

International Workshop:

**“Agriculture and Environment in the Balkans and Turkey:
Networking Regional Experience”**

organized by

European Commission, DG Joint Research Centre
Gembloux Agricultural University, Belgium
Wallonia Business House for EUROPE (AWEX)
Walloon Agricultural Research Centre, Belgium

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Glances at the EC Nitrate Directive implementation in the Walloon Region of Belgium

Prof. Jean Marie MARCOEN

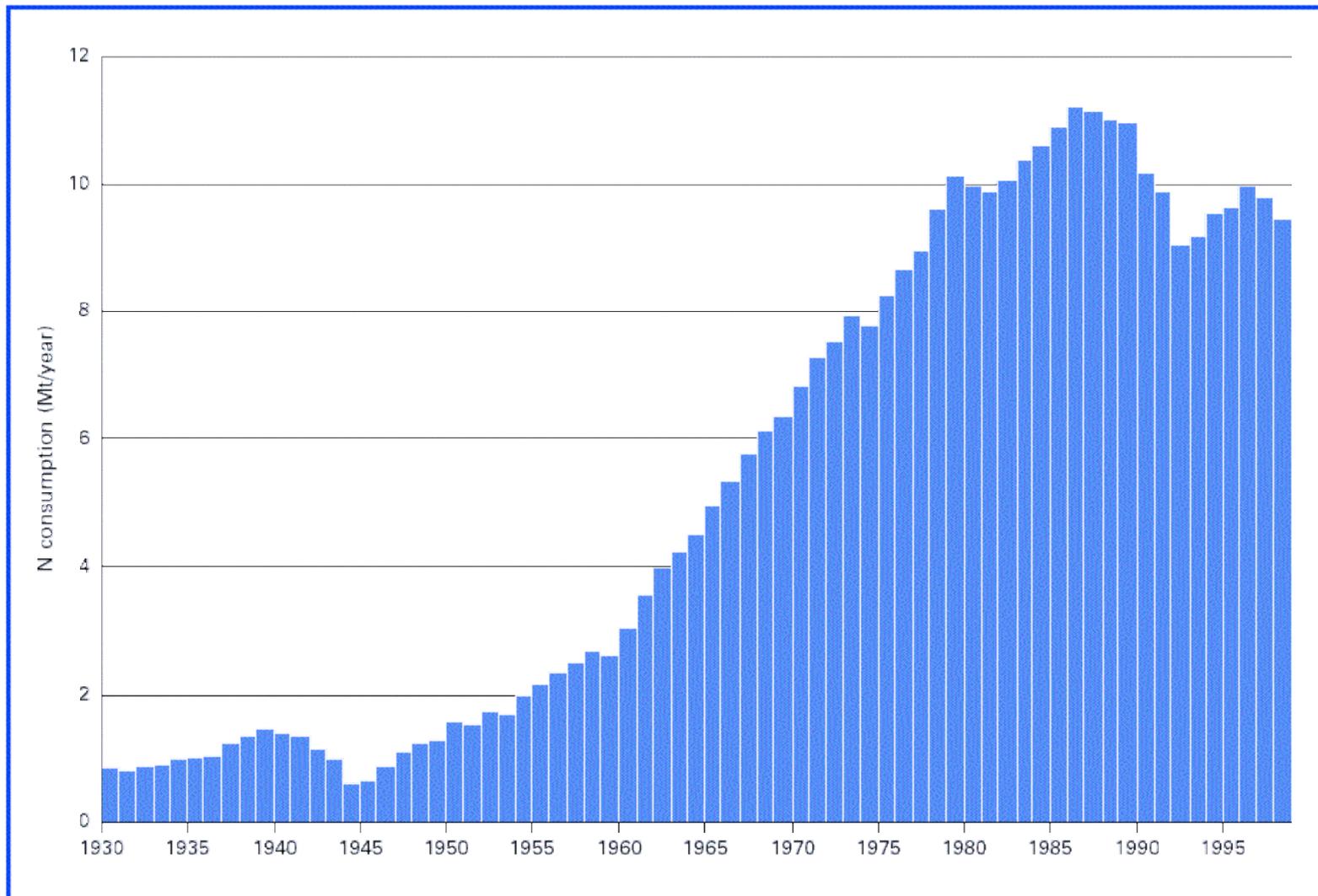
FUSAGx

(Gembloux Agricultural University, Belgium)

&

NITRAWAL

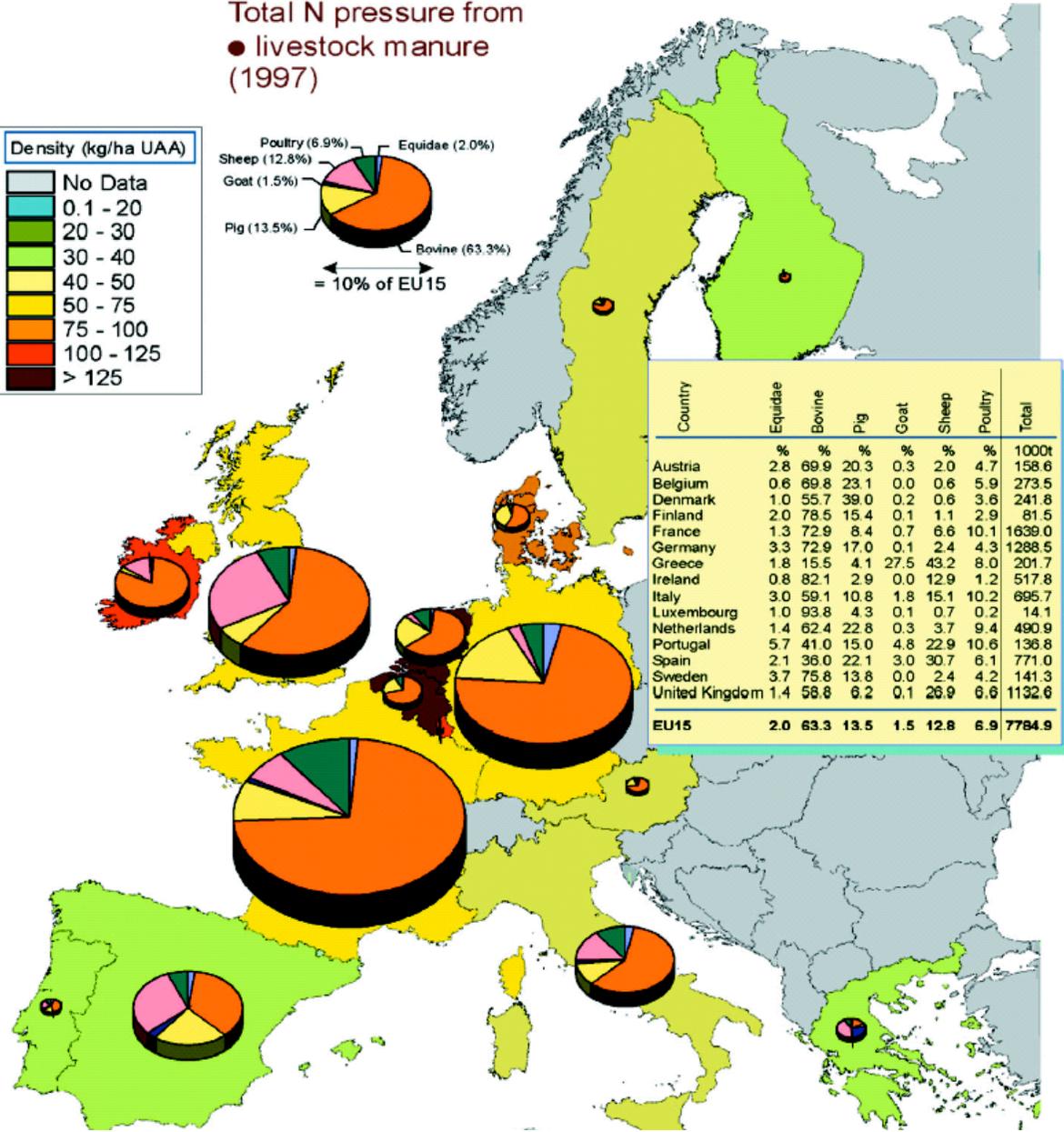
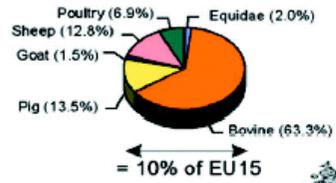
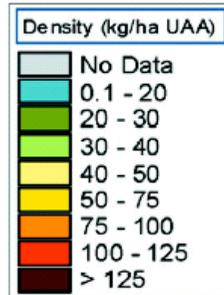
Mineral N fertilisers consumption – E.U. 15 Member states



Source: EFMA (Millions of tons of nitrogen per year).

Nitrogen inputs to EU Agriculturals Soils

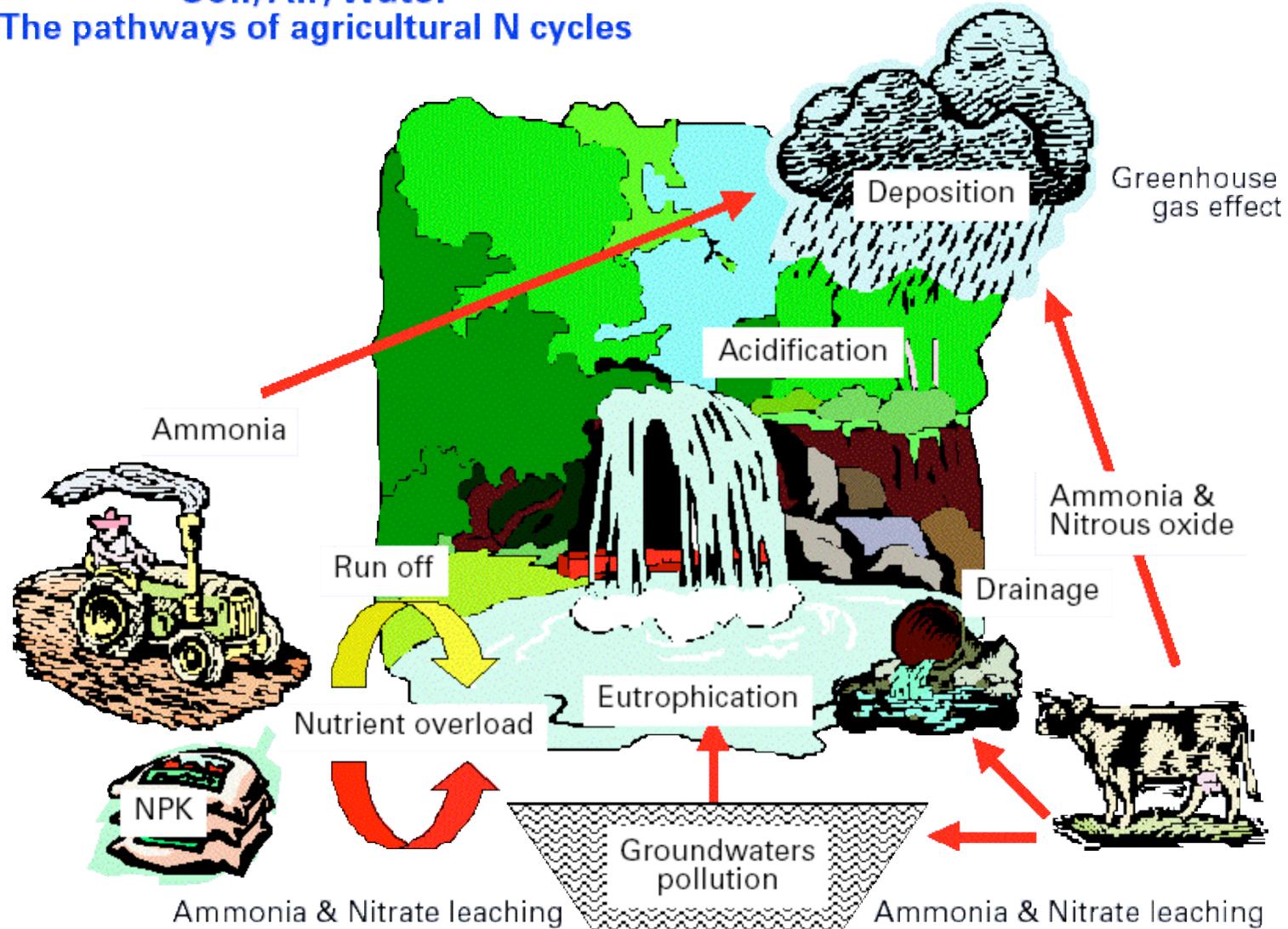
Total N pressure from
● livestock manure
(1997)



Country	Equidae	Bovine	Pig	Goat	Sheep	Poultry	Total
Austria	2.8	69.9	20.3	0.3	2.0	4.7	1000t
Belgium	0.6	69.8	23.1	0.0	0.6	5.9	273.5
Denmark	1.0	55.7	39.0	0.2	0.6	3.6	241.8
Finland	2.0	78.5	15.4	0.1	1.1	2.9	81.5
France	1.3	72.9	8.4	0.7	6.6	10.1	1639.0
Germany	3.3	72.9	17.0	0.1	2.4	4.3	1288.5
Greece	1.8	15.5	4.1	27.5	43.2	8.0	201.7
Ireland	0.8	82.1	2.9	0.0	12.9	1.2	517.8
Italy	3.0	59.1	10.8	1.8	15.1	10.2	695.7
Luxembourg	1.0	93.8	4.3	0.1	0.7	0.2	14.1
Netherlands	1.4	62.4	22.8	0.3	3.7	9.4	490.9
Portugal	5.7	41.0	15.0	4.8	22.9	10.6	136.8
Spain	2.1	36.0	22.1	3.0	30.7	6.1	771.0
Sweden	3.7	75.8	13.8	0.0	2.4	4.2	141.3
United Kingdom	1.4	58.8	6.2	0.1	26.9	6.6	1132.6
EU15	2.0	63.3	13.5	1.5	12.8	6.9	7784.9

Based on DG Env / Eurostat / ERM
/ AB-DLO / JRC CIS

Soil/Air/Water The pathways of agricultural N cycles



Possible impacts :

A part of this nitrogen loss (50-80%) is recycled to water and soils, causing

groundwaters pollution (deterioration of drinking water quality:

concentrations exceed the agreed max value of 50 mg nitrate per litre as set

out in the European Directive),

eutrophication of surface waters in synergy with phosphorus, and

contributing to « acid-rain » damages on terrestrial flora and soils; another

part, up to 20-50%, is « denitrified » into inert nitrogen gas (some N₂O with a

greenhouse gas effect)

According to its Article 1, the **objective of the Nitrate Directive** is to reduce water pollution caused or induced by nitrate from agricultural sources and to prevent any further such pollution.

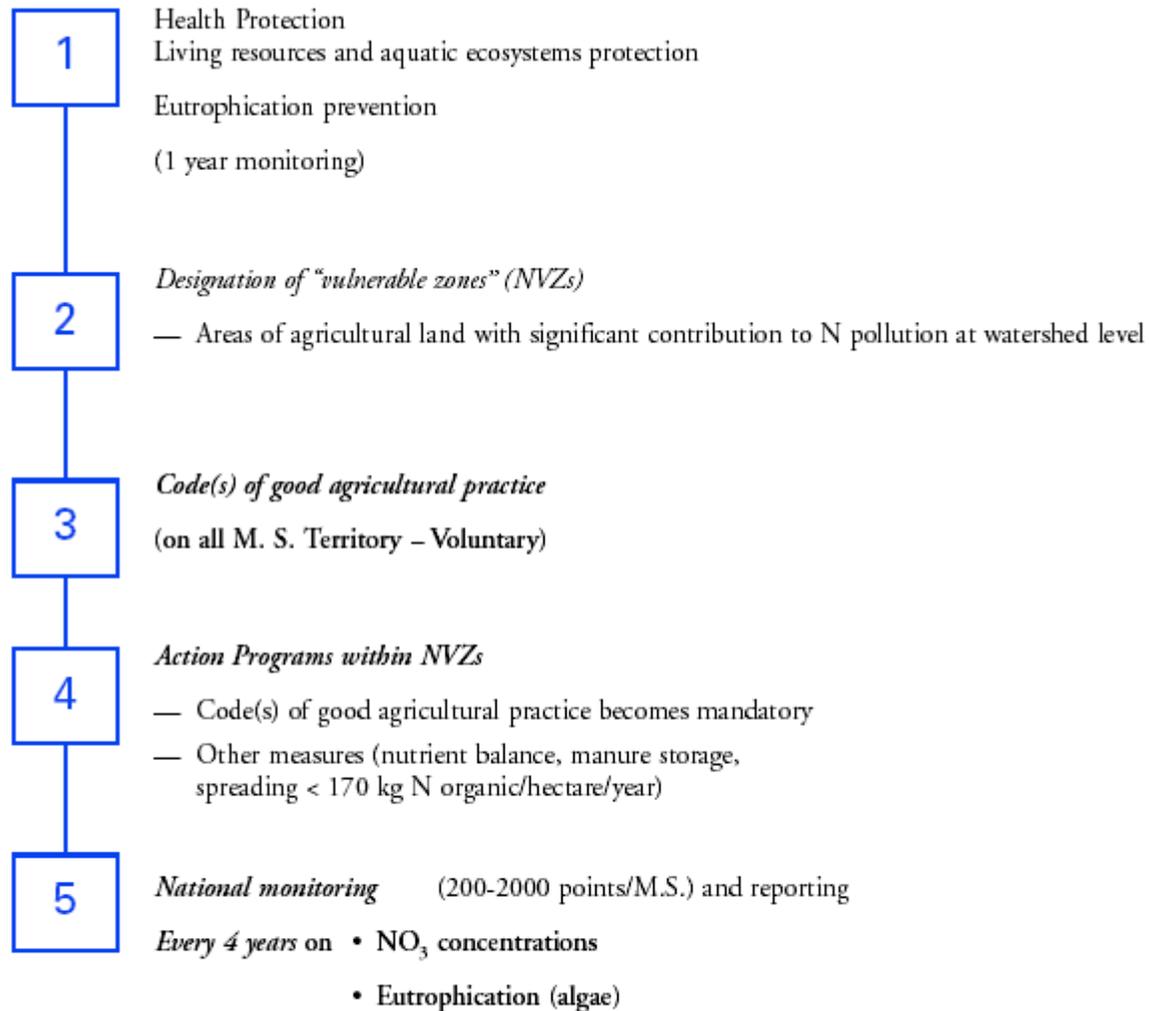
« **pollution** »: means the discharge, directly or indirectly, of nitrogen compounds from agricultural sources into the aquatic environment, the results of which are such as to cause hazards to human health, harm to living resources and to aquatic ecosystems, damage to amenities or interference with other legitimate uses of water’.

Waters affected by pollution and waters which could be affected by pollution if action is not taken shall be identified by the Member States.

Member States shall review and if necessary revise or add to the designation of vulnerable zones as appropriate, and at least every four years, to take into account changes and factors unforeseen at the time of the previous designation.

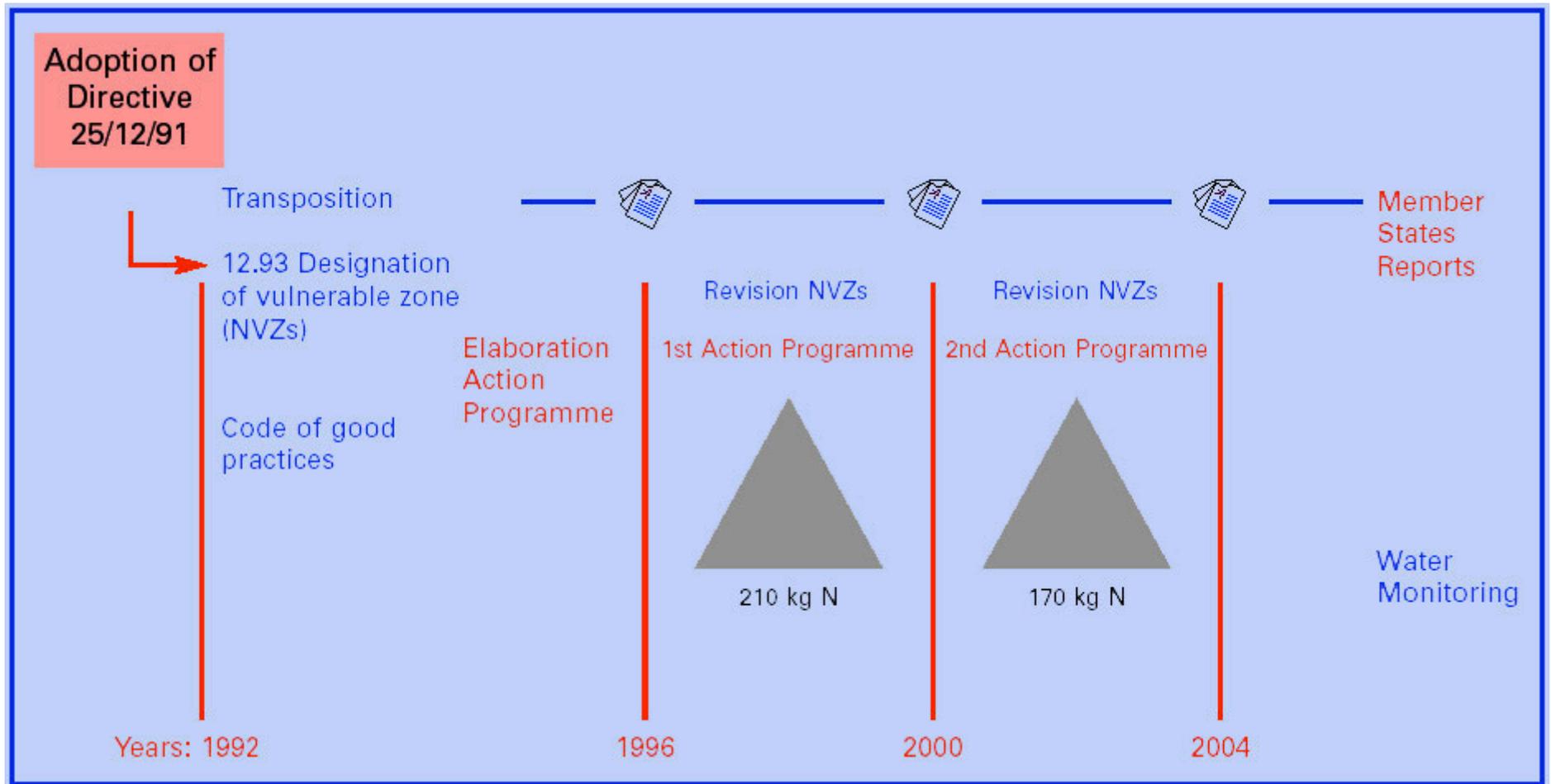
The “Nitrates” Directive “process” consists of 5 steps :

Detection of polluted or threatened waters (N)



- ✦ Assessment of Action Programs impact
- ✦ Revision of NVZs and Action Programs

EU calendar for implementation



Implementation of EC Nitrate Directive in WR

1991	<ul style="list-style-type: none"> • Order of the Walloon Government on conditions of livestock effluents spreading
1992	
1993	
1994	<ul style="list-style-type: none"> • Order of the Walloon Government of 5 May 1994 on the protection of water against nitrate from agricultural sources (Moniteur belge of 28 June 1994) • Code of good agricultural Practices • Désignation of NVZs of Crétacé de Hesbaye and of Bruxellian sands
1995	
1996	
1997	
1998	
1999	
2000	Z.V. du sud-Namurois
2001	
2002	<ul style="list-style-type: none"> • Désignation of NVZs of Comines-Warneton and « Sud Namurois • Programme for Nitrogen Sustainable Management in Agriculture ('Programme de Gestion Durable de l'Azote en agriculture', P.G.D.A.)
2003	
2004	
2005	
2006	Désignation of the Pays de Herve in NVZ

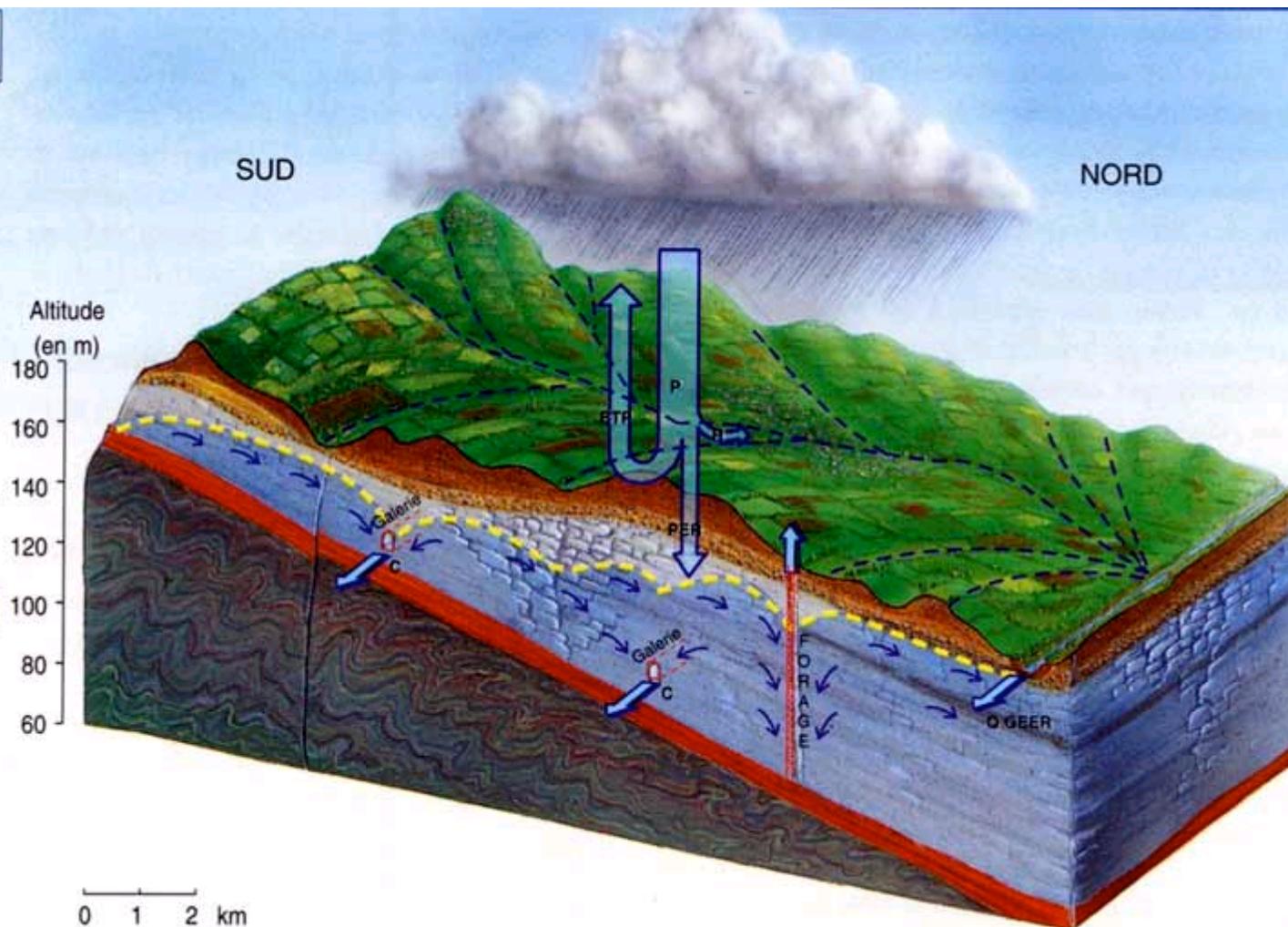
Hydrogeological study : chalk of Hesbaye

LES MOUVEMENTS DE L'EAU

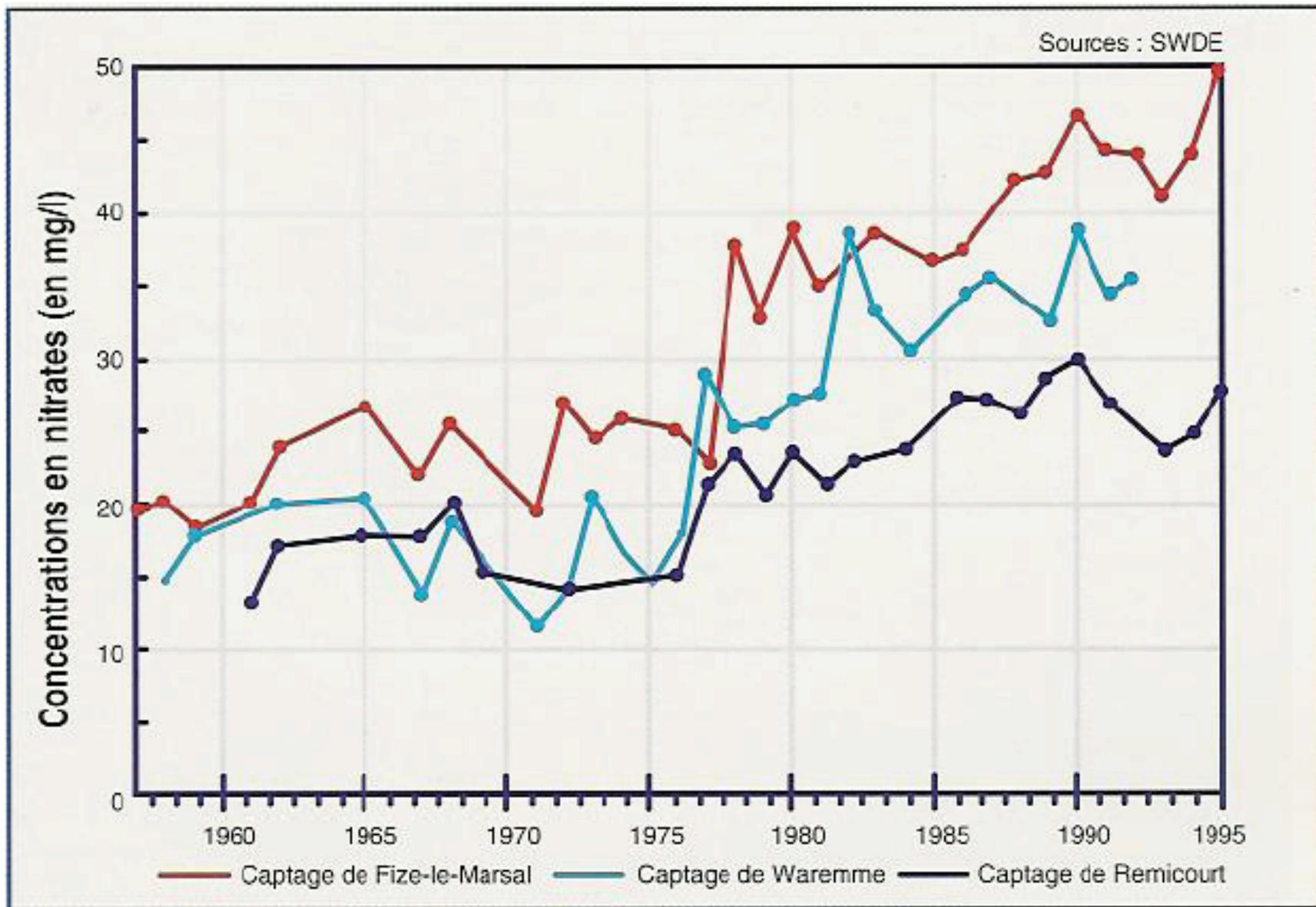
- P : précipitations
- ETP : évapotranspiration
- R : ruissellement
- Per : percolation
- Q Geer : débit total du Geer
- C : débits captés dans la nappe aquifère
-  : ouvrages captants
-  : vallées sèches
-  : niveau de la nappe
-  : sens d'écoulement des eaux souterraines

LA GÉOLOGIE

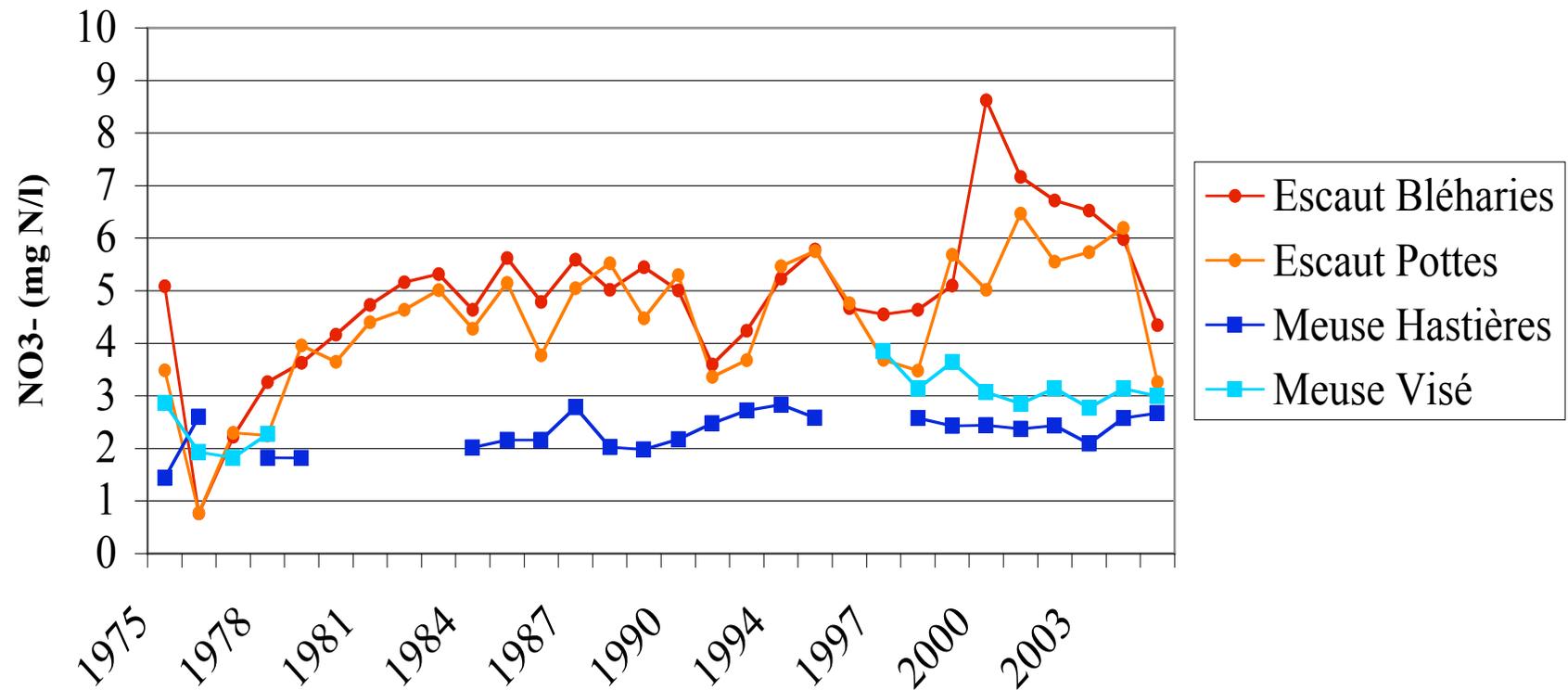
-  : limon
-  : alluvion
-  : sable
-  : conglomérats à silex
-  : craie
-  : hard-ground
-  : smectite
-  : socle primaire
-  : faille
-  : fissure



Source : LGIH (Université de Liège)



Concentrations moyennes annuelles en nitrate



The Programme for Nitrogen Sustainable Management in Agriculture *in WR* :

- the « NITRAWAL » association
- the code of good agricultural practices
- the traceability of effluent exchanges
- the dérogation
- the Agricultural Surface Survey
- the Nitrate Survey

La structure d'encadrement des agriculteurs

Le code de bonnes pratiques agricoles

Le cadastre des épandages

La dérogation

Le survey surfaces agricoles

Le survey nitrate



La structure d'encadrement des agriculteurs
 Le code de bonnes pratiques agricoles
 Le cadastre des épandages
 La dérogation
 Le survey surfaces agricoles
 Le survey nitrate

Spreading conditions

Quick-Acting



	M	J	J	A	S	O	N	D	J	F	M	A
Cropland	✓	✓	⚠	⚠	⚠	✗	✗	✗	✗	✗	✓	✓
Grassland	✓	✓	✓	✓	✗	✗	✗	✓	✓	✓	✓	✓

Slow-Acting



	M	J	J	A	S	O	N	D	J	F	M	A
Cropland	✓	✓	⚠	⚠	⚠	✓	✓	✓	✓	✓	✓	✓
Grassland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

- ✓ épandage autorisé
- ✗ épandage interdit
- ⚠ épandage sous conditions (culture d'hiver, CIPAN, ...)

La structure d'encadrement des agriculteurs
Le code de bonnes pratiques agricoles
Le cadastre des épandages
La dérogation
Le survey surfaces agricoles
Le survey nitrate

Spreading conditions



Manure storage : 6 months



La structure d'encadrement des agriculteurs
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SOIL LINK in each farm, each year :

$$LS = \frac{\text{Manure production}}{\text{Spreading capacity}}$$

If $LS > 1$: exportation of manure in a other farm or derogation

La structure d'encadrement des agriculteurs
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Le survey nitrate



A derogation of these limits (210 becomes 250 and 80 becomes 130) can be granted if the farmers undertake to follow a derogation with very close surveillance and the implementation of specific nitrogen-control techniques.

Such evidence of good nitrogen management in their farming practice is obtained by means of the soil nitrate concentration profiles established at the beginning of the leaching period and compared with standards (see: Agricultural Surface survey)



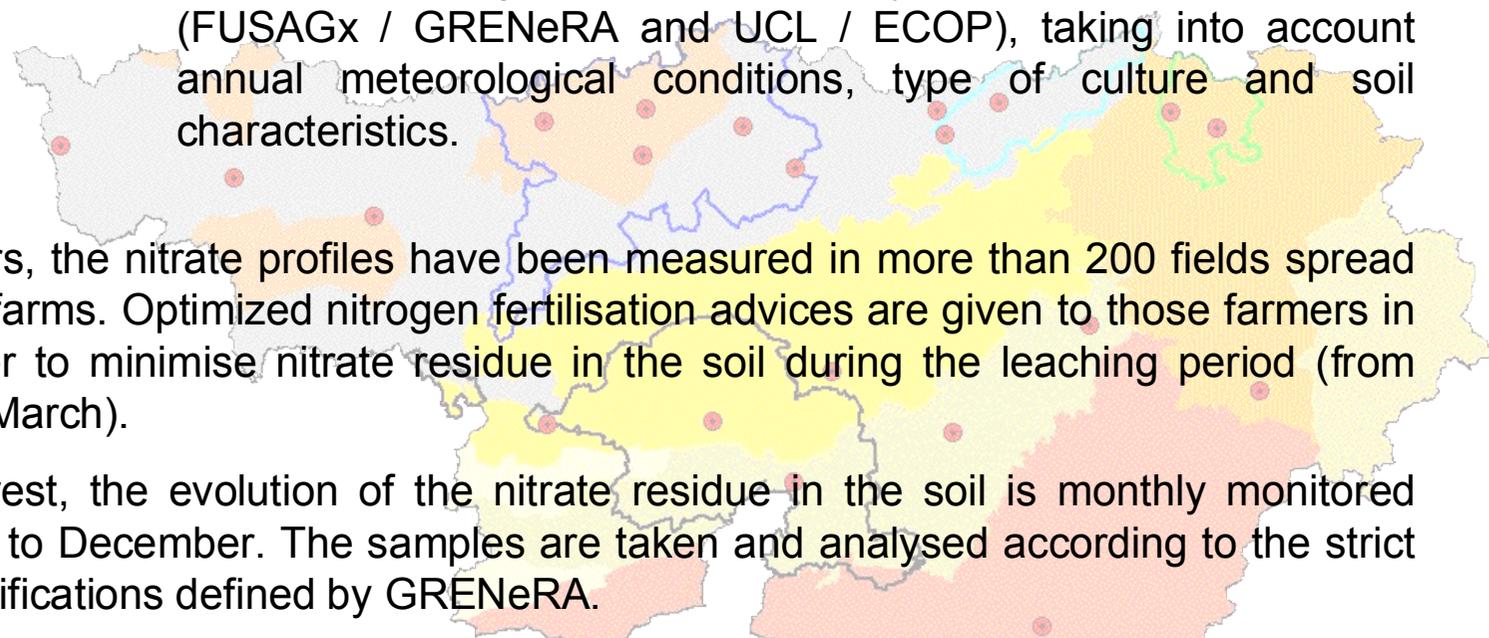
La structure d'encadrement des agriculteurs
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In order to fix these annual standards, a 25 pilot farms network (part of the Agricultural Surface Survey) distributed throughout the Walloon Region is monitored by the two scientific teams (FUSAGx / GRENeRA and UCL / ECOP), taking into account annual meteorological conditions, type of culture and soil characteristics.

For three years, the nitrate profiles have been measured in more than 200 fields spread over the pilot farms. Optimized nitrogen fertilisation advices are given to those farmers in spring in order to minimise nitrate residue in the soil during the leaching period (from November to March).

After the harvest, the evolution of the nitrate residue in the soil is monthly monitored since October to December. The samples are taken and analysed according to the strict technical specifications defined by GRENeRA.

The results are used to establish annual standards.



Vulnerable Zones

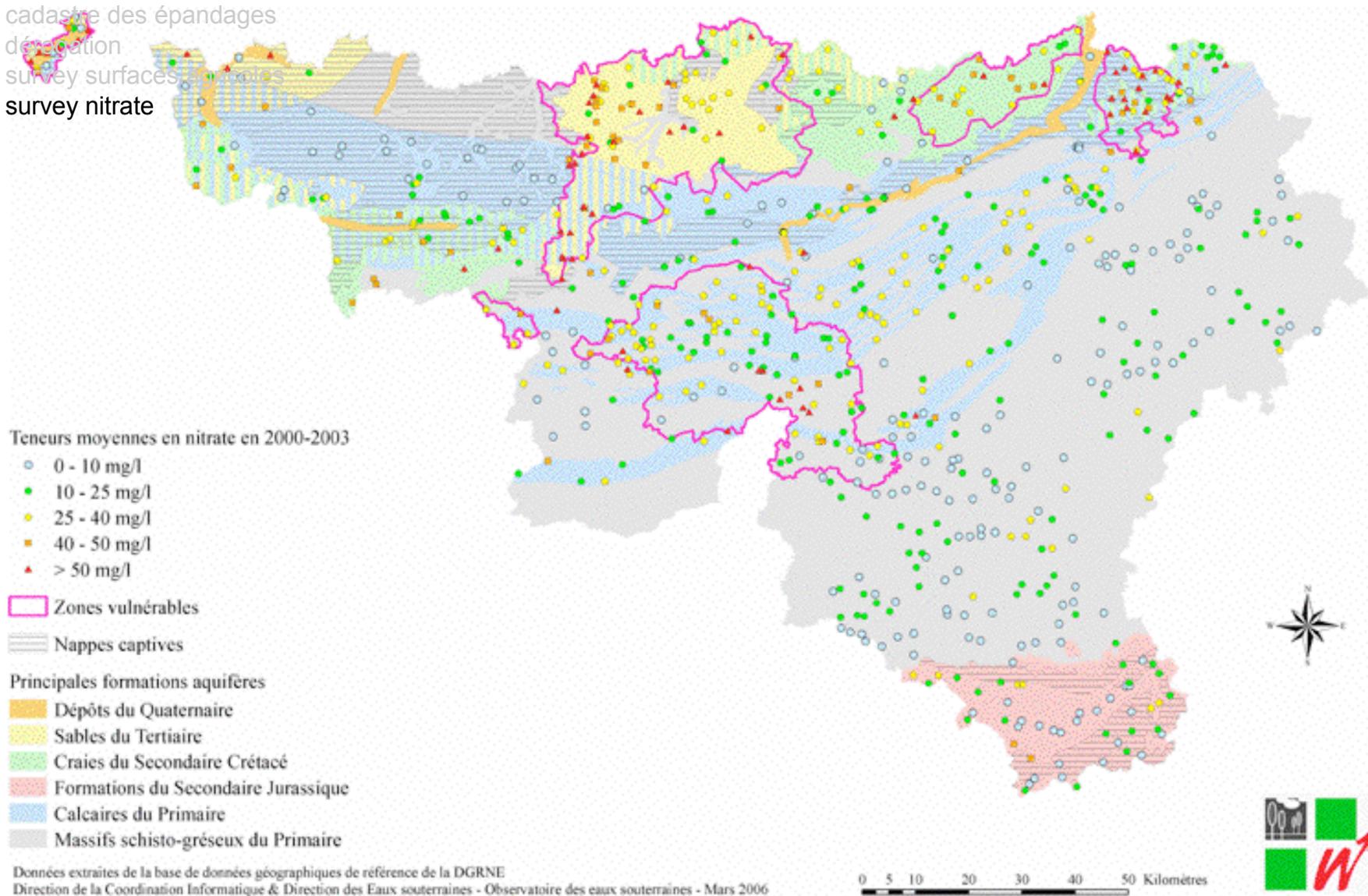
-  Comines-Warneton
-  Crétacé de Hesbaye
-  Sables bruxelliens
-  Sud Namurois
-  Pays de Herve

Pedological zones

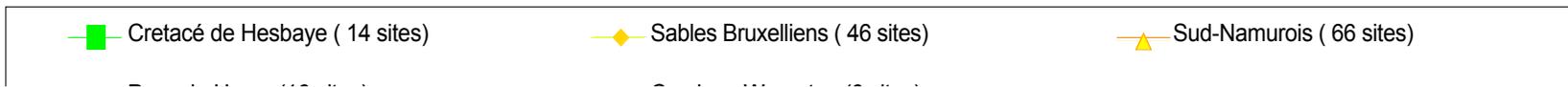
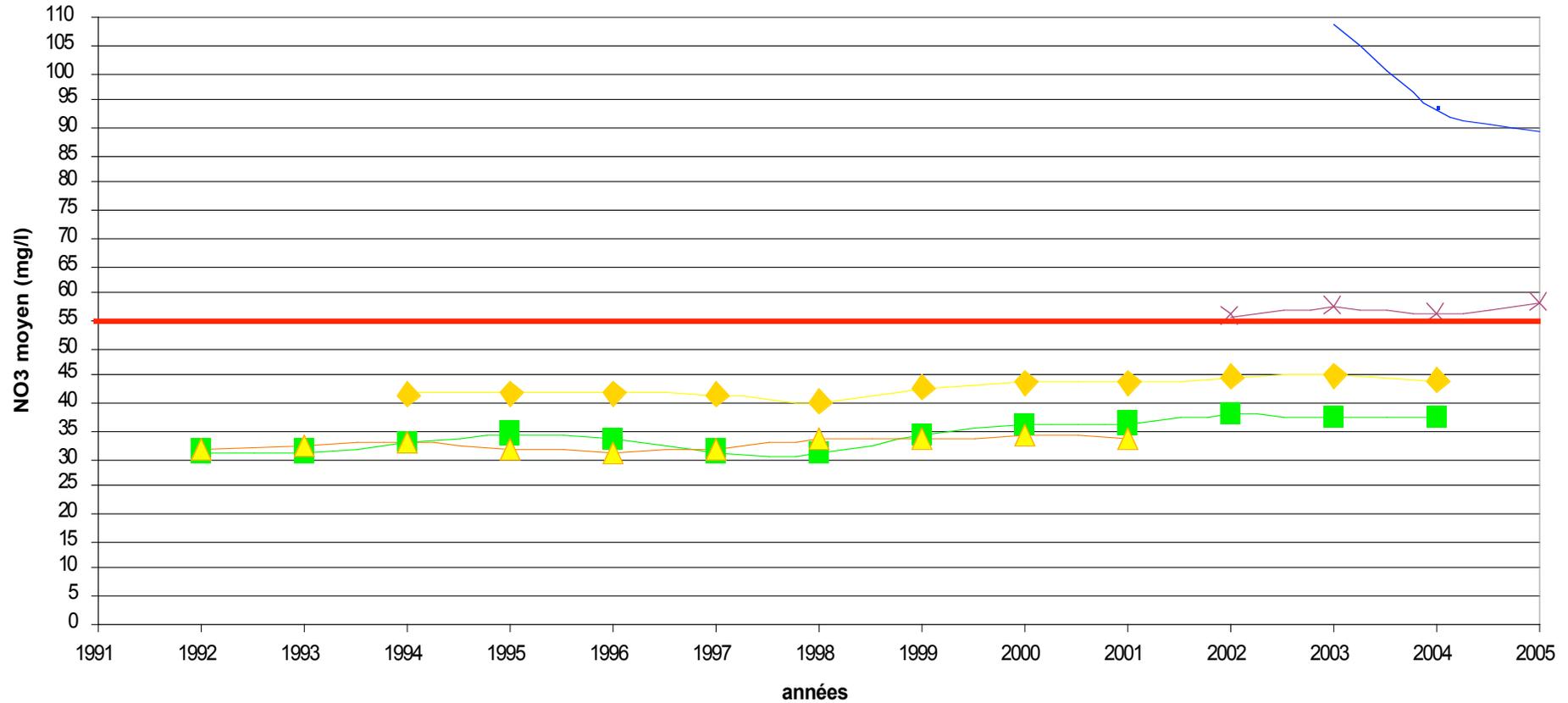
-  Ardenne
-  Condroz
-  Famenne
-  Haute Ardenne
-  Herbagère (Fagne)
-  Herbagère (Liège)
-  Jurassique
-  Limoneuse
-  Sablo-limoneuse

 Pilot farms

La structure d'encadrement des agriculteurs
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 Le survey nitrate



Indicateurs de tendance du Survey Nitrates.



Evaluation of the country's Programmes

Data from the year 2000 report

Member State	Trends		
	Ground water	Surface waters	Coastal/marine waters
Belgium	n.d.	⇒	n.d.
Denmark	⇒	⇒ to ↘	↘
Germany	↗ ↘	⇒	↘
Greece	↗ ↘	n.d.	n.d.
Spain	n.d.	n.d.	n.d.
France	↗	↗ to ↗ ↘	n.d.
Ireland	n.d.	↗ ↘	n.d.
Italy	n.d.	n.d.	n.d.
Luxembourg	n.d.	↗	n.a.
Netherlands	↗ ↘	↗ ↘	↘
Austria	⇒	⇒	n.a.
Portugal	⇒	n.d.	n.d.
Finland	⇒ to ↘	n.d.	⇒
Sweden	↗	n.d.	n.d.
UK	n.d.	n.d.	n.d.
Total	⇒ to ↗	⇒ to ↘	⇒ to ↘

⇒= stable; ↗ = increase; ↘ = decrease; ↗ ↘= contrasted.
n.a. = not applicable; n.d. = no data provided in year 2000 report.

Measure	B-Flan.	B-Wal.
Period of prohibition of fertiliser application	☺ / ☺	☺ / ☹
Restrictions for application on steeply sloping ground	☺ / ☺	☺ / ☹
Restrictions for application on soaked, frozen or snow-covered soils	☺	☺ / ☹
Restrictions for application near water courses (buffer strips)	☺ / ☺	☺
Effluent storage works (safety)	☹	☺
Capacity of manure storage	☺ / ☹	☺ / ☺
Rational fertilisation (e.g. splitting fertilisation, limitations)	☺	☺ / ☺
Crop rotation, permanent crop maintenance	☹	☺
Vegetation cover in rainy periods, winter	☺	☹
Fertilisation plans, spreading records	☺	☹
Other measures	☺	☺
Date for application limits: 210/170 kg N/ha.year	☺	☺

☺=good ☺=moderate ☹=insufficient

Recent EC complaints against Walloon Region :

(Judgment of the Court (Third Chamber) of 22 September 2005)

- the Walloon Region action programme was adopted belatedly
- the Walloon order does not fulfil all the requirements of the Directive

==> The Belgian Government takes note of the Commission's arguments and considers that the efforts made since 1999, for example the Walloon programme for the sustainable management of nitrogen in agriculture, should be taken into consideration.

CONCLUSION : the work continues !!!

FURTHER INFORMATION :



www.nitrawal.be

www.grenera.be

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