STATUS OF NUTRIENT ACCOUNTING AND BOOKKEEPING IN ESTONIA

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Legal Background (1)

The main legal act in Estonia which implements the Nitrates Directive and HELCOM Recommendations is Water Act

- sets down rules concerning the use of fertilizers
  - ✓ maximum amounts of usage for manure nitrogen (170 kg/N/ha) and phosphorus (25 kg/P/ha)
  - ✓ within NVZ 170 kg/N/ha manure+mineral totally
- requirement for nutrient bookkeeping in the field record book

Legal Background (2)

Farmer must record in the field book (among the other data):

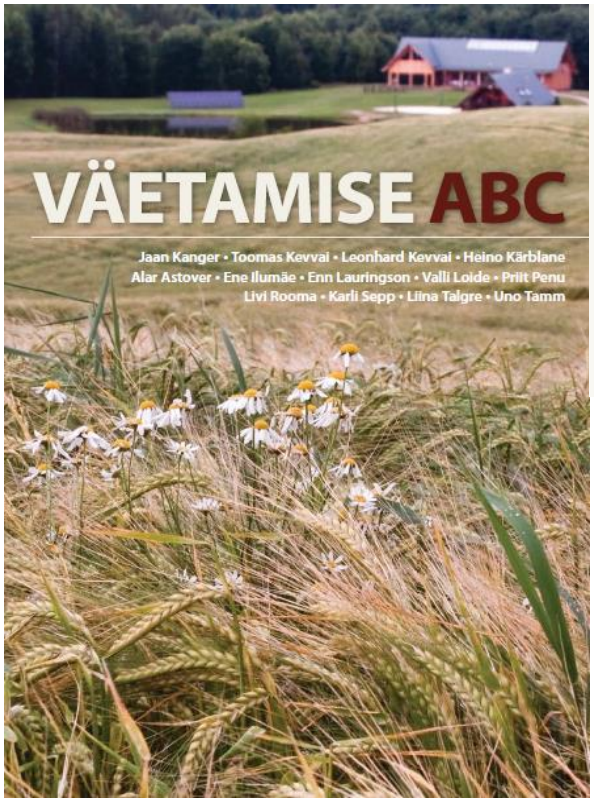
- date; work type; area(ha); type and name of fertilizer; amount and unit of fertilizer; nutrients N kg/ha; P kg/ha; K kg/ha)
- data must be kept for 10 years
- transferred to a new owner (if the land is sold or rented)

13. PÕLLUL TEHTUD TÖÖD JA KASUTATUD MATERJALID

Kuupäev	Töö nimetus	Töö tegija	Pindala ha	Materjali liik	Materjali nimetus	Kogus ja ühik	N kg/ha	P kg/ha	K kg/ha	Märkused
13.1	13.2	13.3	13.4	13.5	13.6	13.7	13.8	13.9	13.10	13.11

Additional voluntary measure (1)

Farmers, who applying for the environmentally friendly management scheme under the Rural Development Plan, should make a fertilization plan.



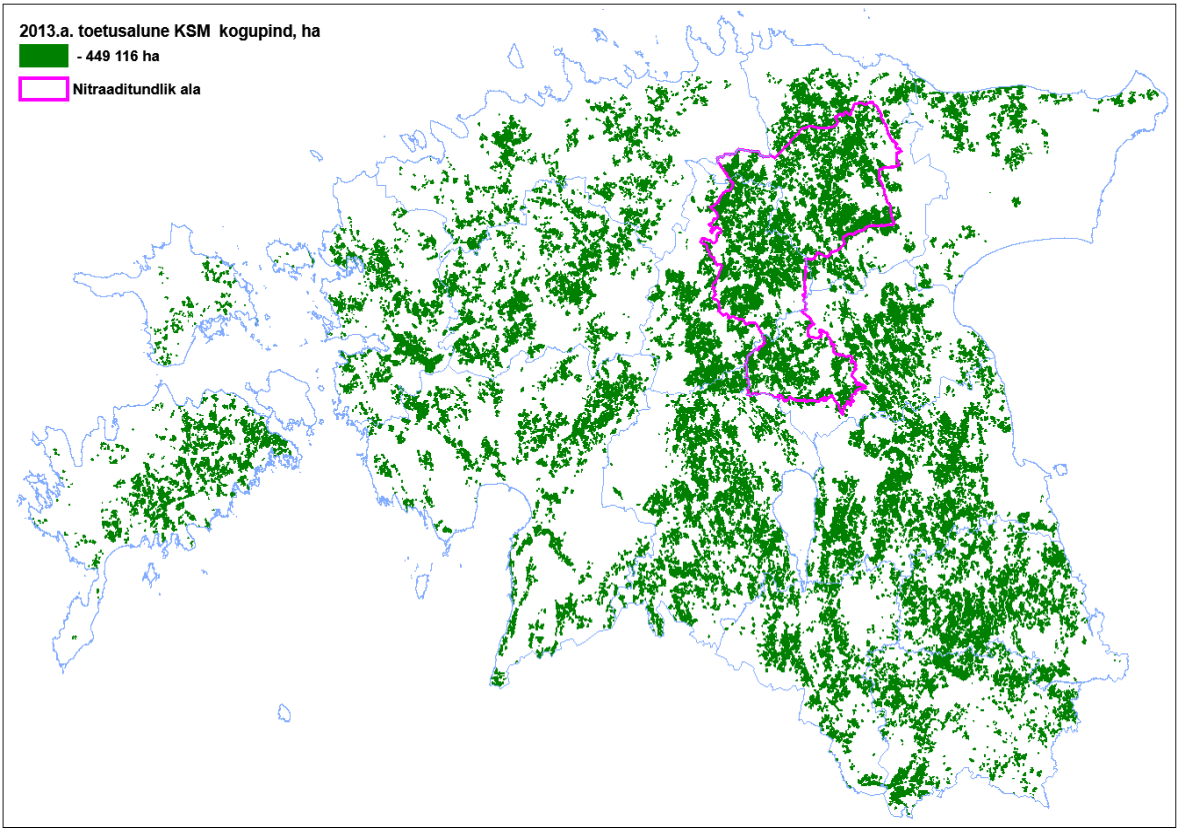
LISA 2. Väetamisplaan

Põllu nr	Taimetoiteelementide norm, kg/ha			Täpsustatud taimetoiteelementide normid kg/ha			Sõn-nik, t/ha	Sõnnikuga antavad taimetoiteelemendid kg/ha			Mineraalväetistega katta taimetoiteelemente kg/ha		
	N	P	K	N	P	K		N	P	K	N	P	K
1	2	3	4	5	6	7	8	9	10	11	12	13	14

Väetise liik, annus						Taimetoiteelemente järgmiseks aastaks kg/ha		Kulud, euro	
Väetis	kg/ha	N	P	K	kg/ põllule	P	K	euro/ha	kokku
15	16	17	18	19	20	21	22	23	24

Additional voluntary measure (2)

Field book and fertilization plan are controlled by the inspectors of the Estonian Environment Inspectorate and ARIB.



- Total area under environmentally friendly management scheme (~46% from Single Payment Area)

Nutrient balance calculation (1)

- The farmers are not officially obliged to account the balance of nutritional elements
- Some advanced farmers are practising it
- One result of the Baltic Deal project was development of the planning tool “MS Excel based farm gate nutrient balance calculation spreadsheet application” (2013)
- ✓ Application is not widely used; after the end of the project this was not supported by the extension service.

Nutrient balance calculation (2)

- Gross nutrient budgets (or balances) are calculated at the national level by the Statistics Estonia
- ES started calculation of nitrogen and phosphorus balance since 2011 (retroactively to 2004)
- Balances are compiled using the OECD and Eurostat methodology

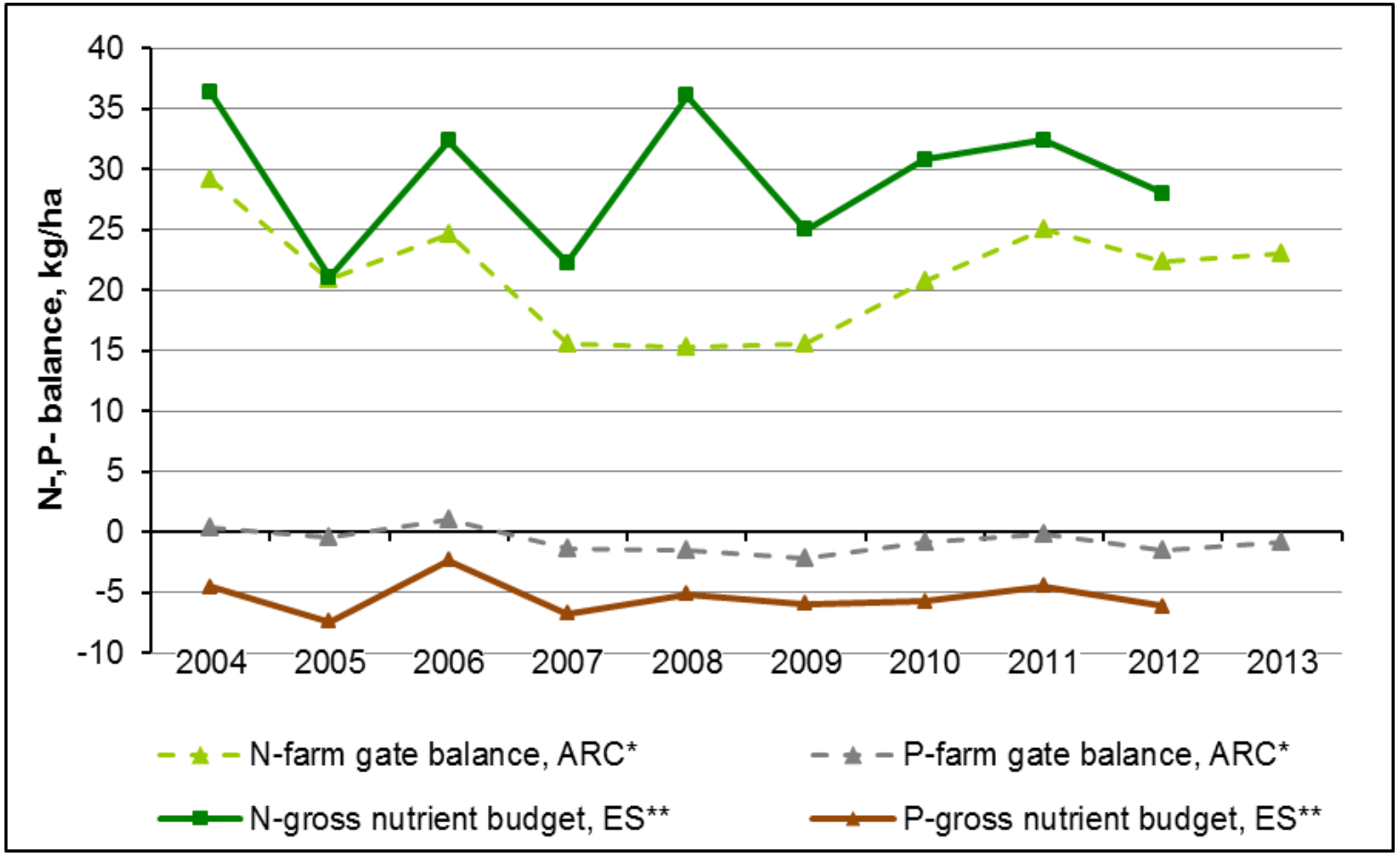
Nutrient balance calculation (3)

- The Gross Nutrient Budget is calculated as total nitrogen/phosphorus input minus total nitrogen/phosphorus output
- Total input: (a) inorganic fertilisers; (b) livestock manure production; (c) biological nitrogen fixation, (d) atmospheric deposition of nitrogen, (e) other inputs (seeds and planting material).
- Total output: (a) total harvested crops, (b) total fodder crops (plants harvested green; temporary grasses and grazing consumption; total of permanent grassland consumption, (c) crop residues removed from the field or grazed.

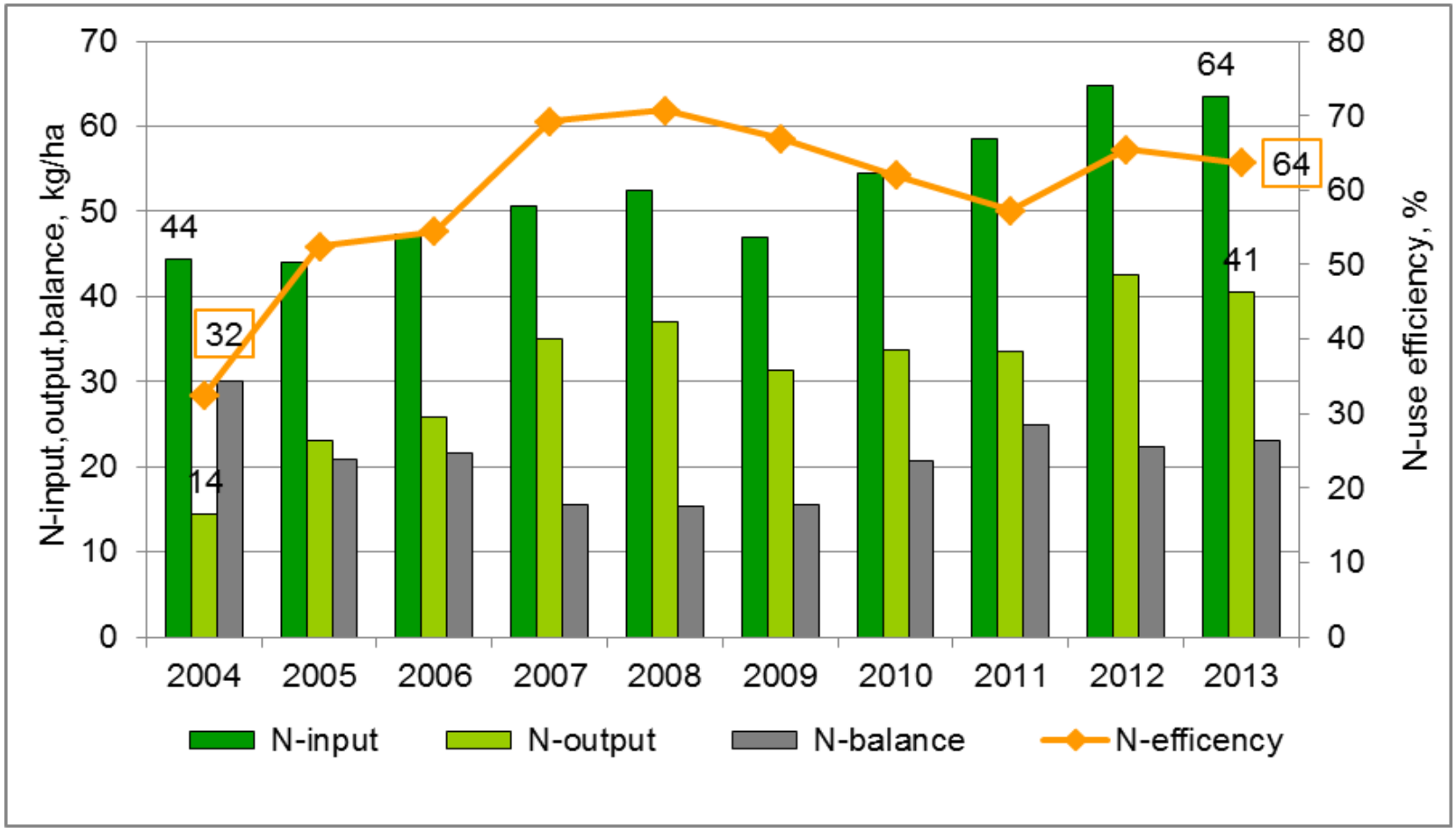
Nutrient balance calculation (4)

- For the monitoring and evaluation of the impact of the Rural Development Plan agri-environmental measures the Estonian Agricultural Research Centre has carried out annual farm gate nutrient balance (NPK) studies since 2004.
- Balances are compiled using the Farm Gate Balance methodology
- The balance equals bought or brought NPK minus sold or removed NPK:
  - Input: feed, straw, mineral and organic fertilizers, seeds, livestock, nitrogen fixation by leguminous crops and atmospheric deposition of nitrogen.
  - Output: plant and livestock production, animals, organic fertilizer (manure), feed and straw.

Nitrogen and phosphorus farm gate balance and gross nutrient budget in agricultural land by the elements



Farm gate nitrogen balance, input, output and efficiency in the period 2004-2013 by ARC



The main problems in both calculating methods

- insufficient data about production and consumption quantity;
- there is no exact overview what is the share of different species of legumes in the grasslands; application of correct N fixation coefficients; N fixation possess great impact for specific agricultural systems;
- to get a more precise overview, the data about the biomass of the collected grass fodder need to be differentiated and specified (hay, silage, green fodder, the proportion of legumes);
- to take into account amounts of all organic fertilizers; content of nutrients varies due to the big heterogeneity of different organic matters.
- because of the missing data, the use of straw has been left out in the gross budget calculation.

Future development

- Within the national program "Applied Agricultural Research and Development 2009-2014", the first version of the Humus Calculator was issued in March 2015
- Starting from the next year, Ministry of the Agriculture is planning within the framework of the program “Applied Agricultural Research and Development in the years 2015-2021” to order the advanced version of the Humus Calculator and web-based Plant Nutrient Balance Calculator
- ✓ According to the application rules, possible contractors must carry out preliminary analysis, provide vision of the project scope and outcome during this year

Thanks for your attention...

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