

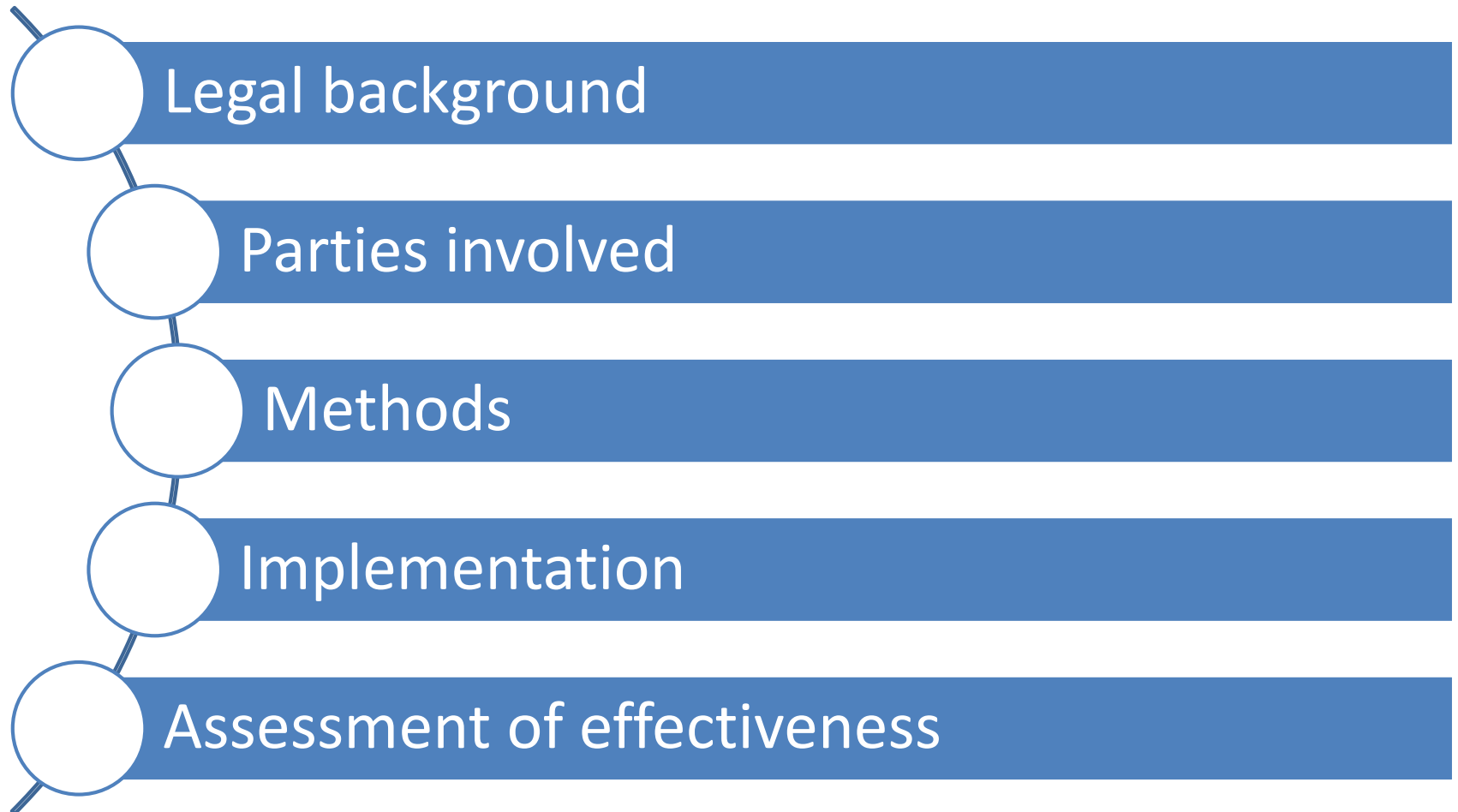
KNOWLEDGE ON THE STATUS OF
NUTRIENT BOOKKEEPING
IN THE BALTIC SEA COUNTRIES

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Content



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
 - Freely available nutrient balance calculators in internet e.g. [http://www.ymparisto.fi/fi-FI/TEHO Plus/Laskurit](http://www.ymparisto.fi/fi-FI/TEHO_Plus/Laskurit) or [http://www.agrimarket.fi/Maatalous ja Elaimet/kasvuohjelmat/viljat/ravinnetaseanalyysi/](http://www.agrimarket.fi/Maatalous_ja_Elaimet/kasvuohjelmat/viljat/ravinnetaseanalyysi/)
 - 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



Kuva: Ville Heimala



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

Implementation

- Advisory services
 - ▣ Voluntary part of the new and supported advisory system (RDP)
 - ▣ Data analyzation -> 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

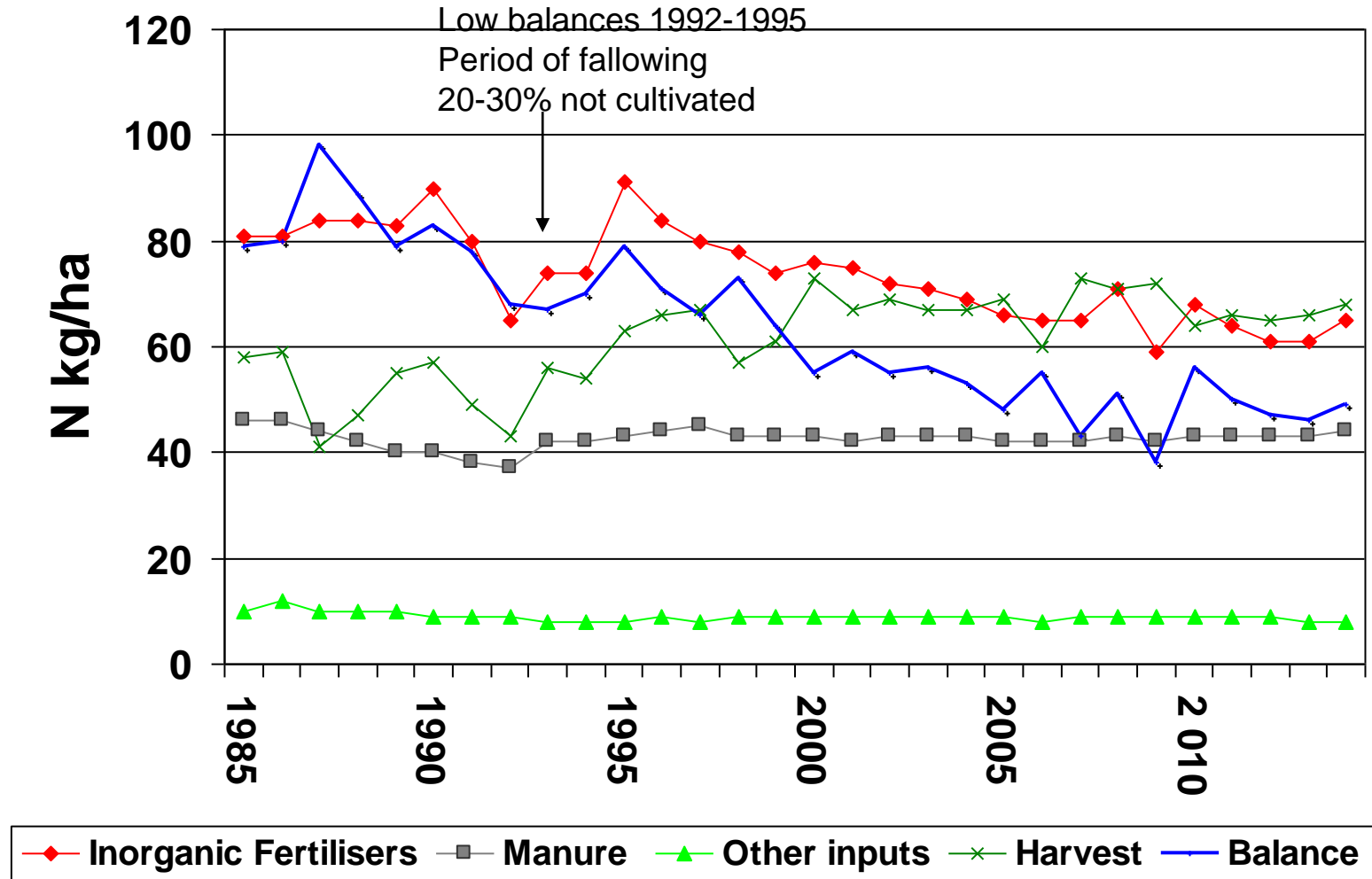
Advancing nutrient bookkeeping

- 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)

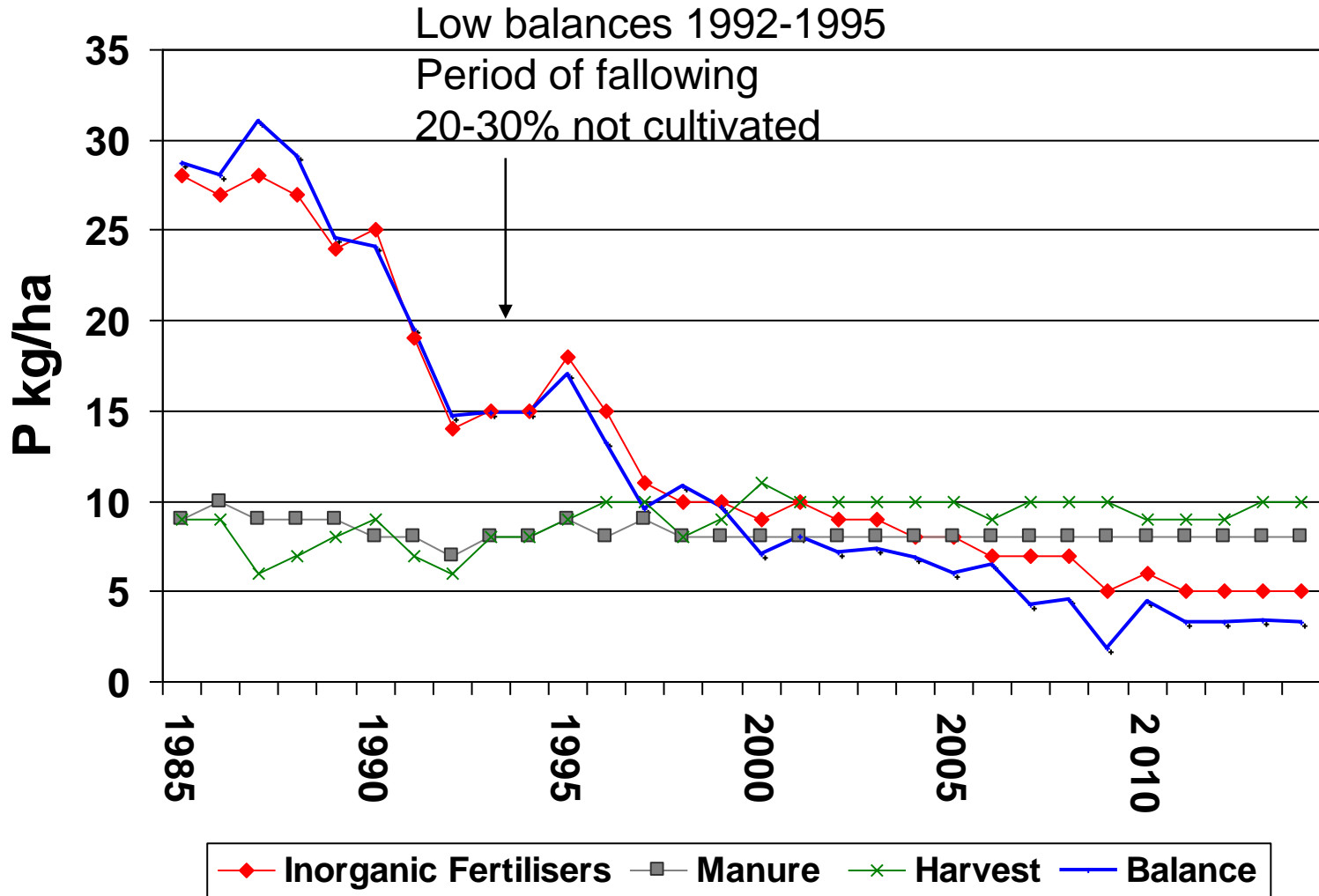
Summary

- 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 what balances mean and how to utilize them in fertilization plans
- More comparison values needed
- Harmonization of methods
- Balances are affected by uncontrolled factors

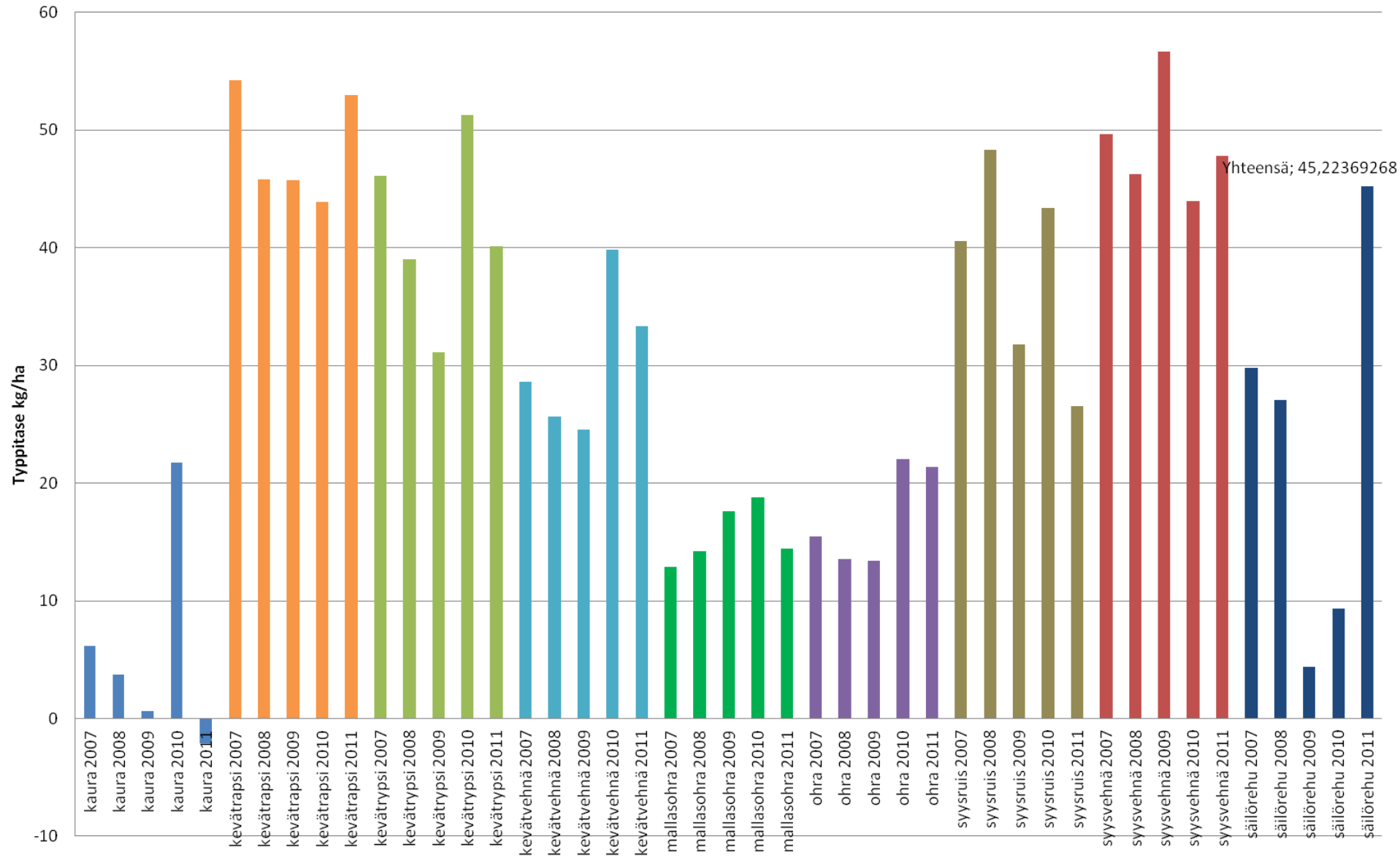
National nitrogen balance for total utilised agricultural area



National phosphorus balance for total utilised agricultural area



Viljelykasvien keskiarvotaseita



Nitrogen balances

