



Knowledge grows

TraP brings solutions to targets set to the Baltic Sea and water protection in agriculture

TraP closing seminar 23.11.2010 Nurmijärvi / Liisa Pietola

Phosphorus challenges: erosion and manure

- **Crops need phosphorus** – but the sea doesn't
- **Phosphorus is leaking from agricultural soils to waters**
 - **Via "hot spots"**
 - **Turbid runoff** of particle-bound soil phosphorus
 - **Manure phosphorus** : organic material decreases adsorption of soil particles
 - Soils with high concentrations of water soluble or plant available phosphorus



TraP tested promising laboratory results on farm

Research project TraP 2007-2010 on

- " Novel gypsum-based products for farm scale phosphorus trapping"



- Yara-Tekes (Finnish Funding Agency for Technology and Innovation)- project

● Partners

- **SYKE** Finnish Environment Institute, **MTT** Agrifood Research Finland, **TTS** Work Efficiency Institute, **Luode** Consulting Ltd, **VHSVY** Water Protection Association of The River Vantaa and Helsinki region, 20 farmers
- TEHO-procet, since 2010 University of Helsinki, South-Western Environmental Agency/ Baltic Sea Action Summit, SLU Swedish University of Agricultural Sciences

TraP -solutions

1. Field gypsum

- 4 tons per hectare each 3-4 year

2. Manure gypsum

- 4 kg per slurry ton, mixed into tank incl. MgO



Gypsum = $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$
Siilijärvi gypsum in tests

– Targets

- Keep phosphorus in fields for crop use
 1. Minimize runoff turbidity and dissolved phosphorus leaching
 2. Improve manure phosphorus use
- Apply solutions into normal farming without changes in land use or profitability

Results: TraP reveled clear effects

- ❖ Field gypsum decreases phosphorus load to waters by 60%
 - Well applicable on erosion sensitive clays around the Baltic Sea
 - Lasts 3-4 years
 - Does not affect crop yield or soil test values
 - Due to increased sulfate losses, the method is not recommended for lake catchments
- ❖ Manure gypsum settles 70-90% of slurry phosphorus to the solids
 - Reduces transportation costs around 0.5 € per slurry ton

Solutions well performed on farms

- ❖ Field gypsum is spreadable by moist lime spreaders
 - Covering of pile is recommended during prolonged storage on farms
- ❖ Manure gypsum works well for cattle slurries with farm machinery
 - Solutions available also for more challenging pig slurry



Results reach EU's reduction targets

- ❖ Level of phosphorus abatement is determined by the society's willingness,
 - i.e. the damage from eutrophication
- ❖ Gypsum significantly reduced more total P load than direct sowing or winter stubble or buffer zones
 - Gypsum has potential to meet reduction target set to the Archipelago Sea
 - = 120 tons a year
 - Without remarkable land use changes
- ❖ According to EU's strategy for the Baltic Sea region best practices in agriculture should be put into effect without reducing the productivity or competitiveness of farming
 - **TraP- solutions are in line with the EU-strategy for the Baltic Sea**