

Policy recommendations to improve the sustainability of manure and nutrient management in the Baltic Sea Region

Nutrient-efficient agriculture in the Baltic Sea Region
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SuMaNu policy recommendations

- #1 Development of coherent P fertilization policies in the Baltic Sea Region
- #2 Fertilization planning and nutrient balancing
- #3 National standards for handling and spreading manure
- #4 Regional nutrient reallocation
- #5 Minimal use of harmful substances and careful manure processing ensure safe recycling of manure nutrients
- #6 Knowledge transfer between farmers, advisors, researchers, authorities and policymakers

#1 Development of coherent P fertilization policies in the Baltic Sea Region (1/2)

SuMaNu recommendation

- Set a regulatory maximum limit for P fertilization
 - **Minimum demand:** Flat-rate, if stricter P regulation do not exist (e.g., HELCOM limit of $25 \text{ kg ha}^{-1} \text{ yr}^{-1}$ for manure P)
 - **Optimally:** P limits based on crop need and applied for all P fertilizers
- Develop and update national guidelines for N and P application rates. They should account for:
 - Crop N and P need
 - Soil characteristics, especially soil P status
 - Cultivation history
 - Economy

#1 Development of coherent P fertilization policies in the Baltic Sea Region (2/2)

Current status in the BSR

- Most countries in the BSR are lacking regulation for P fertilization
- HELCOM's annual flat rate limit for manure P is not adopted in many countries
- Status and basis of national fertilization guidelines vary among the BSR countries
- Manure is most often spread according to its N content leading to overfertilization of P



Photo: Sentinel Hub EO Browser/ESA Archive/Landsat 5

Regulatory fertilization limits need to be set and fertilization guidelines developed for field level fertilization planning

#2 Fertilization planning and nutrient balancing (1/3)

SuMaNu recommendation

Fertilization planning

- All farms (esp. livestock farms) in the BSR should plan their N and P fertilization annually at the field level based on

... national guidelines and manure nutrient content

... regular soil nutrient content determination

Manure first!

Keep record!



Photo: Erkki Oksanen, Luke

#2 Fertilization planning and nutrient balancing (2/3)

SuMaNu recommendation

Nutrient balancing

- Annual farm-level nutrient balance calculation
 - What is the nutrient use efficiency on the farm?
 - Are there needs to optimize nutrient use efficiency on the farm?
- National reference values should be created for various farm types



If nutrient surplus exist, part of the manure need to be reallocated to the another farm or region to substitute mineral fertilizer use.

#2 Fertilization planning and nutrient balancing (3/3)

Example of SuMaNu's role:

- Fertilization planning will be implemented in Latvia through new CAP
 - So far, fertilization planning has been mandatory only for farms in nitrate vulnerable zones.
 - As a result of different actions (Manure Standards, GreenAgri, SuMaNu etc.) it is decided to develop common fertilization planning reporting system, which is mandatory for all Latvian farmers.



#3 National standards for handling and spreading manure (1/2)

SuMaNu recommendation

- **National manure standards:**
 - Develop and update national standards for determining manure quantity and nutrient content for all livestock and manure types
- **Spreading:**
 - Primarily in the spring and summer for growing crops
 - Autumn spreading only for establishing winter crops
 - According to the manure nutrient content and fertilization plan

→ Increase the minimum requirements for manure storage capacity
- **Technologies:**
 - Raise the requirements for acceptable practices and technologies for animal housing, manure storage and manure spreading
 - Establish a list of best sustainable manure management technologies and practices

#3 National standards for handling and spreading manure (2/2)

Current status in the BSR:

- Inefficient practices and technologies are still often used, e.g.
 - Late autumn and winter spreading due to e.g.,
 - inadequate manure storage capacity
 - lack of suitable time slots for spreading in spring and summer
 - Broadcast spreading

Example of SuMaNu's role:

- Promotion of more advanced manure spreading technologies to replace broadcast spreading (e.g. in Latvia)



#4 Regional nutrient reallocation (1/2)

SuMaNu recommendation

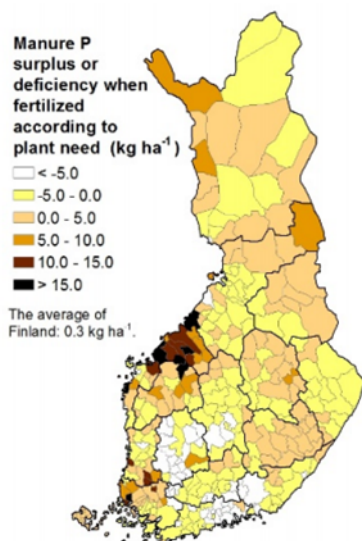
- Reallocate P from the areas of P surplus to the areas in need of P
 - Determine the quantities and characteristics of nutrient-rich biomasses and crop nutrient need regionally
 - Develop a national strategy for nutrient recycling
 - Renewable energy possibilities
 - Base the nutrient reallocation on regional crop nutrient need
 - Support both the production and use of recycled fertilizer products to create a market for the products
 - Demonstrate and raise awareness

#4 Regional nutrient reallocation (2/2)

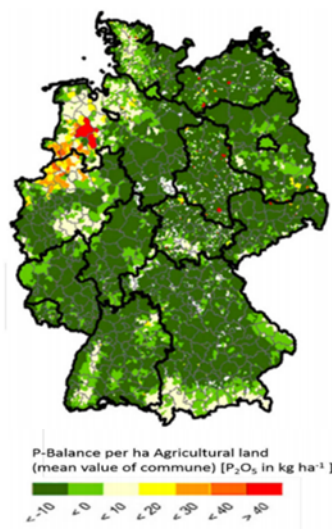
Table 1. EU nutrient recycling potential, total amounts and average amounts per year on agricultural land in the EU if spread evenly (Eurostat 2016, Leip et al. 2014, Velthof et al. 2015, van Dijk et al. 2016, Sutton et al. 2011, Buckwell & Nadau 2016). For comparison, annual mineral fertilizer use (Eurostat 2016).

	N total Mt	N average kg/ha/a	P total Mt	P average kg/ha/a
Manure	7–9	41–52	1.8	10.5
Biowaste	0.5–0.7	2.9–4.1	0.1	0.6
Slaughterhouse waste	ND	ND	0.3	1.7
Sewage	2.3–3.1	13.3–18.0	0.3	1.7
Mineral fertilizer	10.9	63	1.4	8.1

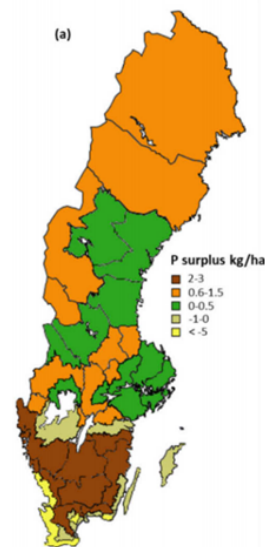
ND = no data



Finland



Germany



Sweden

Luostarinen et al. 2020. <http://urn.fi/URN:ISBN:978-952-380-037-3>

#5 Minimal use of harmful substances and careful manure processing ensure safe recycling of manure nutrients (1/2)

SuMaNu recommendation

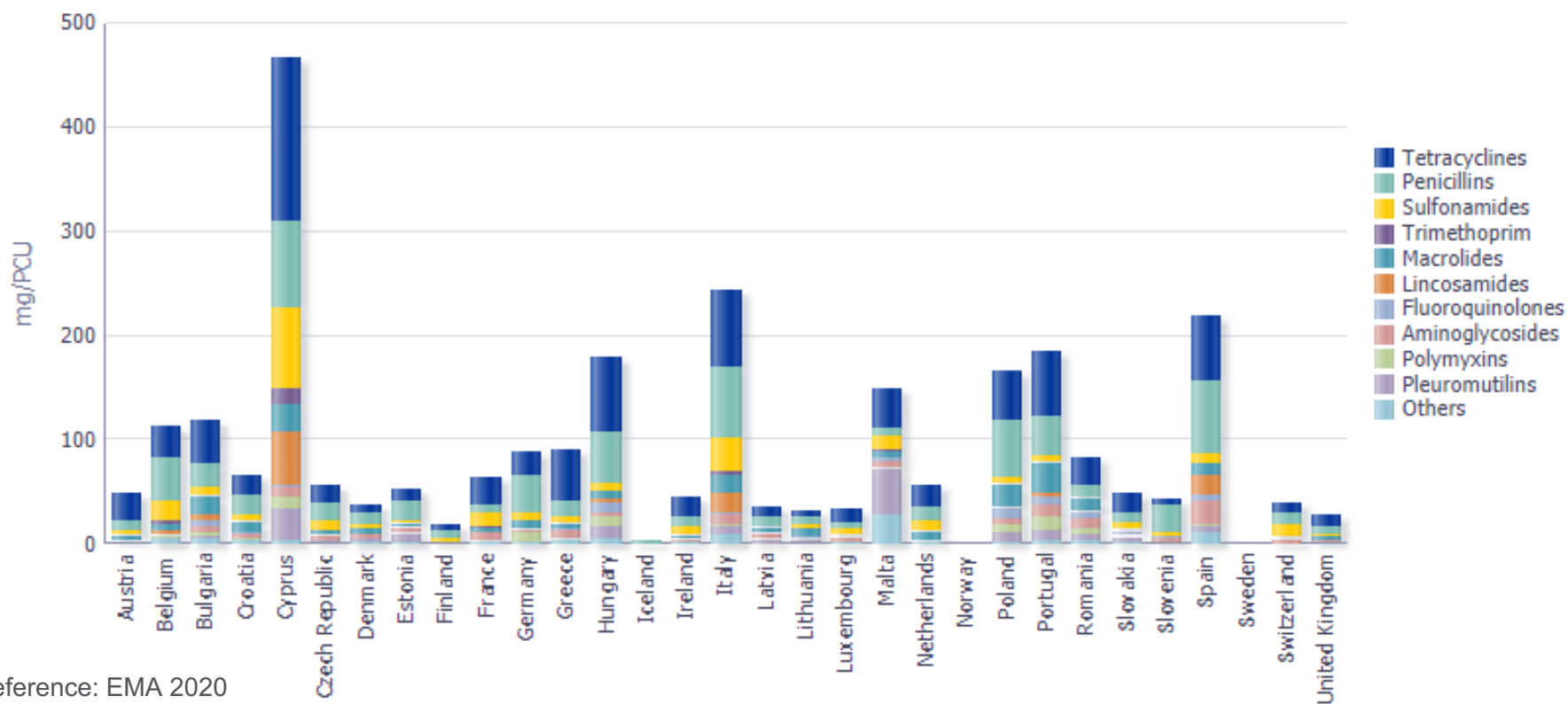
- Use antibiotics and other pharmaceuticals only when necessary
→ animal rearing conditions
- Avoid excess use of trace elements
 - use according to nutritional needs
- Secure the hygienic quality of manure and manure based fertilizer products
- Avoid co-processing with sewage sludge



#5 Minimal use of harmful substances and careful manure processing ensure safe recycling of manure nutrients (2/2)

Current status in the EU

2018



Reference: EMA 2020

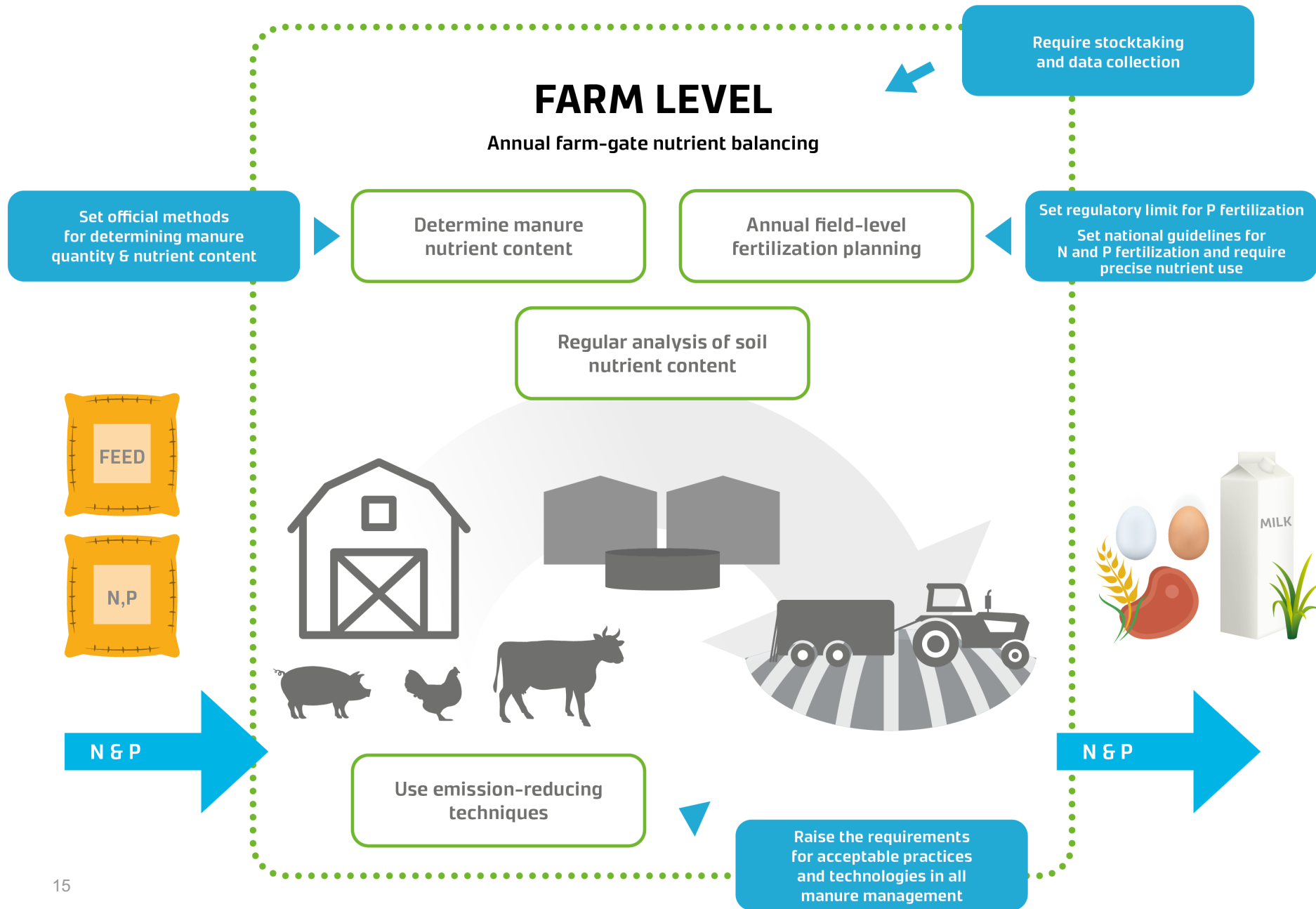
<https://bi.ema.europa.eu/analytics/saw.dll?Dashboard>

#6 Knowledge transfer between farmers, advisors, researchers, authorities and policymakers

SuMaNu recommendation

- Form national manure committees
 - To advice on manure legislation, knowledge transfer policies and research (national & international level)
- Build national manure knowledge transfer systems
 - To support implementation of recommended manure management techniques and practices
- Support cooperation between farmers, advisors, scientists, policymakers
 - Clear messages and holistic approach
 - End-user involvement in projects
 - Utilize digital solutions
- Enhance use of farming data to support nutrient management





FARM LEVEL



N & P

REGIONAL LEVEL

If surplus of manure nutrients to farm need

Reallocate surplus of manure nutrients to neighboring farms

N & P

Reallocate surplus of nutrients to manure processing producing recycled fertilizing products

If regional surplus of manure nutrients

Take account of national and regional supply of manure nutrients and compare to fertilization need to set targets for nutrient recycling



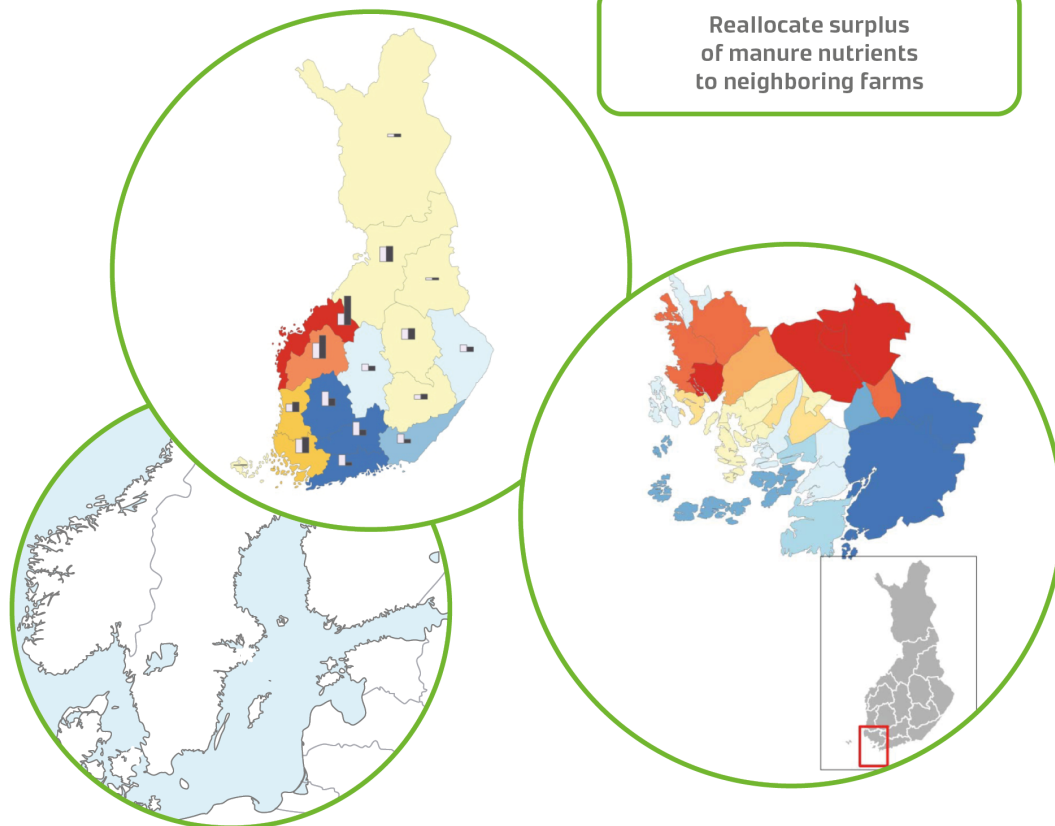
Support production of recycled manure-based fertilizer products



Support use of recycled manure-based fertilizer products



Ensure safety of recycled manure-based fertilizer products



An aerial photograph of a rural landscape. In the center, a farm complex with several red and white buildings and solar panels is surrounded by green fields. To the left, a large field is divided into a grid of small plots. The background features a large body of water under a clear sky.

Thank you!

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