

# Implementation of the Nitrates Directive in Germany

Dr. Joachim Heidemeier & Dr. Dietrich Schulz

# Good Agricultural Practice: The legal basis

- ▶ EU legislation:
  - ▶ Nitrates Directive
    - ▶ vulnerable zones
    - ▶ good agricultural practice
    - ▶ 170 kg N / ha-a from manure for arable land
  - ▶ Water Framework Directive (WFD)
    - ▶ good status as main objective
    - ▶ RBMP

# Good Agricultural Practice: The legal basis

- ▶ National (German) legislation:
  - ▶ Fertilizer Act
  - ▶ Ordinance on Fertilizer Quality (Düngemittelverordnung)
  - ▶ Ordinance on Fertilizer Application (Düngeverordnung, Latest amendment 2007)
  - ▶ Ordinance on Marketing and Transport of Manure (Verbringungsverordnung, 2010)

# The main problem: livestock manure

Not waste, but a valuable fertilizer!

- ▶ Apply according to site, climate and yield
- ▶ Save as much mineral fertilizer as possible
- ▶ Minimize environmental losses
- ▶ Save energy and greenhouse gases
- ▶ Use for biogas production
  - ▶ take fermentation leftovers as fertilizers
  - ▶ biogas production - input from plants
  - ▶ gap in regulation - leftover not covered by 170 kg/ha

# Animal density

## No direct correlation legally fixed

- ▶ Indirectly by limit values for nutrients/ha
- ▶ book-keeping by manure importing farms
- ▶ Farms with excess manure (exporting farms)
  - ▶ records about their manure exports (where, when, how much)

# Environmental permits

- ▶ Poultry and pigs according to IPPC (40 000 poultry, 2000 pigs, 750 sows including piglets), PRTR-reporting required
- ▶ Cattle: Simplified permit >600 places
- ▶ No permits for sheep, horses etc.

# Construction of manure storage tanks

- ▶ Storage capacity for 6 months
- ▶ Solid or sufficient floating cover (10 cm)
- ▶ Keep chicken manure dry
- ▶ Water tightness according to technical guidance documents DIN 1045 and DIN 11622
- ▶ Agricultural waste water and silage effluents to be collected in the manure tanks
- ▶ Federal regulation for manure and silage tanks in preparation
- ▶ Protection against mechanical impacts

# Application of organic manure

- ▶ No spreading
  - ▶ 1st November - 31st January on arable land
  - ▶ 15th November-31st January on grassland
- ▶ Low emission spreading (negative list of obsolete apparatus) according to generally accepted rules of technique
- ▶ Immediate incorporation into the soil „as soon as possible“ (same day or next morning)
- ▶ No spreading when the soil is frozen, snow covered or water saturated

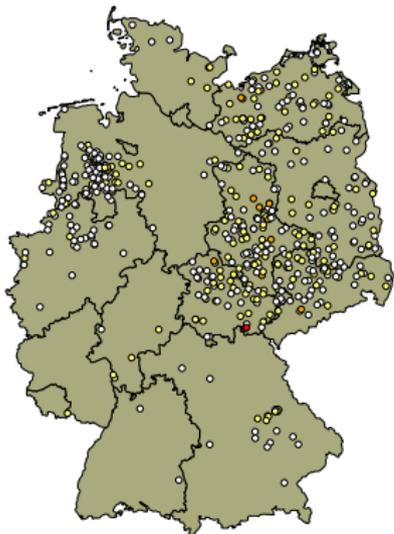
# Application rates for nutrients

- ▶ Limit 170 kg N/ha with manure
- ▶ Exceptions for grassland up to 230 kg N/ha
- ▶ In autumn 80 kg Nt/ha or 40 kg NH<sub>4</sub>-N/ha with manure
- ▶ Estimate or calculate fertilizer need using approved methods
- ▶ Soil analysis for P and K every 6 years
- ▶ Book-keeping on nutrients and balance calculations compulsory

# Surpluses of N and P

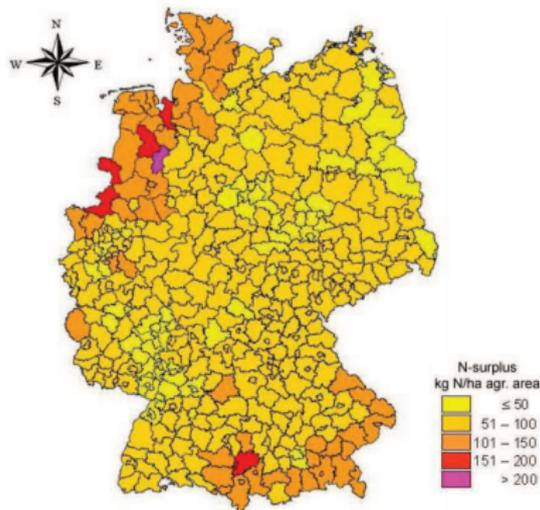
- ▶ Tolerable surpluses for N (3 years average; surface balance) 60 kg N/ha
- ▶ Tolerable surplus for P<sub>205</sub> (6 years average) 20 kg/ha

# Ammonia emissions and N-Surplus in Germany



NH<sub>3</sub> Freisetzungen

- 10-20
- 20-100
- 100-400
- 400-560



- N-surplus  
kg N/ha agr. area
- ≤ 50
  - 51 – 100
  - 101 – 150
  - 151 – 200
  - > 200

# Winter crop cover

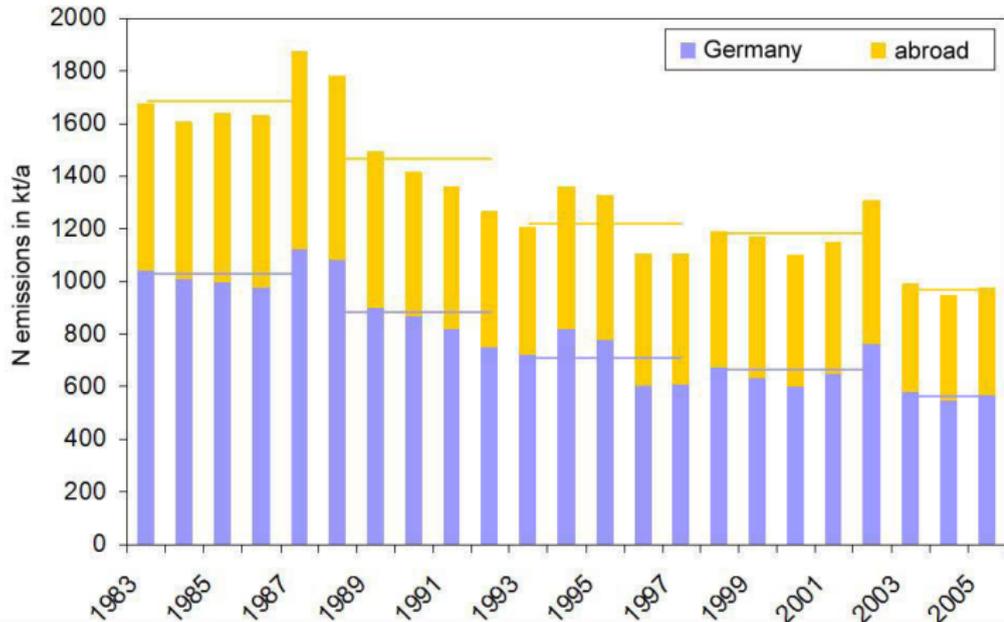
- ▶ Fertilizer application in autumn only to winter crops or straw incorporation
- ▶ Cross compliance: 40% of farmland must be covered with plants or plant residues
- ▶ new Problem: Maize only for biogas-production (storage capacity for fermentation leftovers)

# Water protection measures and nutrient reduction areas

- ▶ Whole Germany is a vulnerable zone.
- ▶ 3 m buffer zones along surface waters. No fertilization (exact apparatus 1 m)
- ▶ On slopes (>10%) incorporation into soil, 10m buffer zone.
- ▶ Extensification and Eco-farming under „second pillar“-programmes (EAFRD) run by the federal states.
- ▶ Voluntary cooperation between farmers and water suppliers (Ex.: Munich, Leipzig, Gelsenwasser etc.)

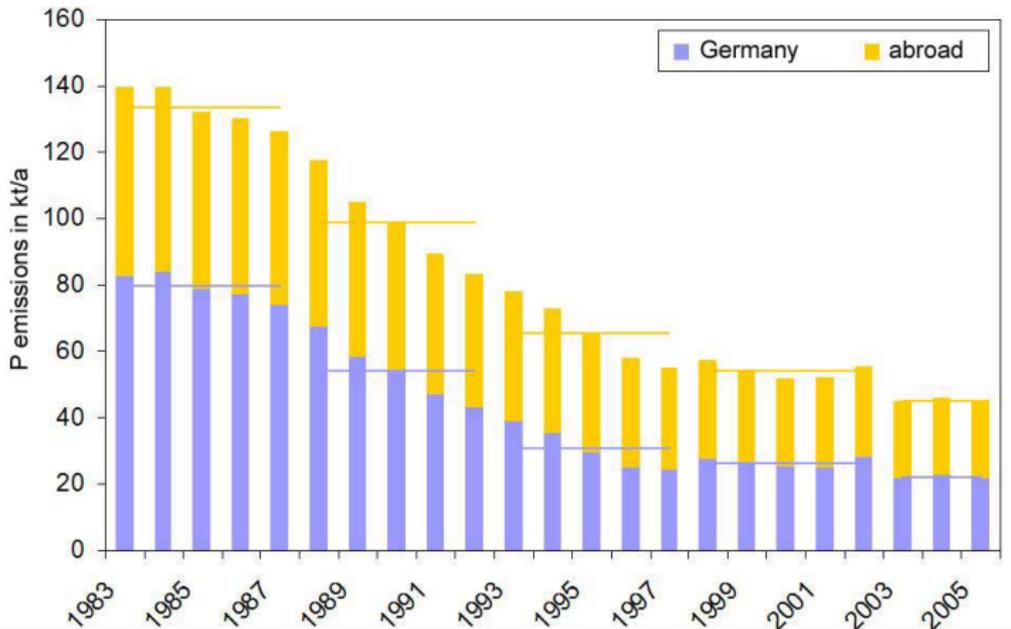
# Progress - but not enough

## Nitrogen

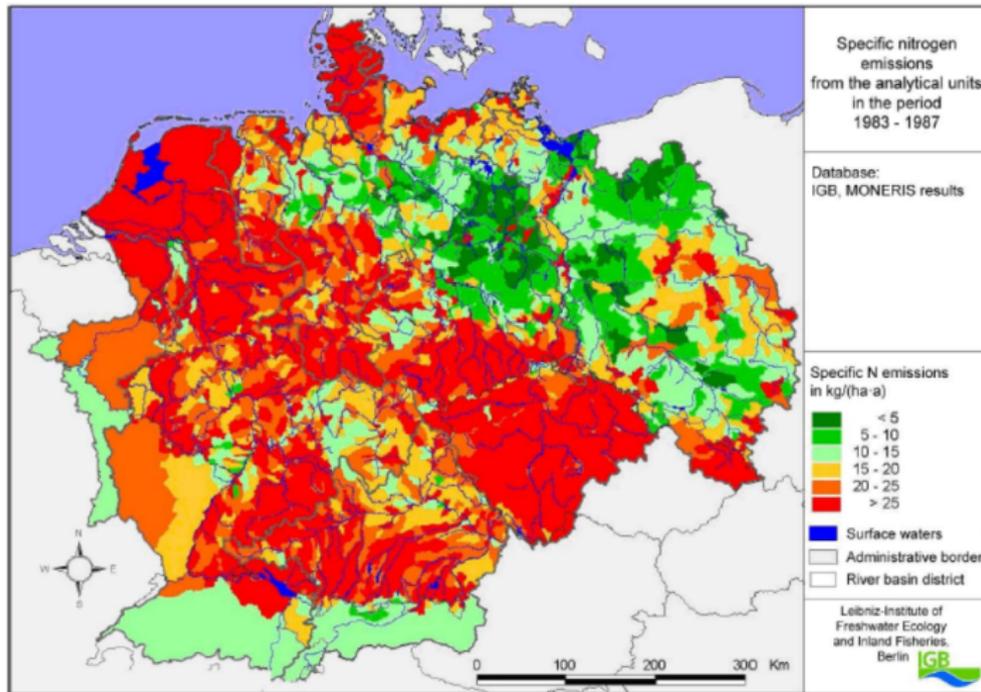


# Progress - but not enough

## Phosphorus

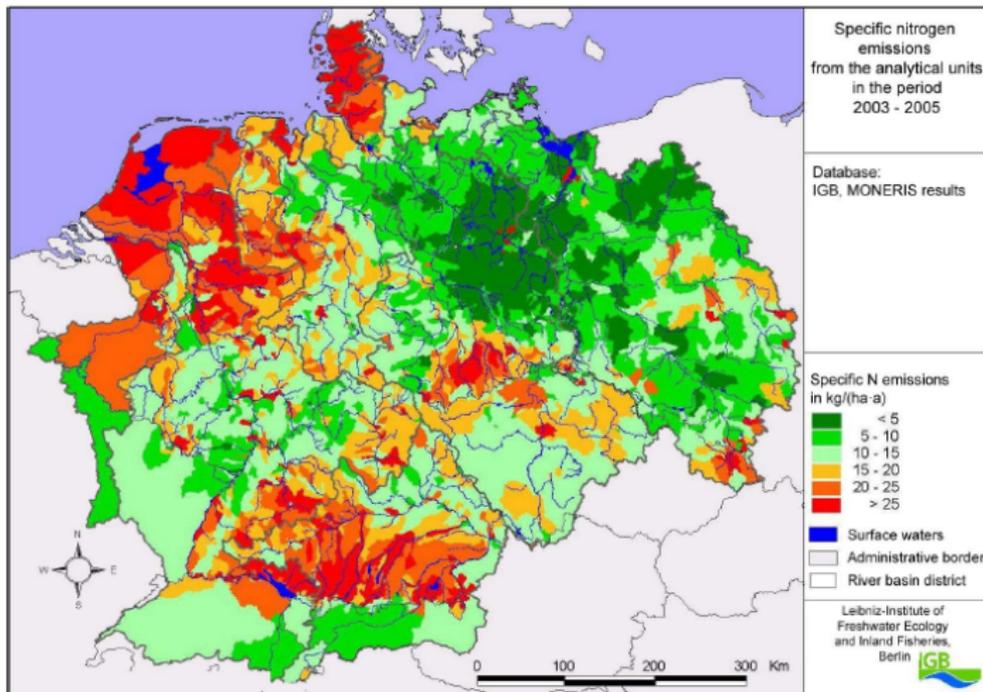


# Progress - but not enough



nitrogen emissions 1985

# Progress - but not enough



nitrogen emissions 2005