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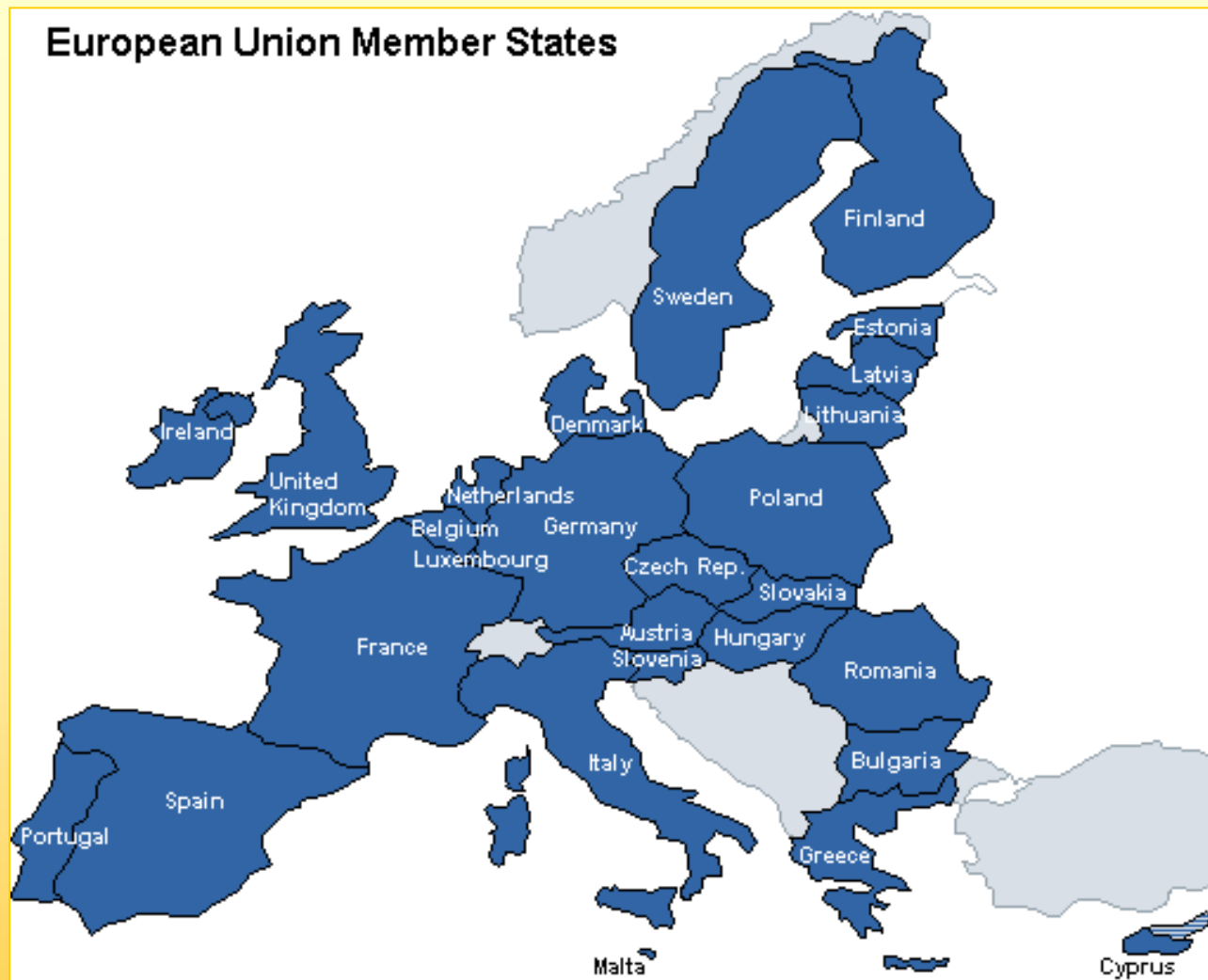
Towards sustainable agricultural NP turnover in the EU 27 countries, *A Review*

Péter Csathó and László Radimszky
RISSAC of HAS
csatho@rissac.hu



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Information** - in the European Union -,
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**This presentation
is dedicated
to the dialogue between the
Western and the Eastern
part of the EU,
for the benefit
of the common people
in both macroregions**



‘Union: a uniting into a coherent and harmonious whole’

Webster’s Dictionary

**How much does fit EU NP
turnover to the above
description of “Union”?**

Nitrogen and Phosphorus:

**The two potentially most
harmful crop nutrients to cause
agronomic production - related
loads to the environment**

The recommended N, P₂O₅ and K₂O kg/ha doses are calculated according to the environmentally friendly RISSA-RIA-PP₃M advisory system's formula :

$$\mathbf{F = (Ye \times Sy \times M) \pm C}$$

where...

- F** recommended N, P₂O₅ and K₂O kg/ha doses,
- Ye** the expected yield level,
- Sy** “specific nutrient contents”, [kg/t], depending on the expected yield level,
- M** multiplication factor, depending on the soil nutrient supply categories,
- C** fertilizer dose correcting factors (type of pre-crop, aboveground plant residues remaining on the field, previous farmyard manure application, etc.).

Shorthcomings of the EU Nitrates Directive

1) Deals with the *factors* of the environmentally friendly NP fertiliser advisory system *as with independent ones*

At NP fertiliser demands, *does not take* into account

- Soil NP supplies
- Applied NP via manure / slurry

Soil phosphorus supply/status should appear as an important EU agro-environmental indicator

NP fertiliser equivalency of manure/slurry

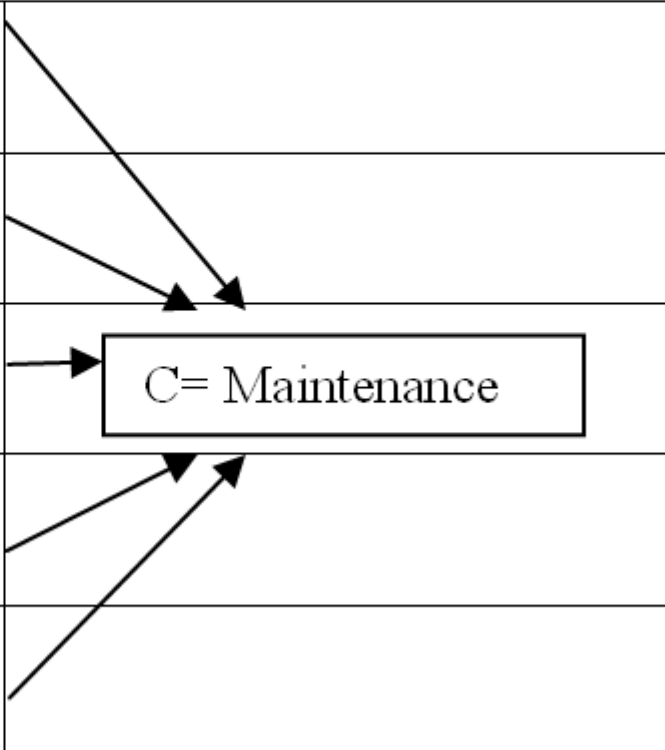
N in fertiliser → N in manure: 50-70%

P in fertiliser → P in manure: 100%

altogether in a three to four year period

Phosphorus fertiliser recommendation for fields in Germany based on soil fertility class (STP) (Vetter and Fruchtenicht (1974),)

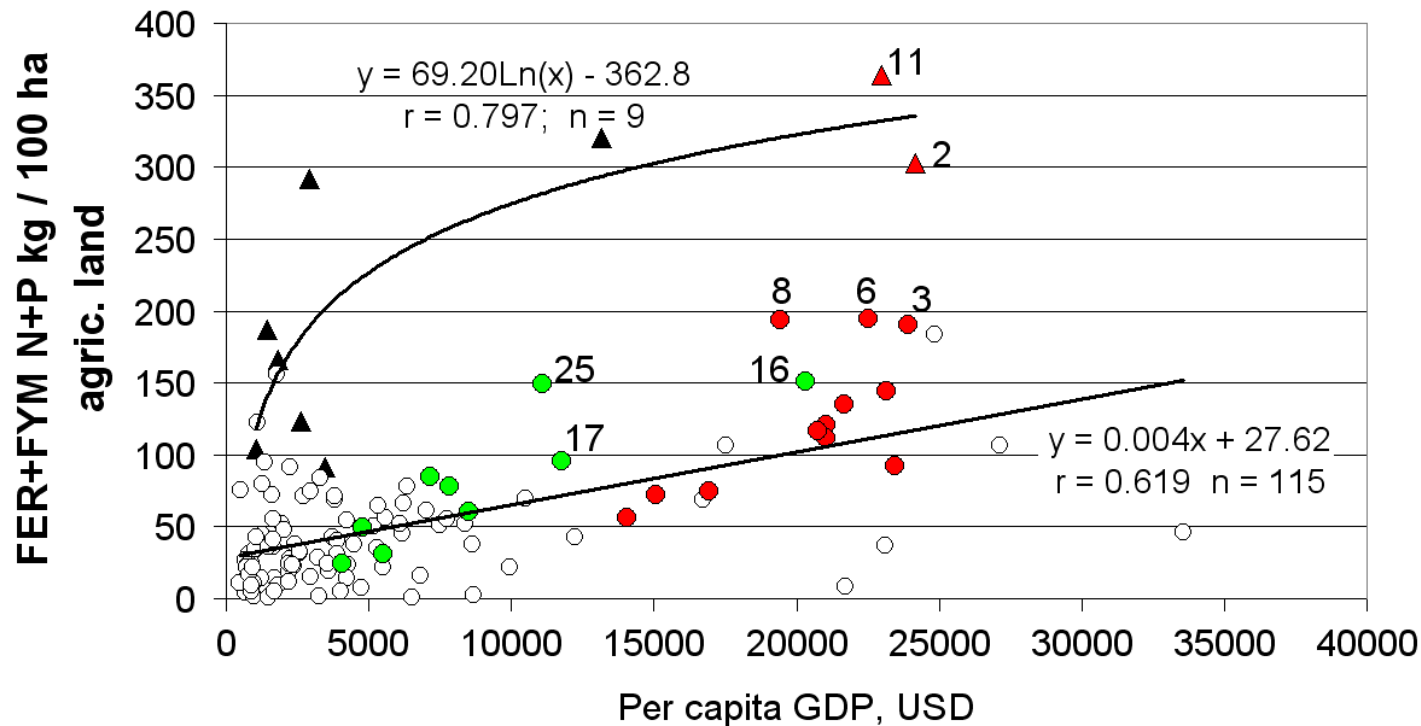
Fertility Class	Fertiliser Ratio	
E: Very high	0	
D: High	0.5	
C: Moderate	1.0	C= Maintenance
B: Low	1.5	
A: Very low	2.0	

A diagram consisting of five arrows pointing from the right side of the table rows to a rectangular box. The arrows originate from the right edge of the 'E: Very high' row, the right edge of the 'D: High' row, the right edge of the 'C: Moderate' row, the right edge of the 'B: Low' row, and the right edge of the 'A: Very low' row. All five arrows converge on the left side of the box labeled 'C= Maintenance', which is positioned to the right of the 'C: Moderate' row.

**In fact, which factors did affect
mostly organic and mineral NP
use in the EU countries?**

Correlation between per capita income and total NP application as a function of population density in 2000

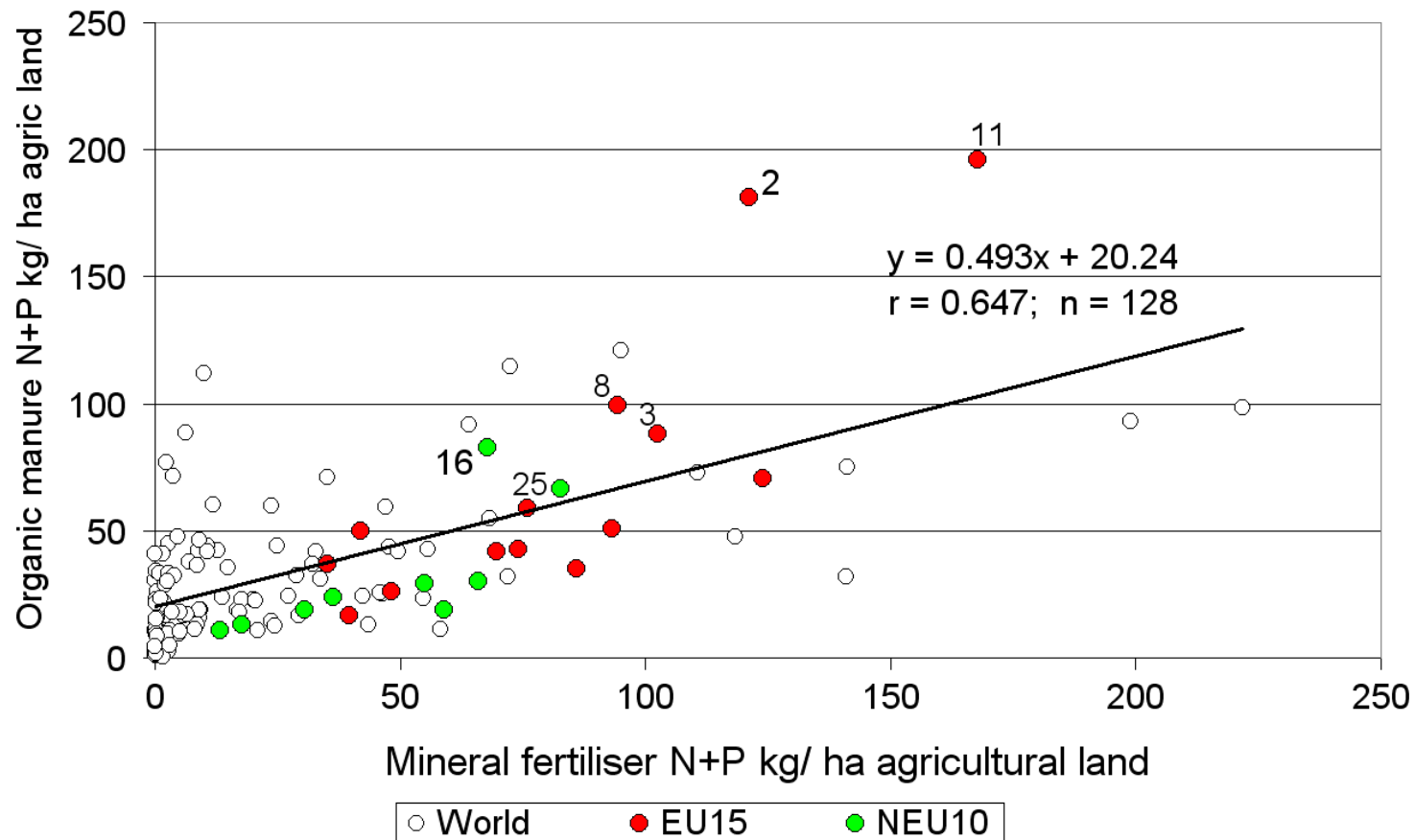
1 - Austria	7 - Greece	14 - Sweden	20 - Latvia
2 - Belgium and Lux.	8 - Ireland	15 - UK	21 - Lithuania
3 - Denmark	9 - Italy	16 - Cyprus	23 - Poland
4 - Finland	11 - Netherlands	17 - Czech Rep.	24 - Slovakia
5 - France	12 - Portugal	18 - Estonia	25 - Slovenia



- | | |
|-----------------------------------------------|------------------------------------------------|
| ▲ >600 people / 100 ha agricultural land | ○ <600 people / 100 ha agricultural land |
| ● EU15 <600 people / 100 ha agricultural land | ● NEU10 <600 people / 100 ha agricultural land |
| ▲ EU15 >600 people / 100 ha agricultural land | |

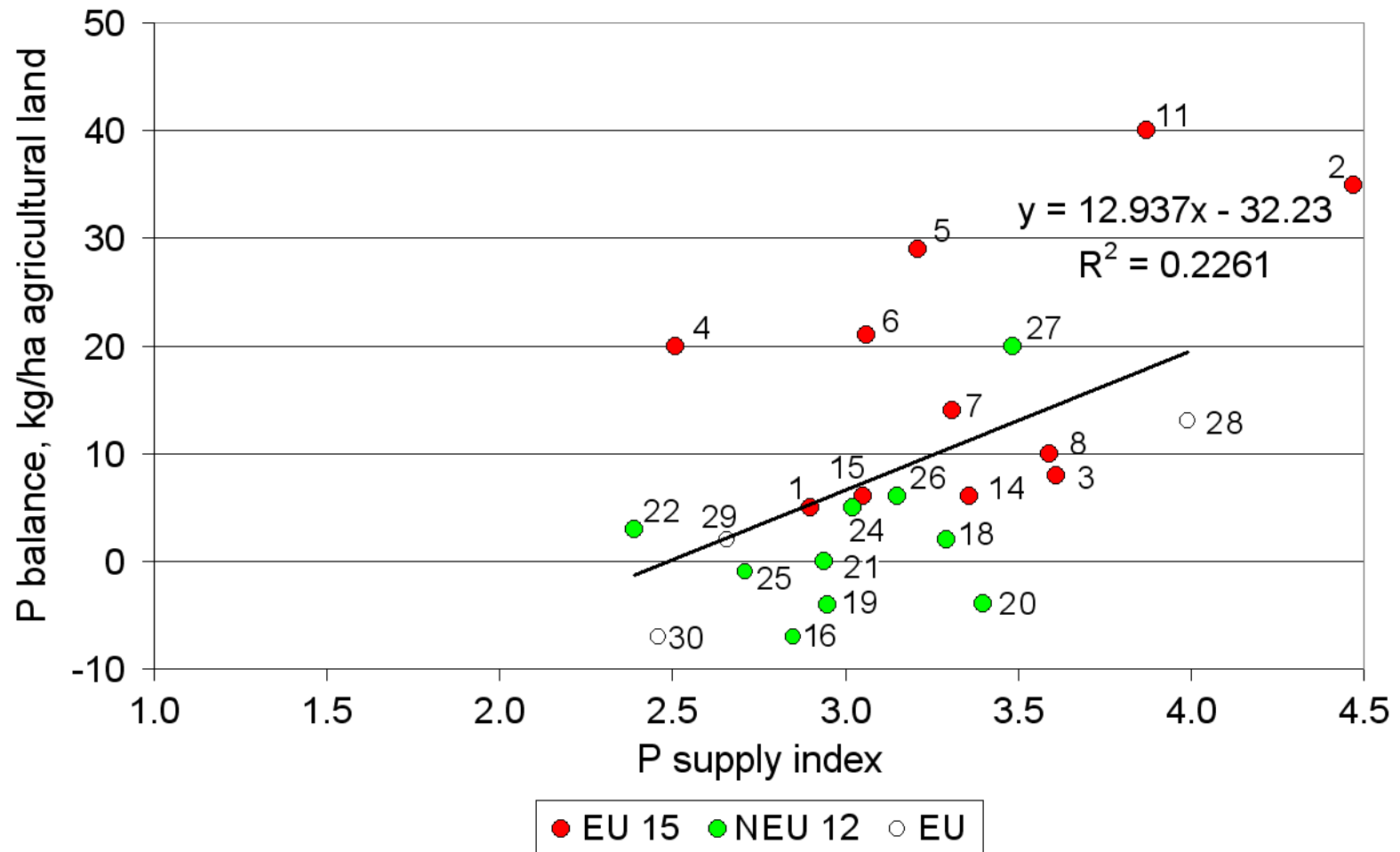
Correlation between organic and mineral NP use in 2000

1 – Austria	7 – Greece	14 – Sweden	20 – Latvia
2 – Belgium and Lux.	8 – Ireland	15 – UK	21 – Lithuania
3 – Denmark	9 – Italy	16 – Cyprus	23 – Poland
4 – Finland	11 – Netherlands	17 – Czech Rep.	24 – Slovakia
5 – France	12 – Portugal	18 – Estonia	25 – Slovenia
6 – Germany	13 – Spain	19 – Hungary	

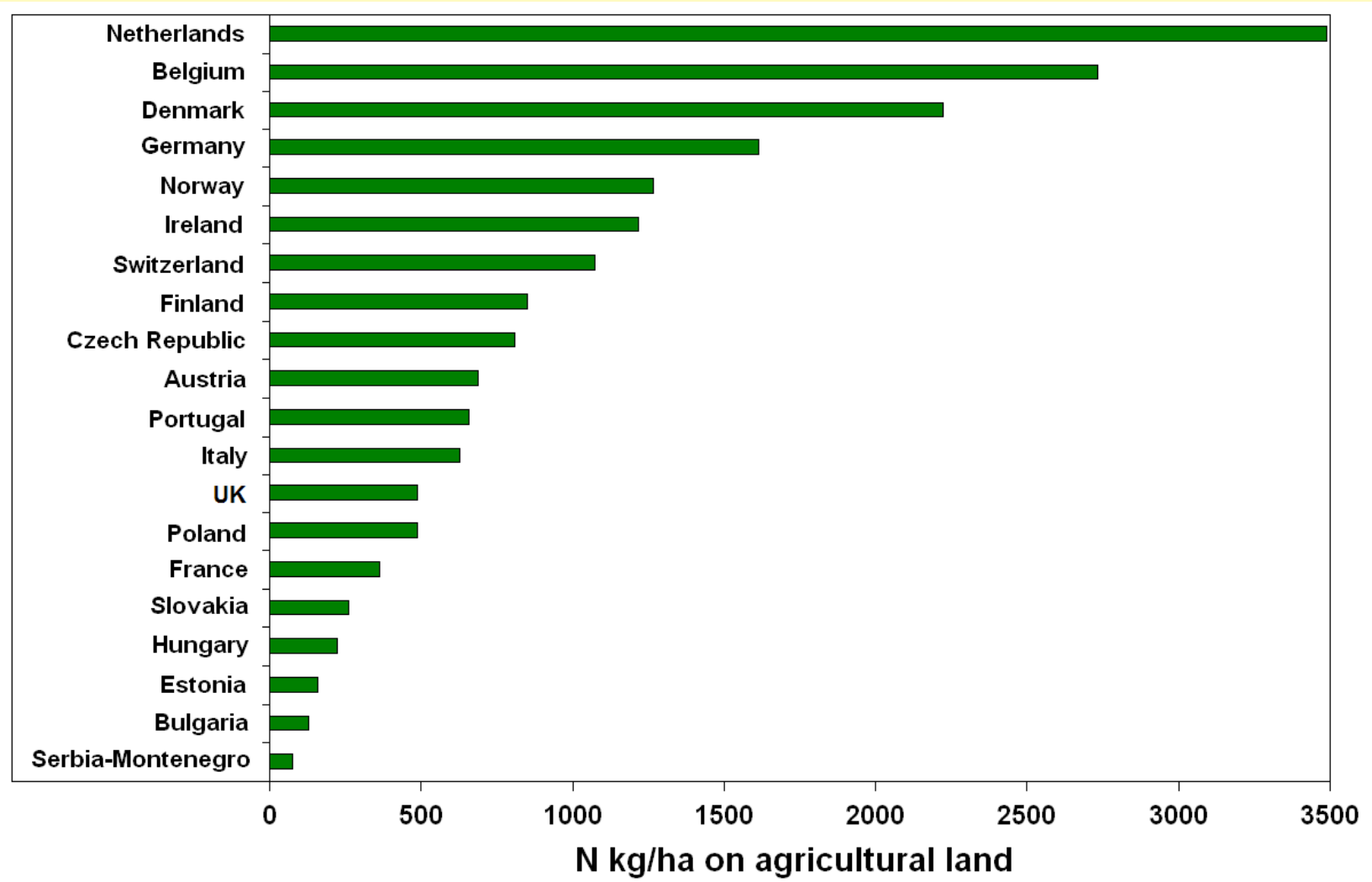


Correlation between P supply and P balances of the EU countries in 1991

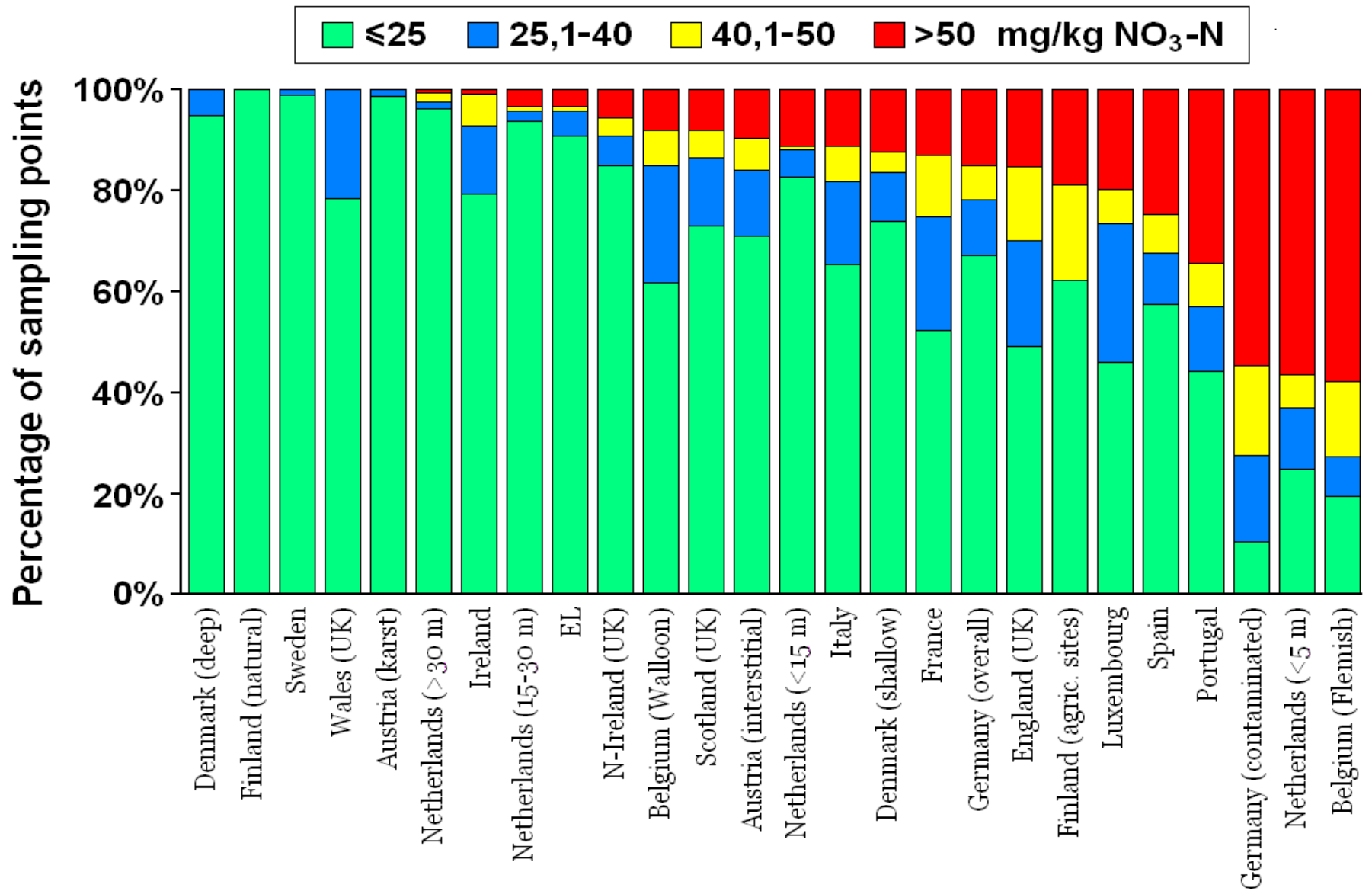
1 – Austria	6 – Germany	12 – Portugal	17 – Cyprus	22 – Lithuania	27 – Slovenia
2 – Belgium and Lux.	7 – Greece	13 – Spain	18 – Czech Rep.	23 – Malta	28 – Norway
3 – Denmark	8 – Ireland	14 – Sweden	19 – Estonia	24 – Poland	29 – Serbia and Montenegro
4 – Finland	9 – Italy	15 – UK	20 – Hungary	25 – Romania	30 – Ukraine
5 – France	11 – Netherlands	16 – Bulgaria	21 – Latvia	26 – Slovakia	



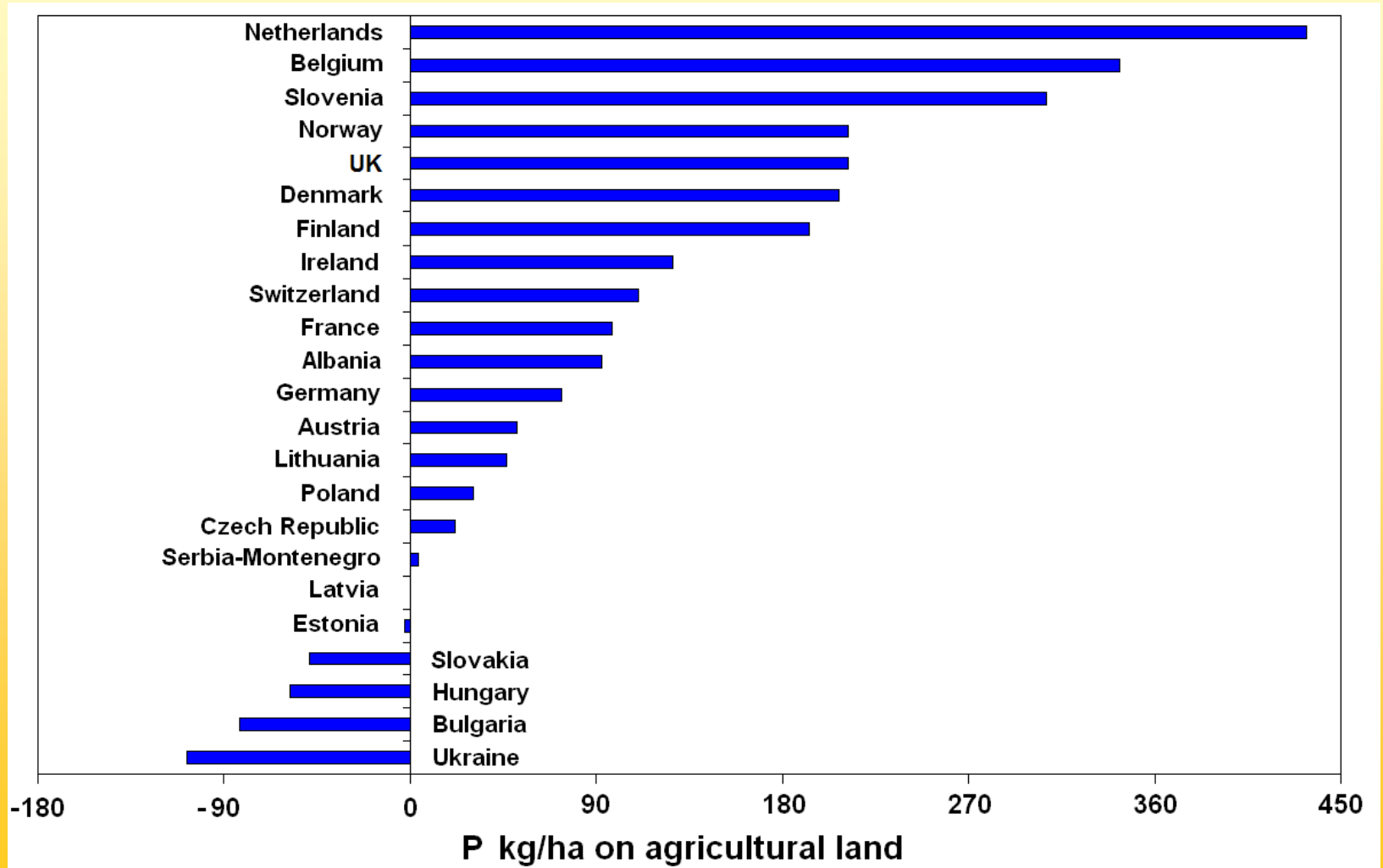
Estimated OECD cumulative N balance of European countries, 1991–2005 (N kg/ha agricultural land)

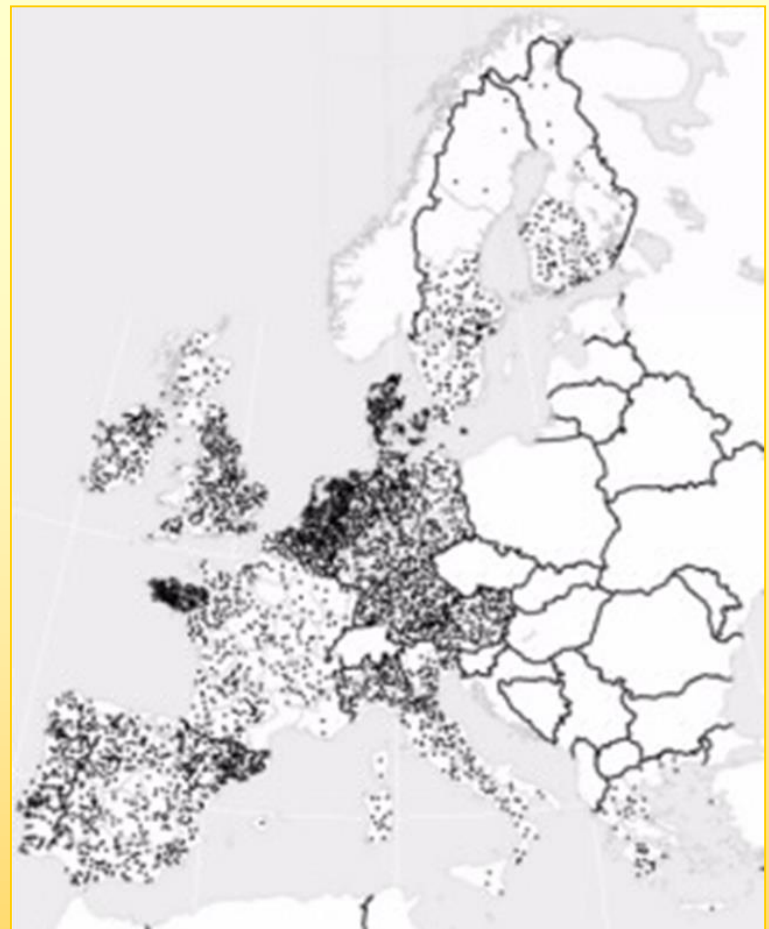
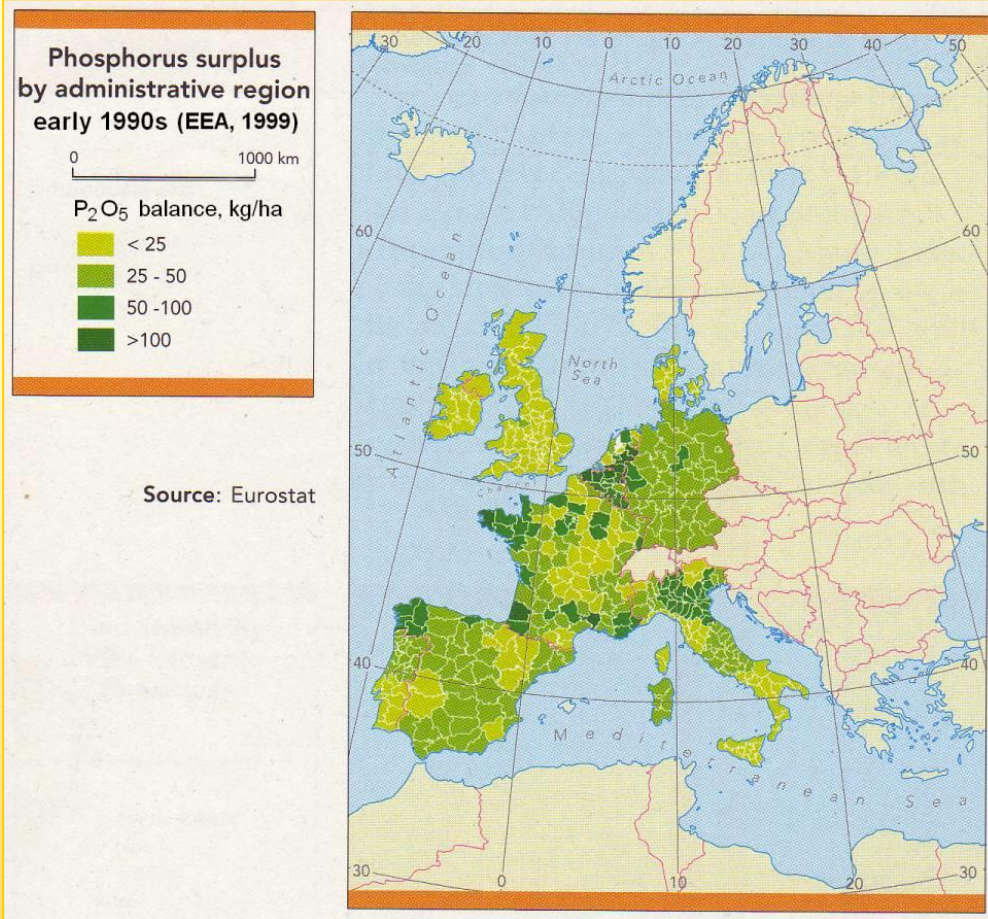


Ground water status of some EU 15 countries in the mid 2000's (Hamell, 2007)



Estimated OECD cumulative P balance of European countries, 1991–2005 (P kg/ha agricultural land)





**Phosphorus balances
in the EU12 countries,
in the early 1990s in
NUTS 2 levels**

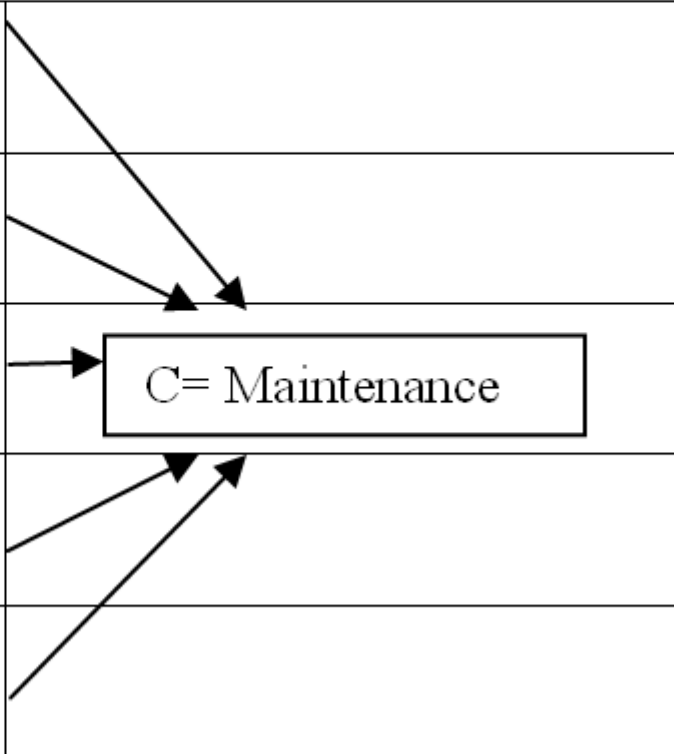
(Stanners and Bourdeau, 1995)

**Pig population density
in Western Europe**

(World Bank, 2005)

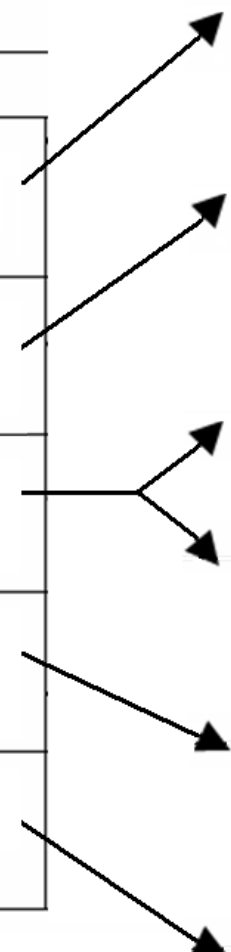
Phosphorus fertiliser recommendation for fields in Germany based on soil fertility class (STP) (Vetter and Fruchtenicht (1974),)

Fertility Class	Fertiliser Ratio	
E: Very high	0	
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C: Moderate	1.0	C= Maintenance
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A: Very low	2.0	



The diagram illustrates the relationship between soil fertility classes and fertilizer ratios. A box labeled 'C= Maintenance' is positioned to the right of the 'C: Moderate' row. Arrows point from the 'Fertility Class' and 'Fertiliser Ratio' columns of rows D, C, and B towards this box, indicating that the maintenance level is associated with these classes and ratios.

Fertility Class	Fertiliser Ratio
E: Very high	2.0
D: High	1.5
C: Moderate	1.0
B: Low	0.5
A: Very low	0

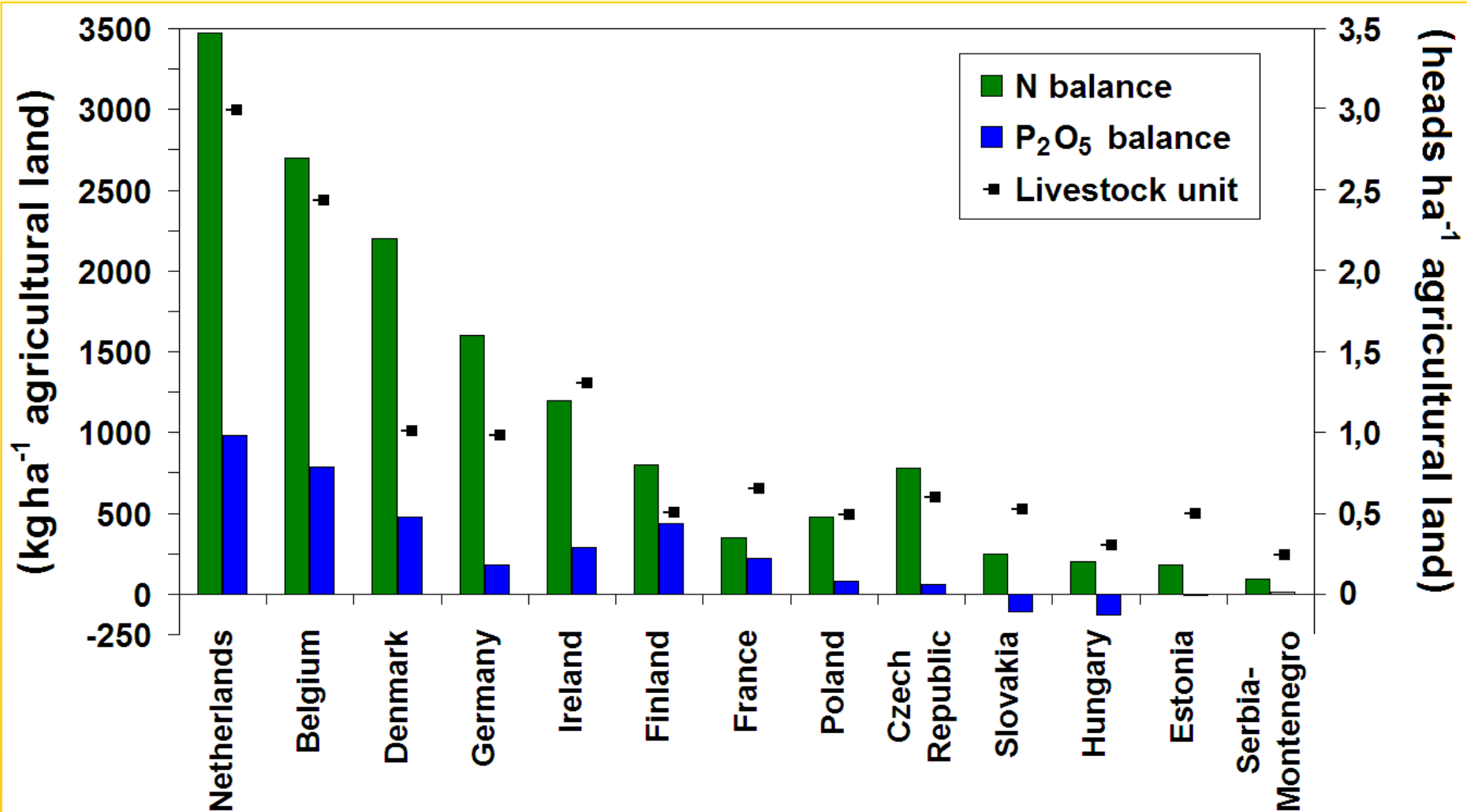


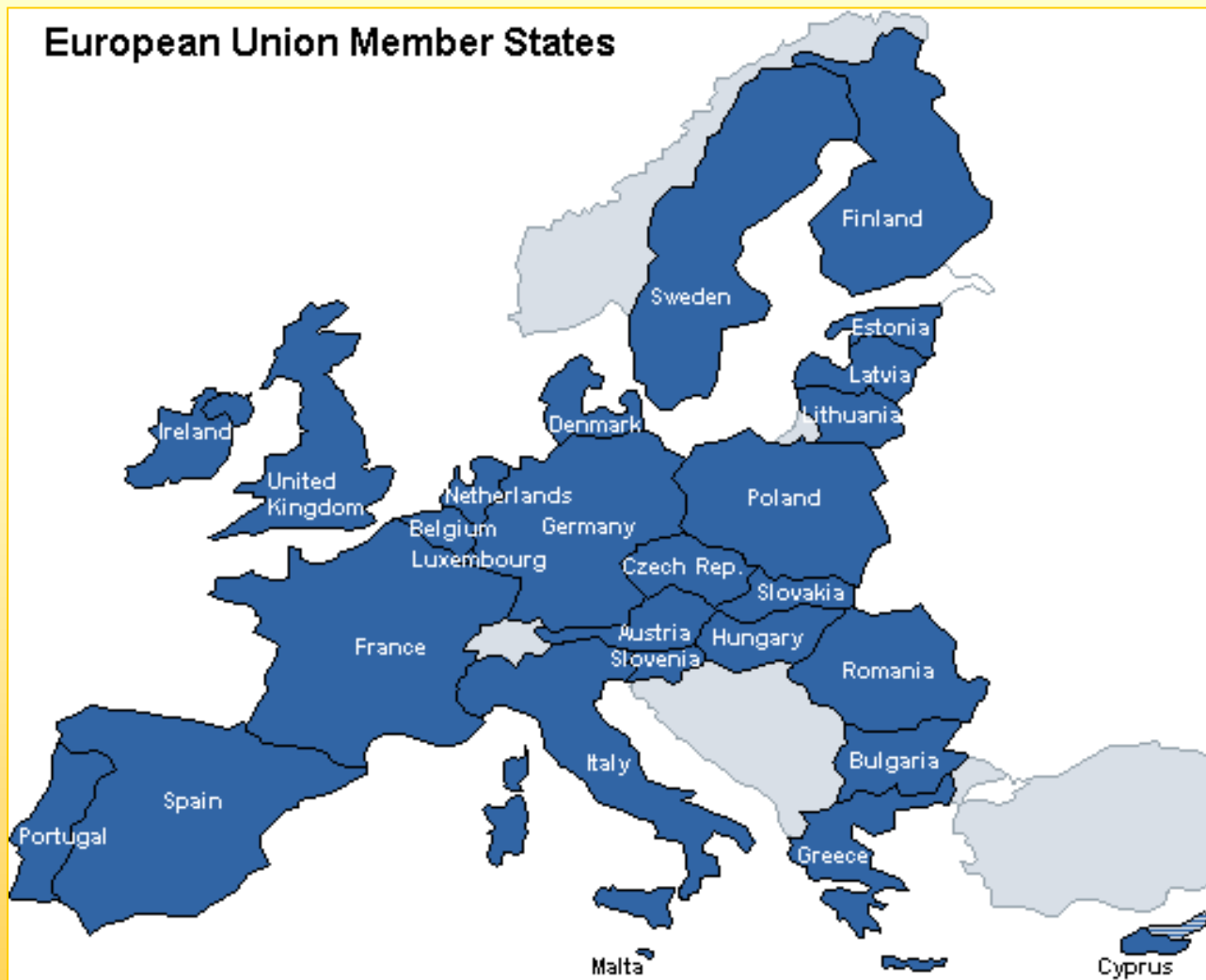
Severe environmental threats

(Western European EU countries)

Severe agronomic, social, and rural development problems; agony of the countryside (Eastern and Central European EU countries)

Estimated cumulative NP balances between 1991 and 2005 as well as livestock density of several European countries. (Csathó & Radimszky, 2009)





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Webster’s Dictionary

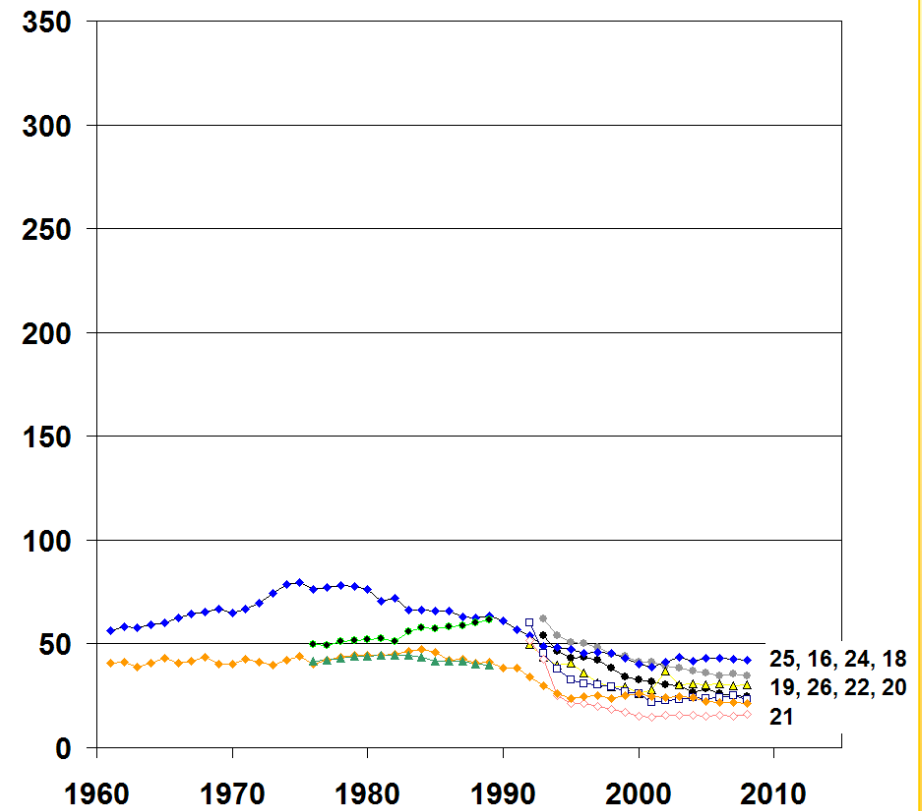
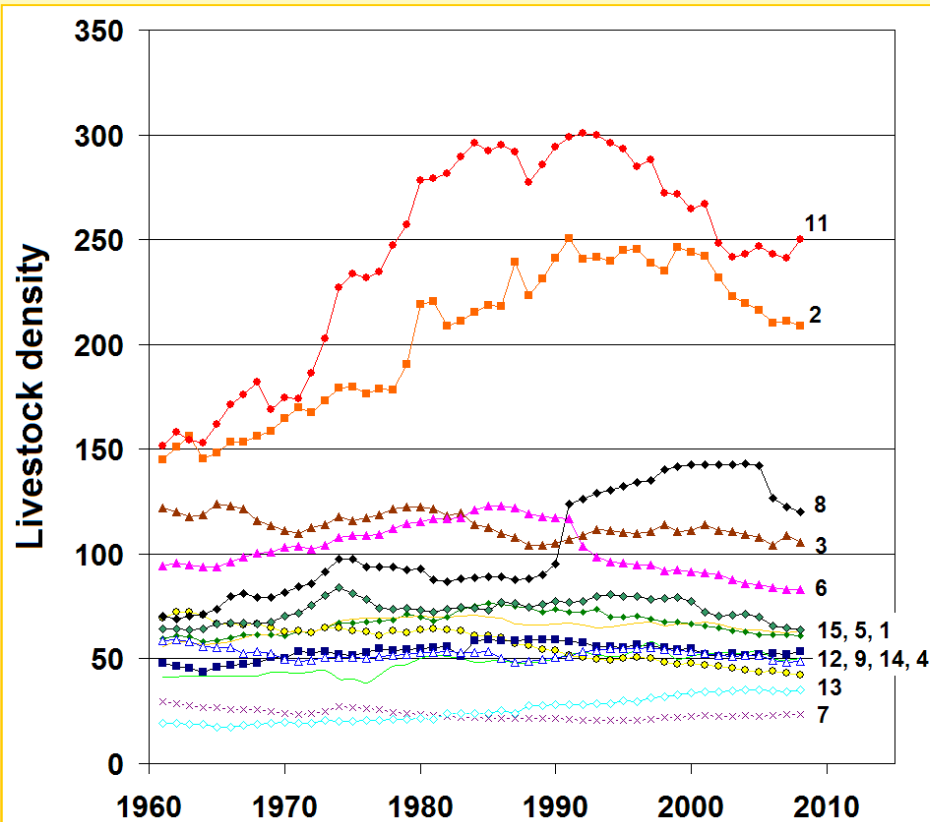
So that to fit EU NP turnover to the description of „Union”,

- Principles of the environmentally friendly / sustainable N fertiliser advisory system should be built in the EU Nitrates Directive urgently.
- A new, independent Phosphates Directive should be elaborated and implemented urgently
- Principles of the environmentally friendly / sustainable P fertiliser advisory system should be built in the new EU Phosphates Directive.

Livestock density (heads/100 ha) in...

Western Europe

Central and Eastern Europe



- ◆ 1 Austria
- ◆ 2 Belgium-Lux.
- ◆ 3 Denmark
- ◆ 4 Finland
- ◆ 5 France
- ◆ 6 Germany
- ◆ 7 Greece
- ◆ 8 Ireland
- ◆ 9 Italy
- ◆ 11 Netherlands
- ◆ 12 Portugal
- ◆ 13 Spain
- ◆ 14 Sweden
- ◆ 15 United Kingdom

- ◆ 16 Bulgaria
- ◆ 17 Cyprus
- ◆ 18 Czech Republic
- ◆ 19 Estonia
- ◆ 20 Hungary
- ◆ 21 Latvia
- ◆ 22 Lithuania
- ◆ 23 Malta
- ◆ 24 Poland
- ◆ 25 Romania
- ◆ 26 Slovakia
- ◆ 27 Slovenia
- ◆ 28 Czechoslovakia
- ◆ 29 Yugoslavia SFR

Thank you for your attention!