

KNOWLEDGE ON THE STATUS OF  
**NUTRIENT BOOKKEEPING**  
IN THE BALTIC SEA COUNTRIES

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## Legal Background

### □ **Countrywide ordinances**

- A ban on spreading more phosphorus with animal manure than is removed with the crop at harvest. The limit is **22 kg** phosphorus per hectare.

### □ **Additional regional regulations**

- A ban on spreading animal manure during november – february
- At least half the arable land in southern Sweden must be covered with vegetation during winter to capture the nutrients in the soil.

## Legal Background

- Storage facilities for animal manure must have a capacity of at least 6-10 months of storage depending on animal species and number of animals
- Manure spread in the field must be tilled under within four hours in southern Sweden in order to decrease ammonia losses.
- In the NVZ the development of fertilization plans is obligatory for nitrogen fertilization.

## Parties involved

### □ Authorities

- Swedish Board of Agriculture
- Swedish Environmental Protection Agency
- Swedish Agency for Marine and Water Management
- County Administrative Boards
- Municipalities

### □ Professional association

- Advisory consultants
- Federation of Swedish Farmers

### □ NGOs

- Swedish Society for Nature Conservation
- WWF

## 30 years of work on

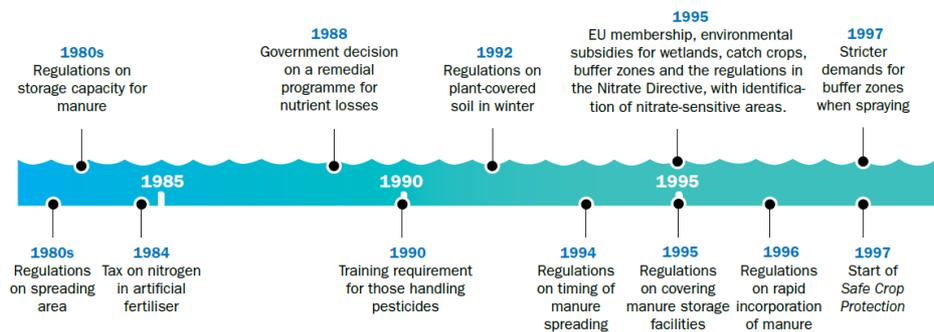
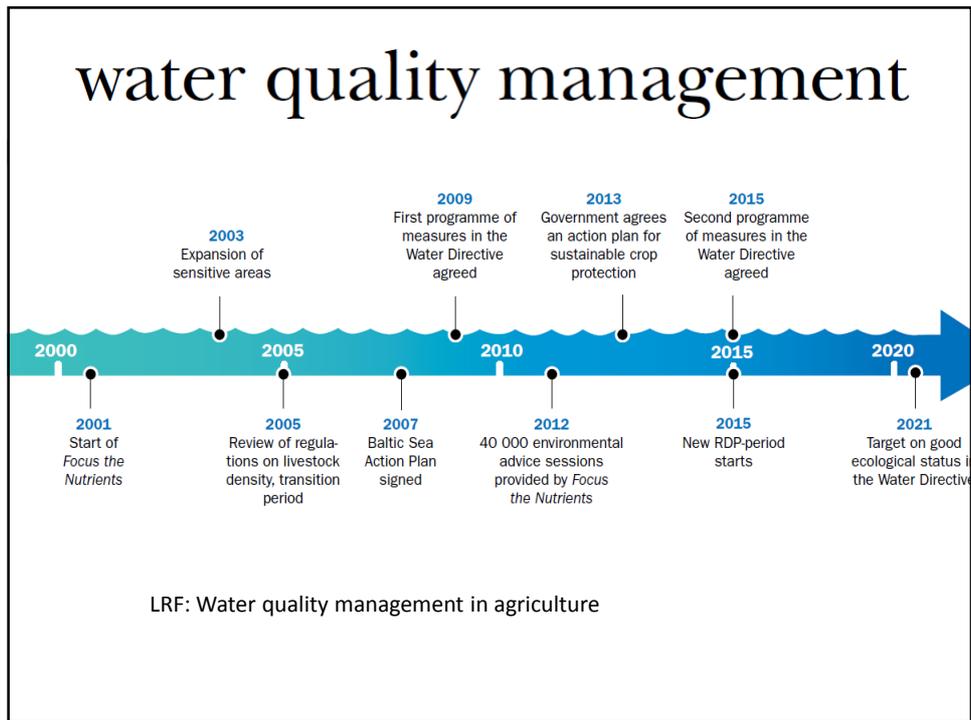


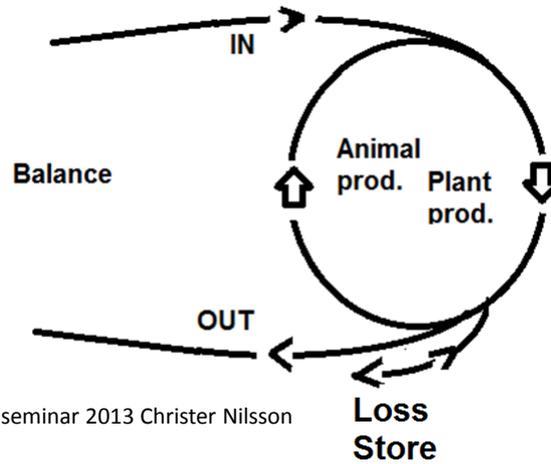
PHOTO COVER AND ABOVE LRF/ESTER SORRI, STOCKBYTE, COMSTOCK IMAGES



## Methods

- Bookkeeping methods for fertilization plans
- Balancing methods
  - ▣ Farm gate nutrient balance
  - ▣ Field balances
  - ▣ Considered input and output
    - Incoming: animals, fodder, seed, fertilisers, bought manure, biogas slurry, waste products, sewage, N-fix, atm deposition
    - Outgoing: animals, animal products, dead animals, sold manure, sold fodder, yields
    - Within system: own fodder, live weight increase, own manure
    - Hidden – soil organic matter balance

## Farm gate balance



Baltic Deal seminar 2013 Christer Nilsson

## Implementation

- Advisory services
  - Guidelines for fertilizing and liming
  - “Focus on Nutrients”
- Implementation
  - 5000 farm advisory visits /year
  - 46% of all advisory visits are nutrient balance calculations
- Control
  - Counselling tool
- Consequences
  - No regulation

## Assessment of effectiveness

- Assessed parameters
  - Surplus - kg and kg/ha
  - Efficiency - Out /In - %
  - Other key values related to production and economy
  - Empirical equation for calculating leaching
  - Inefficient use of nutrients not only indicates a risk of losses, but also represents a substantial financial loss for the farmer.

## Changes

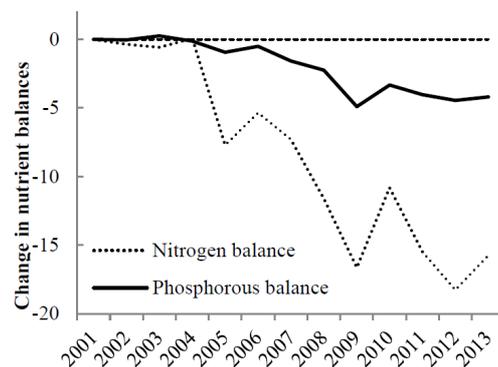


Figure 1. Illustrating the change in nutrient balances.

Advisory services for nutrient utilisation.  
 AgriFood Economics Centre Working Paper nr  
 2015:1.

## Advancing nutrient balances

- Advantages of the current system
  - Relatively simple to do and relatively accurate
  - Knowledge: flows and amounts in circulation
  - Best way to measure phosphorous (and K)
  - Actions can be discussed
  - Can be made yearly, trends can be analysed
- Potential need of improvement and difficulties
  - More focus on phosphorous
  - Better knowledge of surplus variations and relations to N- and P-leaching

## A permit fee system for nitrogen and phosphorus

### Swedish EPA

Providing agriculture with emissions caps requires considerable research and development work in order to find a method with which to determine how to formulate the emissions cap and which consequences such a regulation could have ( EPA Report 6345, 2010)

### Federation of Swedish Farmers

On farm level the data quality and the model prediction have **uncertainties**, which are not small enough to be of any practical use in a cap and trade system. No existent model can calculate diffuse nutrient leakages from agricultural land with transparent and requested confidence

## Summary

- Nutrient balance, a good tool to observe trends and efficiency in production of milk, animals and crops
- Voluntarily
- Input figures are too uncertain for using nutrient balances as mandatory regulation tools.
- Surplus in a nutrient balance is not = N- and P-losses to water
- “Focus on nutrients” result in better farm economy and decreased nutrition leakage to the Baltic sea