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

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Content

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Legal Background

- Nitrate degree
  - Implementation of the NiD in the whole country
  - Obligatory
  - Total and soluble N in parcel level, spreading time, yield level

- Agri-environmental scheme
  - Part of the RDP
  - Voluntary (more than 90% of the field area)
  - Nutrient bookkeeping (N,P), type of fertilizer, spreading time, yield level, soil organic matter, and P-level
Parties involved

- Ministry of the Environment and Ministry of Agriculture and Forestry (MAF)
  - Legislation

- Agency for Rural Affairs
  - Implementation

- Centre for Economic Development, Transport and the Environment
  - Implementation, control and payments

- Municipalities
  - Implementation and payments, control at farms (NiD)

- Natural Resources Institute Finland (Luke), Finnish Environment Institute, University of Helsinki
  - Research and monitoring

- Union of Agricultural Producers and Forest Owners MTK, ProAgria (advisory service)
  - Lobbying, advisory
Methods

- Bookkeeping methods are not regulated
- Balancing methods
  - Voluntary calculations (N & P)
  - Calculations part of field planning programs
  - Field level calculations at farms (gate balances/farm level balances rare)
  - Country and regional level calculations made by research
Methods

- **Nitrogen**
  - Fertilization: Soluble N, table or analyzed values (75% when spreading manure in autumn -> 2014, now 100%), total N for research purposes
  - Crops: calculations based on protein content or table values, straw if utilized

- **Phosphorus**
  - Fertilization: Total P, table or analyzed values (85% manure P, now 100%)
  - Crop: Table values, straw if utilized

- Seeds and N2-fixation included sometimes
- Yield level estimated or measured by farmers
- Exact amount of organic fertilizer difficult to determine
Nutrient balance (soil surface balance) – indicator to nutrient utilization

Nutrients to field: fertilizer, manure

Nutrients from field: main crop and e.g. straw yield

Nutrient balance

High nutrient balance = nutrients (€) left in the field and money (€) lost + leaching into waters and air emissions

Kuva: Ville Heimala

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Implementation

- Advisory services
  - Voluntary part of the new and supported advisory system (RDP)
  - Data analysis -> next year’s cultivation planning
  - Data used in creating new advisory materials and services

- Grain companies
  - Data collection and nutrient balance calculations for farmers (thousands of farms)
  - Advisory material

- Voluntary system -> no control or consequences
Implementation

- Research (Luke)
  - National NP balances for Eurostat and OECD
  - Regional balances for MAF to follow the nutrient use efficiency of regions
  - Total NP

- Research project (Luke)
  - Field based NP balances collected from different farm datasets
  - Both soluble and total N if available
  - Approximately 180,000 observations
Assessment of effectiveness

- Farmers can compare nutrient use efficiency to other farms
  - Balance kg/ha or
  - Utilization %

- High balance -> lost nutrients and money

- Better comparison values needed – research project (Luke)

- Effect of uncontrolled climate conditions to the balances can be remarkable
Advancing nutrient bookkeeping

- Advantages of the current system
  - Voluntary, no financial consequences for farmers
  - More attention is paid to fertilization levels

- Potential need of improvement and difficulties
  - Comparison values still missing
  - Calculation systems should be harmonized
  - Soil P-level should be taken into account
  - N2-fixation mainly ignored
  - Grassland: P-fertilization in one dose for many years
  - Organic fertilizers: release of organic N
  - Measuring of organic fertilizers and yields (especially grasses)
Summary

- Nutrient balance calculations are tested in many levels but routine is still missing.
- Cultivation planning programs produce balances automatically BUT more attention should be paid to what balances mean and how to utilize them in fertilization plans.
- More comparison values needed.
- Harmonization of methods.
- Balances are affected by uncontrolled factors.
National nitrogen balance for total utilised agricultural area

Low balances 1992-1995
Period of fallowing
20-30% not cultivated
National phosphorus balance for total utilised agricultural area

Low balances 1992-1995
Period of fallowing
20-30% not cultivated

Inorganic Fertilisers  Manure  Harvest  Balance

P kg/ha
Nitrogen balances