The Dutch way: farming without conventional manure

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Beginning of this century:

• Many farms (arable, horticultural) use manure from conventional farming
• Manure from intensive conventional farming not allowed (EU)
• Surplusses of P in farm mineral balances
Is this a problem?

- Imago: real organic farming
- Risk: input of undesired materials
- Environment: surplusses of P
Accumulation of $P$ in soil and plant uptake over time, showing a decrease in water-soluble $P$ with increased length of organic farming. The graph is adapted from Bokhorst (2011): Bemesting in de biologische akker- en tuinbouw bij bodems met een hoge fosfaatstoestand.
Action!

• Governmental pressure
• Farmers association came with a plan:

- Step by step obligatory more use of manure from organic origin. List of “A” manures (organic), B (conventional, allowed) and C (not allowed)
- Obligation to sell organic manure within the organic sector
- Manure exchange platform
Step by step:

<table>
<thead>
<tr>
<th>Year</th>
<th>Planning Minimum %</th>
<th>Year</th>
<th>Realized Minimum %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>50%</td>
<td>2010</td>
<td>50%</td>
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<tr>
<td>2012</td>
<td>60%</td>
<td>2012</td>
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<tr>
<td>2014</td>
<td>70%</td>
<td>2015</td>
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<tr>
<td>2016</td>
<td>80%</td>
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<tr>
<td>2018</td>
<td>90%</td>
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<td>2020</td>
<td>90/100%</td>
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Expected challenges:

• Shortage of organic manure
• Disbalance: poultry manure not desired by arable / horticultural farmers (N/P ratio)
• Increased price for organic manure (negative price for organic poultry manure?)
Adaptation of soil fertility strategies (1)

Dairy farms

Sell manure, buy P and K (if needed; based on farm mineral balances). Clover-grass does not need N-applications.
Adaptation of soil fertility strategies (2): Arable / horticultural farms

More effective / efficient use of N:
• less manure
• intelligent rotation / crop choice
• intelligent manure choice and application
• increased farm-based N-fixation
• catch crops for N-transfer fall -> spring
Two tools

- Cut&Carry fertilizers
- Model calculations of N-availability: the NDICEA model
Cut & Carry fertilizers

clover-grass or lucerne, cut, and applied ON ANOTHER FIELD

Degrees of freedom* for Nitrogen (compared to mulching or ploughing):

• Time
• Amount
• Location

Results: see [www.louisbolk.org](http://www.louisbolk.org), publications, maaimeststof

- Free download
- Easy to use
- Danish / English

Output:
- Nitrogen availability
- Leaching
- Organic matter
- Mineral balance
NDICEA

Kvælstof: kumulativ udvaskning og denitrificering undergrund [kg/ha].

Organisk stof i mullag [%]

Forløb 1
Example of use of C&C fertilizers and NDICEA:


10 reports hard-copy available here
Thanks for your attention

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