

## NUTRIENT USE IN AGRICULTURE

Inputs of nutrients, such as nitrogen and phosphorus, are important in farming systems as they are critical in raising plant productivity, and a nutrient deficiency can impair soil fertility. A build up of surplus nutrients in excess of crop and forage needs can lead to losses representing a possible cause of economic inefficiency in nutrient use and also a source of potential environmental harm, in terms of water pollution (e.g. eutrophication of water), and air pollution (e.g. ammonia), while the sustainability of phosphorus resources is a concern as world reserves are diminishing.

### Definition

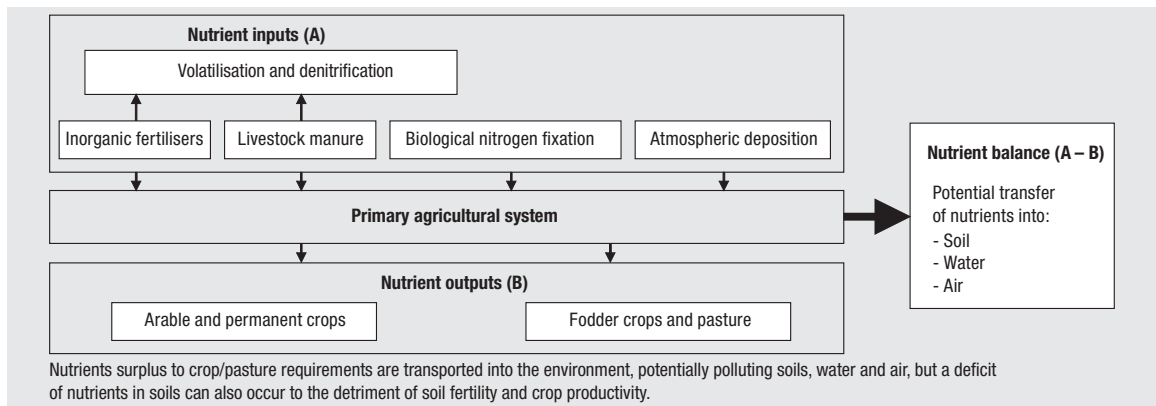
Gross nutrient balances are calculated as the difference between the total quantity of nutrient inputs entering an

agricultural system, and the quantity of nutrient outputs leaving the system. This calculation can be used as a proxy to reveal the status of environmental pressures, such as declining soil fertility in the case of a nutrient deficit, or for a nutrient surplus the risk of polluting soil, water and air.

### Comparability

The nutrient balance indicators are expressed in terms of the kilograms of nutrient surplus (deficit) per hectare of agricultural land per annum, and in terms of changes in the physical quantities (tonnes) of nutrient surpluses (deficits). The former is an intensity indicator and the latter provide an indication of the trend and level of potential physical pressure of nutrient surpluses into the environment.

### The main elements in the OECD gross nutrient (nitrogen and phosphorus) balance



### Long-term trends

The decrease in nutrient balance surpluses has contributed to reduced pressures on soil, water and air, although a third of OECD countries registered an increase in surpluses. Rising or large nitrogen surpluses are commonly a result of the intensification of livestock production, since the growth in the use of inorganic nitrogen fertilisers has been limited in most countries. Where adoption of nutrient management plans has been high, this has had an impact in reducing surpluses, but there is further potential to reduce nutrients to levels that are not environmentally damaging. In most countries there is considerable variation in the level and trends of regional nutrient balances around national averages.

### Source

- OECD (2008), *Environmental Performance of OECD Agriculture since 1990*, OECD, Paris.

### Further information

#### Analytical publications

- OECD (1999), *Environmental Indicators for Agriculture: Concepts and Framework, Volume 1*, OECD, Paris.
- OECD (1999), *Environmental Indicators for Agriculture: Issues and Design – “The York Workshop”, Volume 2*, OECD, Paris.
- OECD (2007), *Environmental Indicators for Agriculture: Volume 3*, OECD, Paris.
- OECD (2008), *Environmental Performance of OECD Agriculture since 1990*, OECD, Paris.

#### Methodological publications

- OECD (2007), *OECD Nitrogen Balance Handbook*, only available online at website below, OECD, Paris.
- OECD (2008), *OECD Phosphorus Balance Handbook*, only available online at website below, OECD, Paris.

#### Online databases

- OECD Nitrogen Balance Database.


#### Websites

- OECD Agri-Environmental Indicators, [www.oecd.org/agr/env/indicators.htm](http://www.oecd.org/agr/env/indicators.htm).

## Gross agricultural nutrient balances

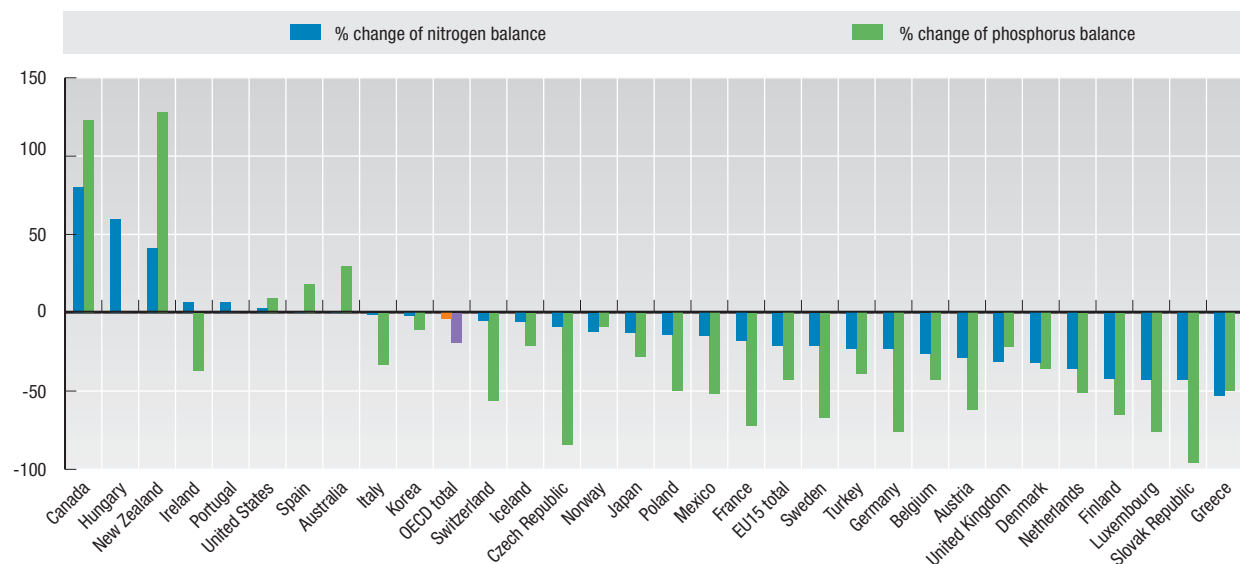

Balance expressed as kg nutrient per hectare of total agricultural land

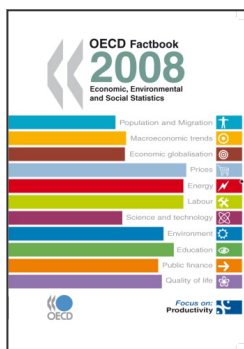
	Nitrogen			Phosphorus		
	Average 1990-1992	Average 2002-2004	% Change	Average 1990-1992	Average 2002-2004	% Change
Australia	16	17	5	1	1	35
Austria	66	48	-27	7	3	-61
Belgium	255	184	-28	41	23	-45
Canada	19	35	85	1	1	137
Czech Republic	77	70	-9	10	2	-84
Denmark	178	127	-29	17	11	-33
Finland	83	55	-34	20	8	-60
France	63	54	-16	13	4	-71
Germany	145	113	-22	16	4	-75
Greece	32	15	-52	8	4	-49
Hungary	21	37	74	-4	-1	..
Iceland	7	7	-5	2	1	-21
Ireland	76	83	9	10	6	-35
Italy	33	39	16	14	11	-22
Japan	180	171	-5	65	51	-21
Korea	213	240	13	47	48	2
Luxembourg	229	129	-44	48	11	-77
Mexico	27	22	-18	2	1	-53
Netherlands	345	229	-34	38	19	-49
New Zealand	31	46	46	6	14	136
Norway	92	77	-16	15	13	-13
Poland	49	48	-2	5	3	-43
Portugal	42	47	13	15	15	5
Slovak Republic	80	46	-43	15	1	-96
Spain	32	33	5	6	8	23
Sweden	57	48	-16	5	2	-65
Switzerland	77	76	-1	12	5	-55
Turkey	37	28	-24	9	5	-40
United Kingdom	56	43	-23	15	13	-13
United States	34	37	7	3	3	13
EU15 total	113	83	-26	18	10	-48
OECD total	88	74	-17	16	10	-37

StatLink  <http://dx.doi.org/10.1787/274874233644>

## Gross agricultural nitrogen and phosphorus balances

Change in averages 1990-92 to 2002-04 expressed as tonnes of nutrients

StatLink  <http://dx.doi.org/10.1787/270316550388>



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