

Roadmap towards deletion of HELCOM hotspots in Denmark

Measures against agricultural runoff to the Sound, Kattegat, and the Belt
Sea.

Henrik Butze-Ruhnenstjerne

- ▶ DN boardmember 1981 - 1998
- ▶ CCB boardmember 1998 - 2001
- ▶ CCB vice chairman 2001 - 2016
- ▶ External instructor, Svendborg Technical College 1995 - now
- ▶ Active authorized organic farmer 1973 - now
- ▶ 45 ha permanent grassland
- ▶ 50 heads of beef cattle

Danish hot spots

- ▶ DK: 5½ million people
 - ▶ DK: 15 million pigs
 - ▶ National dish: Roast pork, heavy gravy and beer
 - ▶ Regulated intensive farming
 - ▶ Organic farming on the rise
 - ▶ Consumers demand
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- ▶ Non-point source agricultural hot spots
 - ▶ Runoff to the Belts and Kattegat from a high density of farming

Danish history of action plans

- ▶ Since 1985:
- ▶ Implementation of a number of action plans to reduce nitrate runoff
- ▶ 1987: APAE I (Action Plan for the Aquatic Environment) adopted by the Danish parliament
- ▶ 1998: APAE II. Implementation of the Nitrates Directive in Denmark - announced by the EU Commission, november 1998. Focus on root zone nitrogen discharges from arable land
- ▶ 2004: APAE III. 2005-2015. Stronger focus on surplus Phosphor which must be halved from 2001/2002 - 2015. Nitrogen reduced by 13% from 2003 - 2015
- ▶ Reduction of the phosphorus surplus in agriculture by 50%. Instruments include a tax on mineral phosphates in feed and intensified research in feed efficiency and treatment of livestock manure.
- ▶ Reduction of phosphorus leaching to water bodies by establishing 10-meter crop-free buffer zones along rivers, streams and lakes, and by restoration of wetlands.
- ▶ Reduction of nitrate leaching by 13% (the result of the previous Action Plans I and II is a reduction by 50%) using set aside, agri-environmental measures, mandatory catch crops and further requirements for the utilization of the nitrogen content in livestock manure.
- ▶ Protection of neighbors, protection zones where framing facilities are not allowed within 50, 100 and 300 meters distances, depending on the number of neighbors and the size of livestock herd.

- ▶ 2008: Midterm evaluation of APAE III. Effect lower than anticipated
- ▶ 2009: Green Growth Agreement. Broader plan to ensure better conditions for nature and environment while allowing agriculture to develop
- ▶ 2016: Nullification of the 10-meter buffer zone.
- ▶ 2017: Test farms: Precision fertilization
- ▶

Controlling Nitrate Runoff Since 1985

- ▶ Since 1985:
- ▶ DN (The Danish Society for the Conservation of Nature) launches a "dead fish" awareness campaign on the aquatic environment
- ▶ Lack of oxygen in the aquatic environment
- ▶ Implementation of a number of action plans to reduce nitrate runoff
- ▶ 1987: APAE I (Action Plan for the Aquatic Environment) adopted by the Danish parliament. National planning.
- ▶ 1998: APAE II. Implementation of the Nitrates Directive in Denmark - announced by the EU Commission, november 1998. Focus on root zone nitrogen discharges from arable land. European planning.

APAE III 2005-2015

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- ▶ Reduction of the phosphorus surplus in agriculture by 50%. Instruments include a tax on mineral phosphates in feed and intensified research in feed efficiency and treatment of livestock manure.
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- ▶ Protection of neighbors, protection zones where farming facilities are not allowed within 50, 100 and 300 meters distances, depending on the number of neighbors and the size of livestock herd.

Green Growth Agreement

- ▶ 2008: Midterm evaluation of APAE III. Effect lower than anticipated
- ▶ 2009: Green Growth Agreement. Broader plan to ensure better conditions for nature and environment while allowing agriculture to develop
- ▶ New farmers' NGO called "Sustainable Farming" advocating for freedom from rules
- ▶ 2016: Nullification of the 10-meter buffer zone. Voluntary measures
- ▶ 2017: Test farms: Precision fertilization, based on drones and AI, with limited surplus to nature
- ▶

Best Practises

- No application of liquid manure from harvest to February 1 or perennial crops to March 1
- No application of solid manure from harvest to October 20 only on fields with winter crops
- Limits to use of silage effluent between harvest and November 1.

Best Practises

Spreading on sloping soils;

- No application in a manner which risks run off into lakes and watercourses
- No application of manure in a 20 m buffer strip along watercourses, lakes and inlets

Best practises

**Soaked, frozen
and snow-
covered soils;**

- No application in a manner which risks run off into lakes and watercourses

Proximity of watercourses

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- 2 meter mandatory buffer zones along watercourses and lakes

Effluent storage works

Effluent storage works;

- Storage restrictions and capacity and quality of manure storage
- Distance to water bodies and nature sites
- Precautions when handling slurry is tightened

Crop rotation, permanent crop maintenance

**Crop rotation,
permanent
crop
maintenance;**

•Crop rotation
plan for all
fields
individually with
nitrogen use

Annual Fertilization plans and spreading records

Fertilization plans and spreading records;

- Annual Fertilizer accounts
- Publication of all Fertilizer accounts
- E.g 60 kg nitrogen per ha, organic grass land

Fertilization Accounts

- ▶ Mandatory for all farms
- ▶ On-line reporting to the Department of Food and Farming by the end of March each year
- ▶ Registration on field level
- ▶ Connected to field maps
- ▶ To minimize fertilizer surplus:
- ▶ Fertilizer limits for individual crops
- ▶ Fertilizer limits for individual soil types
- ▶ Fertilizer limits connected to total no of animal units
- ▶ Fertilizer demands to farming sustainability, organic farming, etc.

Danish farming in Perspective

- ▶ Intensive farming in transition?
- ▶ High tech and precision farming in DK and elsewhere
- ▶ Organic nation by 2050?
- ▶ Back to 10 m buffer zones
- ▶ Environmental & farming best practices
- ▶ International farming cooperations
- ▶ No Danish efficiency without Danish regulations