Focus on Nutrients, a voluntary on-farm initiative for environment and economy

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Goal

Started 2001 to meet government environmental objectives...
* Zero Eutrophication
* A non-toxic environment
* Reduced climate impact

Later: International goals as BSAP, WFD, …

…and at the same time increase farmers income

Photo: Stina Olofsson, Algae bloom, Gotland 2005
"The Focus on Nutrients" project

The project is run as a co-operation between:
› Swedish Board of Agriculture
› Federation of Swedish farmers
› County administrative boards
› Advisory firms
Vulnerable zones according to the EU Nitrates Directive

Explanation:

Big lakes

Counties

Areas sensitive to nitrates 2014

75% of arable land in Sweden
Swedish action for zero eutrophication

1980

Introduction of new legislation: Storage and spreading of manure

1990

Green cover on arable land during winters

Rules for incorporation of manure

1995 Sweden becomes a member of the EU and the implementation of the Nitrates Directive

1995

New rules for covering manure containers

2000

2001 Focus on Nutrients starts in southern Sweden

New rules for no. of animal units per ha

2010

New vulnerable zones are identified

Subsidies for cover crops and spring cultivation

2014 Focus on Nutrients is working in most counties of Sweden

First action plans in WFD
Based on individual advice and on-farm education
- 50 000 farm visits have been made, by 270 advisors, to help farmers to reduce nutrient losses and improve environmental sustainability
- Farmers (and farm-advisors) are included in decisions in all levels of the campaign

The objective is to increase awareness and knowledge in order to change behaviour.
Project is characterized by

› Voluntary participation

› Repeated farm visits

› Farm-specific measures

› Follow-up on each farm
Farmer members

› 8 500 farmers have a membership, 1 million ha
› The main focus is farms with > 50 hectares and/or > 25 animal units
› Funded by the Swedish Rural Development Program
Effective production = reduced losses

- Improved nitrogen and phosphorus effectiveness lead to less emissions of climate gases and nutrient losses
Topics during 5825 farm visits year 2014-2015

- Nutrient balances: 32%
- Fertilization: 9%
- Precision farming: 2%
- Soil structure: 8%
- Plant protection: 5%
- Ley production, grazing: 7%
- Climate, energy: 14%
- Barn environment: 4%
- Feeding: 12%
- Wet lands: 7%
A balance is calculated at the first visit and after 2-3 years. Input data and results are stored in a database.

The database contains data from more than 8500 farms (in average 2 balances/farm).

In addition to nutrient balances calculated by advisors at the farm visits, nutrient balances can be calculated online by the farmers themselves.
Why are nutrient balances of interest?

› It is a quick calculation and input data gives fairly precise figures
› It fits in an advisory situation where the advisor can help the farmer with the interpretation
Nutrient balances*, change in surplus in five years

<table>
<thead>
<tr>
<th>Type of farms</th>
<th>Number of farms</th>
<th>Balance at the first visit kg/ha</th>
<th>Decrease in nitrogen surplus, kg /ha</th>
<th>Decrease in phosphorus surplus, kg /ha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crop</td>
<td>965</td>
<td>45 N, -1.4 P</td>
<td>7.5***</td>
<td>2.6***</td>
</tr>
<tr>
<td>Dairy</td>
<td>976</td>
<td>143 N, 4.7 P</td>
<td>8.6***</td>
<td>1.8***</td>
</tr>
<tr>
<td>Pig</td>
<td>204</td>
<td>104 N, 7.6 P</td>
<td>13.5**</td>
<td>6.4***</td>
</tr>
</tbody>
</table>

*** p<0.001, ** p<0.01

*Farm gate balances of conventional farms during the years 2001-2013, in southern Sweden, > 4 visits and 2 balances on each farm, 5-6 years from the first to the second balance
Decrease in nitrogen surplus on farms with different production

Blue: Less N in mineral fertilizers is imported to the farm
Green: More N in harvest products leaves the farm
Yellow: Less N in fodder is imported to the farm
Orange: Less N in animal products leaves the farm
Brown: More N in manure leaves the farm

Crop farm
blue***, green*

Pig farm
yellow*, green*
orange and blue ns

Dairy farm
blue**, yellow*, brown*
Decrease in phosphorus surplus on farms with different production

Blue: Less P in mineral fertilizers is imported to the farm
Green: More P in harvest products leaves the farm
Yellow: Less P in fodder is imported to the farm

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<td>blue***, green***</td>
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![Graphs showing decrease in phosphorus surplus for different types of farms]
Nutrient Balances (farm gate) on 89 dairy farms in southern Sweden

Repeated visits with nutrient balance calculations. Impact on nitrogen and phosphorus surpluses, during 2001-2013
The decrease in transport of nutrients from agricultural land in Sweden due to measures done, have had the intended effect.

The decrease in transport of nutrients in rivers, has for nitrogen been 20-30 % in ten years, and has been greatest in regions where most measures have been done and where Focus on Nutrients has been ongoing (Fölster et al., 2012, SLU).
Support in the Rural development program

Environmental support schemes
Cultivation of ley
Catch crops, spring cultivation
Riparian buffer zones
Maintenance of ponds and wetlands

Environmental investments
Construction of wetlands
Different investments for improved water quality
Two step ditch
Controlled drainage
Water catchment groups

› discussions in groups about measures 3 - 6 times during 1,5 to 2,5 year to solve a local problem with e.g. flooding
› 1350 participants on this meetings since 2011
Focus on nutrients

Focus on Nutrients is the largest single undertaking in Sweden to reduce losses of nutrients to air and water from livestock and crop production. The project also focuses on the safe use of crop protection products. Focus on Nutrients is a joint venture between The Swedish Board of Agriculture, The County Administration Boards, The Federation of Swedish Farmers and a number of companies in the farming business.

The purpose of the project is to:

- reduce losses of the greenhouse gases, nitrous oxide, methane and carbon dioxide
- reduce losses of nitrate from farmland
- reduce ammonia emissions from manure
- reduce losses of phosphorus from farmland
Did you calculate? on a dairy farm

Fast incorporation of manure into soil
6 000 SEK per year

Reduced age at first calving
46 000 SEK per year

Increased forage use
57 000 SEK per year

Pre-cooling of milk
3 400 SEK per year

Analysis of manure
9 000 SEK per year

Improved use of grazing
14 400 SEK per year
› 75% of farmers experience that they become more environmentally friendly after advisory visit

› That is outstanding compared to other competence building efforts in Swedish RDP
Four important experiences

1. **Repeated visits** are key to influence changed behavior

2. The advisor always has to relate to how measures taken will influence **farm economy**

3. It is important to **inform farmers** about the **progress** and make them proud of their achievements – preferably through the press

4. To inspire change the visits need to be **voluntary** for the farmer
Good knowledge and management and techniques will improve both the economy and environment!

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Tank you for your attention!