The revival of Mixed Farming Systems – will dreams finally become true?

Drivers, drawbacks and directions

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Pieter de Wolf, Wijnand Sukkel, Paul Galama, Marcel Pleijte and Koos Verloop

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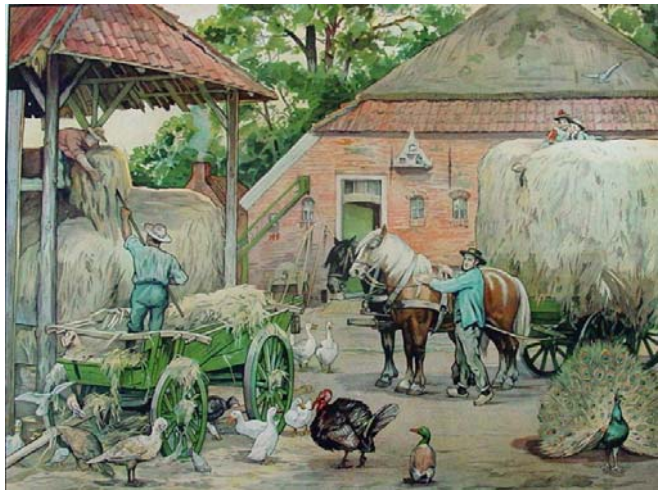
MFS is a topic since specialisation became the standard

- As a farmer said: *"through specialisation, we gained much, but we start to see that we also lost something."*

- In my view, most important losses are intangible
  - The perceived 'beauty' of the MFS (nostalgia?)
  - The idea of self-supportive systems (utopia?)



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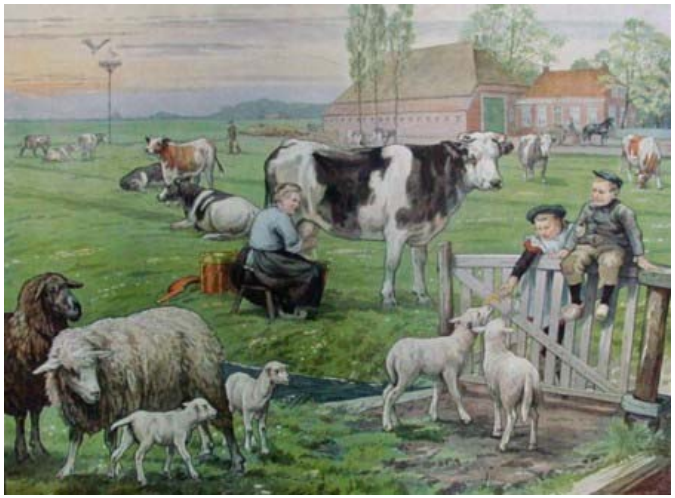
Why is the MFS concept so attractive?

- The system appeals to the value of ‘naturalness’, a balanced ecological system in which crops and animals fit into a cycle of feed, manure, crops.

- It also appeals to the value of ‘nearness’, without long-distance transportation of products/inputs.



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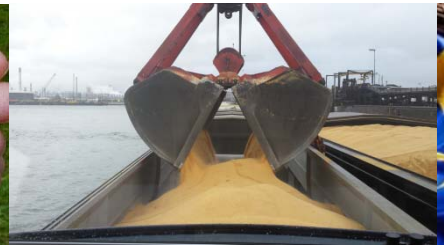
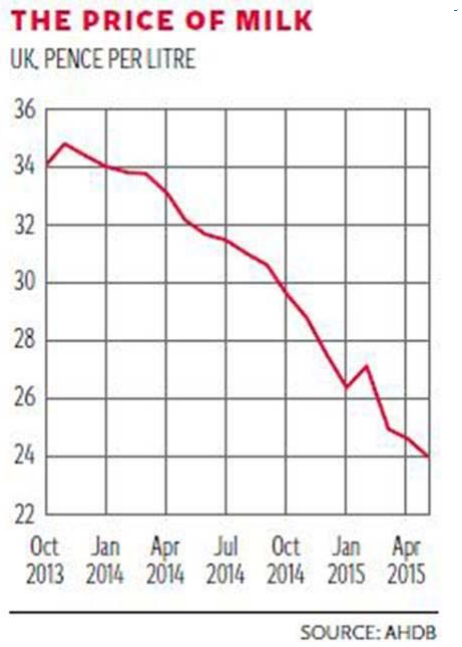
Why did we specialise?

- Because we became able to:
  - Fertilizers made crops independent from manure
  - Feed imports made livestock independent from crops
  - Because income risks were removed by the government (communist or European)
- Because it is profitable:
  - Economies of scale is also economies of specialisation
  - Regional specialisation through cost competition in open markets

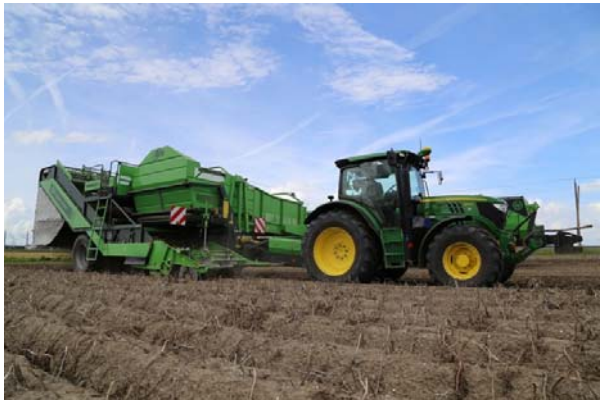
Why do we continue to specialise?

- There are some drawbacks
  - Increased income risk (neo-liberal policy)
  - Fertilizer and feed inputs are limited
  - Specialised regions have environmental problems
- But it is very difficult to 'unspecialise' or 'remix'
  - Economies of scale
  - Path-dependencies
  - Specialised context



What is the problem of specialised crop farms?

- Intensive cropping systems
  - Negative organic matter balance
  - High nutrient demand
  - High pressure on soil quality
  - Environmental impact (nutrient losses)
- Extensive cropping systems
  - Crop residues require N to decompose
  - Weed build-up / resistence development



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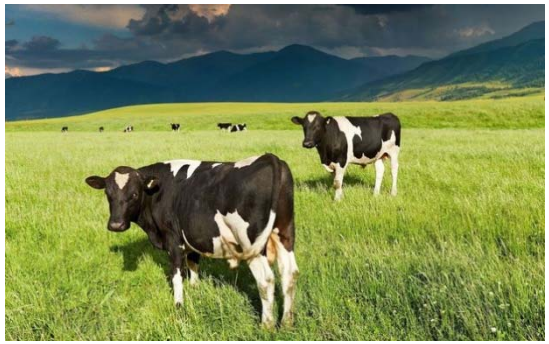
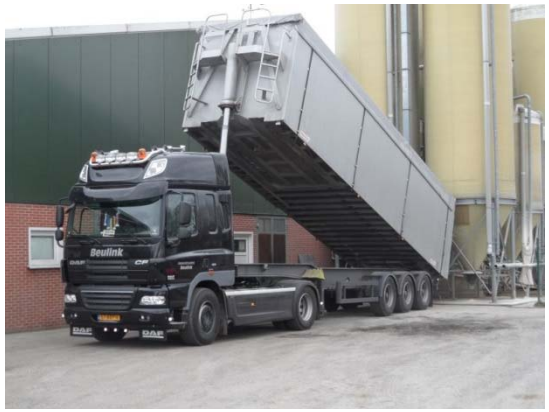
What is the problem of specialised livestock farms?

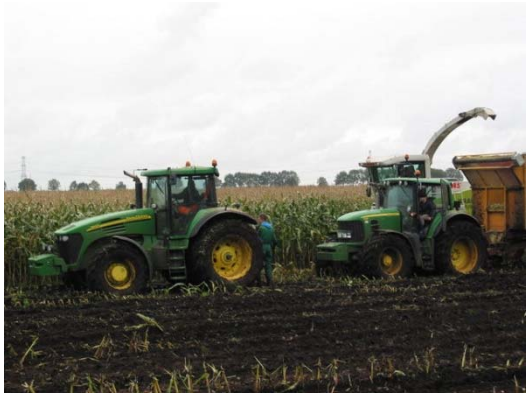
- Extensive livestock farms:
  - Depending on one income source
- Intensive livestock farms:
  - Depending on one income source
  - Depending on external inputs
  - Soil compaction
  - Nutrient losses





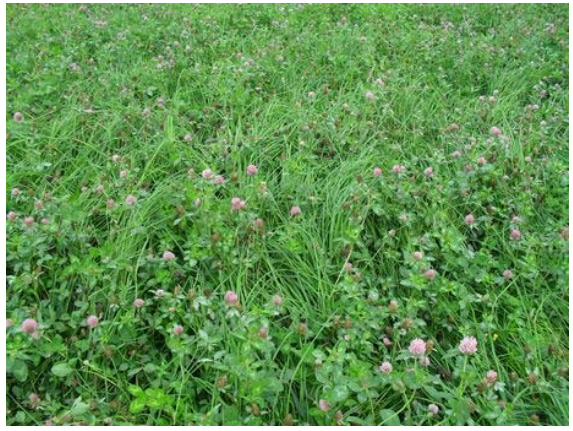
Is MFS a solution for these problems? (1)

- An example from the Netherlands
  - Arable farm, marine clay soil: 90 ha, 30 ha potatoes, 30 ha winter wheat, 15 ha onions and 15 ha sugar beet
  - Dairy farm, 200 dairy cows, 9000 liter/cow, 80 ha, 64 ha grassland, 16 ha maize
- What happens in practice:
  - Replace winter wheat partly by maize
  - Potatoes in rotation with maize
  - Result:
    - more cows, more potatoes = more income
    - Less organic matter, more soil compaction



Is MFS a solution for these problems? (2)

- What could have happened?
  - Make a rotation with all crops
  - Add 18 or 30 month (grass/clover?) ley in the arable rotation
  - Add straw to the manure
  - The outcome:
    - Better soil quality
    - Higher yields
    - Higher costs for grass in rotation
    - Carbon and nitrogen losses in transition phase



A dilemma: permanent grassland

- Positive:
  - High soil biodiversity
  - Build-up of organic matter (C-sequestration)
  - No costs for plowing/sowing
  - If managed properly: long term productivity
- However:
  - bad management (compaction, damage through intensive use)
  - Re-sowing after 5-10 years, high losses C/N
- Why not grass leys (2-3 years) in rotation with arable crops?
  - The question is about the transition phase...

Is MFS a solution for these problems? (3)

- An example from France:
  - Arable farm, calcareous soil: 300 ha, 100 ha winter wheat, 100 ha winter barley and 100 ha oilseed rape
  - Dairy farm, 200 dairy cows, 6000 liter/cow, 200 ha, 150 ha grassland, 25 ha maize and 25 ha alfalfa
- What happens in practice?
  - Arable farmer replaces 25ha of each crop by 75 ha alfalfa to the crop rotation, sells it to a company.
  - Dairy farmer buys afalfa pellets from the same company.
  - Outcome: better soil quality and weed management, but lower income for arable farmer

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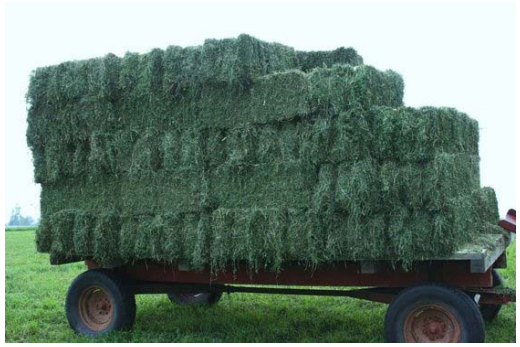
Is MFS a solution for these problems? (4)

- What could have happened?
  - Reduce all crops with 12,5 ha, add 50 ha maize and 37,5 ha alfalfa to the rotation.
  - Dairy farmer replaces alfalfa pellets by alfalfa hay
  - The outcome:
    - Better soil quality and weed management
    - Higher yields (maize, cereals, OSR)
    - Lower costs for dairy farmer
    - No income reduction for the arable farmer

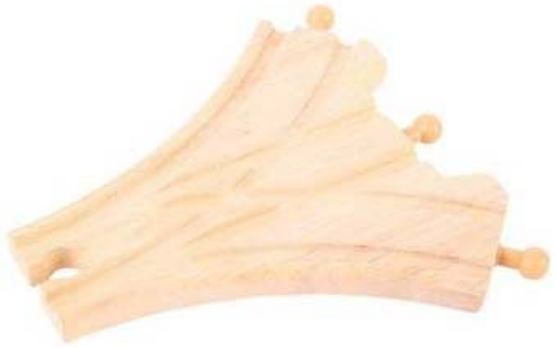


What livestock farming system would an arable farmer like to have?

- As a partner for soil quality
  - Add grassland, cereals, leguminous crops to the rotation or buy these products
  - Take care of soil structure, health and fertility
- As a user of by-products and crop residues – pigs?
- As a producer of manure, preferably in two types:
  - To replace fertilisers (N, K)
  - To improve soil quality (organic matter, nutrients)

Back to MFS development

- Three options
  - The current status: intermediaries generate a living from trading between specialised crop and dairy farms
  - The extreme: specialised farms ‘unspecialise’ (crop farm starts with livestock production, or the other way around)
  - The middle: specialised farms cooperate, either small scale (neighbours) or regional/cooperative



How to compare them?

	MFS at farm level	Cooperative / regional MFS	Commercial relationships
Economies of scale	--	+	+
Transaction costs	--	-/+	+
Financial risk profile	+	-/+	-
Organisation costs	-	+	?
Input efficiency	-	+	++
Farmer independency	-	+/-	+
MFS perspective	++	+	-

Cooperative / regional MFS as favourite?

- Combines most advantages of both extremes
  - Maintains specialisation advantages at farm level
  - Diversity allows input optimisation
  - Scale allows professional organisation
- Requires overall MFS perspective and coordination
  - All participants should benefit
  - Long term perspective
- Cooperatives are not very popular in some countries...

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As a conclusion

- Should we promote MFS?
  - No – not as a generic solution for all problems
  - Maybe – as a concept to balance livestock and crop production with limited external inputs
  - Yes – if only with clear objectives and boundaries
  - Yes – if made specific for specific conditions and situations

- MFS will only become reality if the advantages outweigh the benefits of specialisation

Thanks for your attention!

For more info or questions:

Pieter.dewolf@wur.nl