing
- 2005 plough free – 15-20 cm deep cultivation
- 2010 CTF – 10 cm deep
- 2011 Conservation Agriculture -
- 2014 Eco Conservation Agriculture
- 2017 Eco plowing re commenced



Conservation Agriculture

- Varied crop rotation with cover crops
- Aim to have 100% land coverage all year
- Biological tillage and direct seeding instead of plowing!



Crop rotations and Cover crops

1. Oil Seed Rape
2. Winter wheat
- 2b cover crop but not oil radish
- 3 Sugar Beets
- 3b no cover crop possible
4. Spring Weat
5. Winter Barley

Cover crops

- Photosynthesis takes advantage of the Sun for free
- Catching CO₂
- Plants make soil productive by increasing organic matter content
- Produces some N – reduces input
- Mixes of many different species is ideal but not allowed in Sweden ideally different varieties of winter sensitive clovers, hairy vetch, buck wheat, California Bluebell, lupines,
- Erosion control
- Direct drilling = limited nutrient losses

Cover Crops

A wide-angle photograph of a large agricultural field filled with a dense carpet of flowering cover crops. The plants are in various stages of bloom, showing a mix of green foliage and small white and purple flowers. In the far distance, a line of trees and several high-voltage power line towers are visible against a cloudy, overcast sky. The overall scene depicts a healthy, established cover crop field.

A not accepted combination of
Oil radish, Hairy Vetch, Lupines and Buck wheat

Does Cover crops matter?



Cover crops

Difference between
Conservation Agriculture and Ploughed soil
showcasing nutrient leaches.



Direct drilling

- Lower evaporation of Water and CO₂
- Better field germination
- Minimal soil disturbance
- Decreased fuel consumption = low CO₂ impact
- Weed control
- Food for worms and microbiology

Biological tillage

- Worms and micro life increasing rapidly
- Free resource instead of steel and diesel
- Direct drilling = 10 fold of earth worms per 250/m³
- Vertical tillage down to 2 m depth
- Has a turnover of plant residues to nutrient



Plowing

- Smells great
- CO2 emission in grand scale
- So far only way to control weed in organic fields
- Soil disturbance
- Increased fuel consumption = good for oil companies and CO2 emission
- Food for birds
- Reduced worms and other micro life in fields





Conservation Agriculture

- In the past – lots of steel and even more fuel
- Today - biological tillage. It is a mental process
- More focus under the soil than over
- Good spiral – increased soil fertility
- Lower weed pressure ?
- Fuel consumption decreased from 120 to 40 l/ha
- Time savings, from 5h to about 2 hour per ha
- Less machinery and labour
- LOWER COST/ha -1000 SEK compared when plowing
- and INCREASED YIELDS!