Conservation Agriculture - CA

April2018

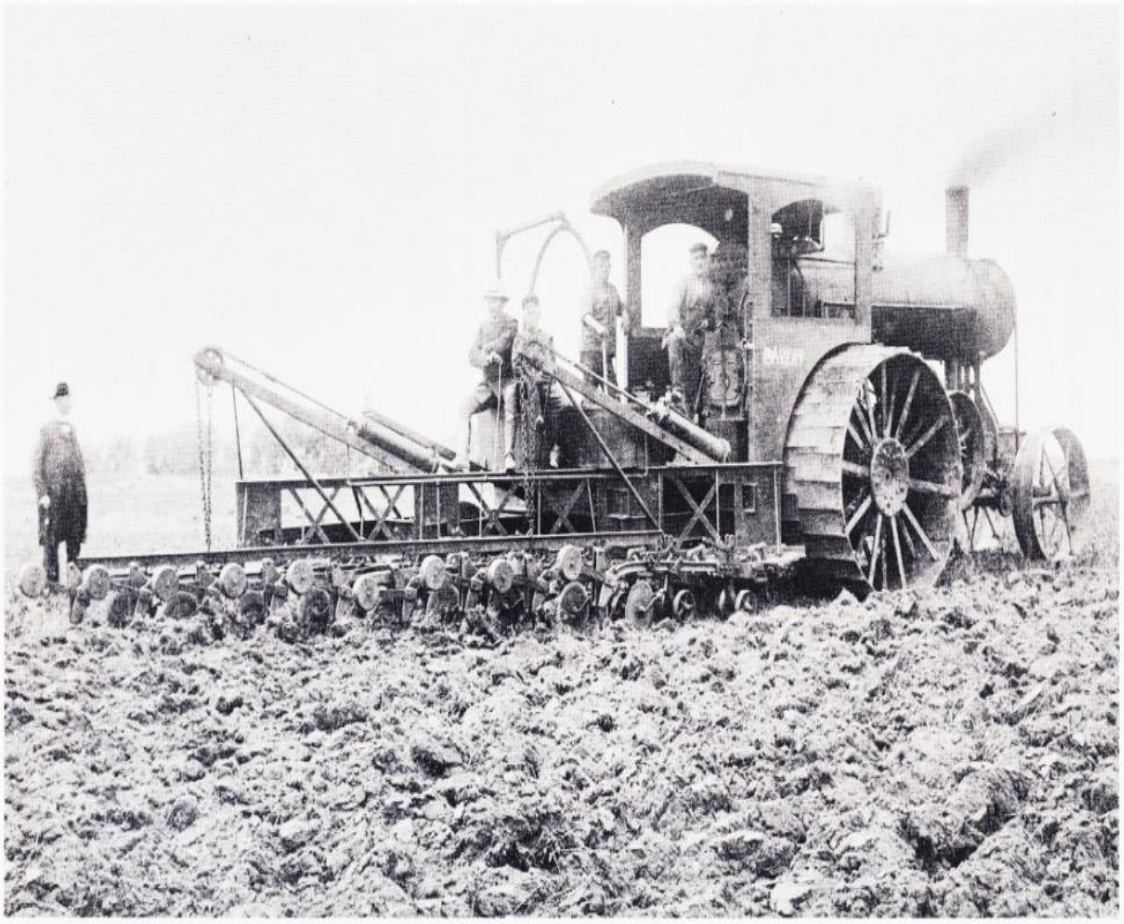
Gårdstånga Nygård

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 CO_2
- 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 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 CO_2
- Better field germination
- Minimal soil disturbance
- Decreased fuel consumption = low CO_2 impact
- Weed control
- Food for worms and microbioloby

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
- CO_2 emission in grand scale
- So far only way to control weed in organic fields
- Soil disturbance
- Increased fuel consumption = good for oil companies and CO_2 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 about2 hour per ha
- Less machinery and labour
- LOWER COST/ha -1000 SEK compared when plowing
- and INCREASED YIELDS!