

Table 1: Total Nitrogen and Phosphorus produced by grazing livestock on your holding

To prepare your fertiliser plan, you must estimate the numbers and categories of grazing livestock that you will have on your holding in the coming year. The average number of grazing livestock is the projected annual average number for the calendar year in question. In the case of holdings where cattle numbers will be similar to the previous year, the annual Nitrogen and Phosphorous Statement from the Department of Agriculture, Fisheries and Food will be a guide for the total amounts of nitrogen and phosphorus produced by cattle. For sheep, the average of numbers and types held on the first day of each quarter of the previous year (derived from your Flock Register) can be used as a guide.

Table 2: Total Nitrogen and Phosphorus produced by non- grazing livestock on your holding

The average number of non-grazing livestock is the projected annual average number of pig/poultry places that are likely to be occupied during the calendar year in question.

Table 3: Projected Exports (-) of Livestock Manure

Manure from non-grazing livestock cannot be applied on the holding. You must include exports of manure from such livestock (e.g. pigs and poultry) in Table 3.

The specified N and P contents of various organic fertilisers (in kg/m³ or kg/tonne) are to be found in Tables 7 and 8 of S.I. No. 101 of 2009 (these tables have been reproduced in the Appendix for ease of reference).

It should be noted that livestock manure may not be imported on to a derogation holding.

The 'Total Nitrogen (G) & Phosphorus (H) from livestock manure to be applied on the holding (kg)' is $A + C - E$ in the case of Nitrogen and $B + D - F$ in the case of Phosphorus.

Table 4: Animal housing

- Number and briefly describe each building used to house grazing livestock (e.g. cattle, sheep, horses) and non-grazing livestock (e.g. pigs and poultry).
- Include outwintering pads in the list, if applicable.
- Identify straw-bedded houses.
- Give the dimensions in metres and the floor area in square metres.
- Set out the numbers and category of stock that are to be housed in each building. Tables 1 and 2 of the Fertiliser Plan list the categories of grazing and non-grazing livestock.

Table 5: Manure storage facilities

- Number, and indicate the type of store (e.g. uncovered steel tank, covered tank) used for the storage of manure from grazing and non-grazing livestock.
- Give the dimensions in metres and the capacity in cubic metres. In the case of farmyard manure (FYM), give the height that the FYM can be heaped to instead of depth.
- See pages 22 to 25 of *Explanatory Handbook for Good Agricultural Practice Regulations* for methodology for checking whether storage capacity for organic fertilisers is adequate.

Table 6: Estimate of annual phosphorus fertiliser requirement

- The fertiliser plan must include a sketch map showing the location of individual fields.
- Set out in Table 6 the estimated requirement for phosphorus for each of the crops that are to be grown during the year.
- Soil analysis must be conducted for all the holding at least once every 4 years. At least one analysis per 5 hectares shall be required. Where available, give the soil sample number in column 1.
- Index 3 must be assumed where no valid soil test result is available for the time being (see Table 11 of *S.I. No. 101 of 2009* for soil phosphorus ranges – also set out in Appendix).
- Be specific when detailing crop type in column 2. In the case of tillage crops, differentiate between Winter and Spring crops.
- In the case of grassland, the requirement for phosphorus fertiliser will vary depending on grassland stocking rate, so the first step is to calculate grassland stocking rate. See page 29 of *Explanatory Handbook for Good Agricultural Practice Regulations* for the methodology of working out grassland stocking rate. In the case of 100% grassland holdings, the grassland stocking rate and the whole farm stocking rate will be the same.
- The maximum fertilisation rates set out in tables 13, 17 19 and 21 of *S.I. No. 101 of 2009* cannot be exceeded. These tables are reproduced in the Appendix for ease of reference.
- The overall total available phosphorus (J) is an estimate of the available phosphorus required by all the crops on the holding. The fertiliser requirement can be met by slurry from your own grazing livestock, concentrates fed to grazing livestock or by purchasing chemical P fertilisers

Table 7: Estimate of annual nitrogen fertiliser requirement

- Set out in Table 7 the estimated requirement for nitrogen fertiliser for each of the crops that are to be grown during the year. The approach is similar to that used for phosphorus in Table 6.
- Do not exceed the maximum fertilisation rates set out in tables 12, 16, 18 and 20 of *S.I. No. 101 of 2009* (see the Appendix).
- The N index only relates to tillage crops.
- The overall total available nitrogen (K) is an estimate of the available nitrogen required by all the crops on the holding. This requirement can be met by slurry from your own grazing livestock or by purchasing chemical N fertilisers

Available nitrogen and phosphorus from grazing livestock manure and concentrates

The estimated amounts of available phosphorus and nitrogen required on the holding (calculated in Tables 6 and 7) to meet crop requirements are partially addressed by available nitrogen and phosphorus that would be produced by grazing livestock over the storage period (unless such manure is exported) and phosphorus contained in concentrates that are to be fed to grazing livestock during the course of the year in question. The available nitrogen and phosphorus from these sources must be set out at the bottom of page 5 of the fertiliser plan.

The **projected available nitrogen in manure that would be produced by grazing livestock on the holding during the storage period (L)** unless exported, can be ascertained by dividing A from Table 1 by 52 and multiplying by the number of weeks storage required for cattle in the zone, and

multiplying by the appropriate nitrogen availability figure for cattle manure (from Table 9 of *S.I. No.101 of 2009* which is included in the Appendix).

The **projected phosphorus that would be produced by grazing livestock on the holding during the storage period (M)** can be ascertained by dividing B from Table 1 by 52, and multiply by the number of weeks storage required in the zone.

The **phosphorus contained in concentrates to be fed to grazing livestock (N)** can be derived by multiplying the anticipated amount of such concentrates (in tonnes) by 5. Concentrates in this context include home produced straights (e.g. cereals) fed to grazing livestock in addition to purchased straights and compounds.

Table 8: Planned nitrogen and phosphorus application

As mentioned previously, livestock manure may not be imported on to a derogation holding. Likewise, manure from non-grazing livestock on the holding may not be applied on the holding. Therefore the total available phosphorus required on the holding (J from Table 6 of your fertiliser plan) and total available nitrogen required on the holding (K from Table 7 of your fertiliser plan) minus the nutrients from the above-mentioned sources (L, M and N) determines the amounts of chemical nitrogen (O) and phosphorus (P) that may be applied on the holding, and require allocation in Table 8.

N.B. Ensure you have taken account of the nutrients in livestock manure and concentrates before purchasing chemical fertilisers.

Slurry/FYM (unless you intend to export)

Calculate the amounts of available nitrogen and available phosphorus that are likely to be produced by grazing livestock on the holding during the anticipated housing period (in the form of slurry or FYM):

Nitrogen: Divide A from Table 1 by 52 and multiply by the number of weeks that the animals are expected to be housed, multiplied by the appropriate nitrogen availability figure for cattle manure (from Table 9 of *S.I. No. 101 of 2009* – see Appendix).

Phosphorus: Divide B from Table 1 by 52 and multiply by the number of weeks that the animals are expected to be housed.

Set out in Table 8 the plots that are to receive slurry or FYM and how much available nitrogen and phosphorus they are to receive and the application rate (in m³ or litres or tonnes/ha). Phosphorus is generally the most limiting nutrient; therefore the volume of slurry or FYM to be applied is determined by dividing the available phosphorus per hectare by the specified phosphorus content of the manure (see Tables 7 and 8 of *S.I. No. 101 of 2009* – also in the Appendix). Allocate chemical nitrogen and phosphorus, making appropriate deductions in the case of plots that are due to receive slurry or FYM.

APPENDIX

Reference Tables, reproduced from Statutory Instrument No. 101 of 2009

European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2006 Revised Regulations SI No 101 of 2009

Table 7 Amount of nutrient contained in 1m³ of slurry

Livestock type	Total Nitrogen (kg)	Total Phosphorus (kg)
Cattle	5.0	0.8
Pig	4.2	0.8
Sheep	10.2	1.5
Poultry – layers 30% DM	13.7	2.9
³ For the purposes of calculation, assume that 1m ³ = 1000 litres = 1 tonne.		

Table 8 Amount of nutrients contained in 1 tonne of organic fertilisers other than slurry

Livestock type		Total Nitrogen (kg)	Total Phosphorus (kg)
Poultry manure	broilers/deep litter	11.0	6.0
	layers 55% dry matter	23.0	5.5
	Turkeys	28.0	13.8
Dungstead manure (cattle)		3.5	0.9
Farmyard manure		4.5	1.2
Spent mushroom compost		8.0	2.5
Sewage sludge		Total nitrogen & total phosphorus content per tonne shall be as declared by the supplier in accordance with the Waste Management (Use of Sewage Sludge in Agriculture) Regulations, 1998 to 2001 and any subsequent amendments thereto.	
Dairy processing residues and other products not listed above		Total nitrogen & total phosphorus content per tonne based on certified analysis shall be provided by the supplier	

Table 9 Nutrient availability in fertilisers

Fertiliser	¹ Availability (%)			
	Nitrogen			Phosphorus
	From Jan 1 2007	From Jan 1 2008	From Jan 1 2010	From Jan 1 2007
Chemical	100	100	100	100
Pig and poultry manure	35	40	50	100
Farmyard manure	20	25	30	100
Spent mushroom compost	35	40	45	100
Cattle and other livestock manure (including that produced on the holding)	30	35	40	100
¹ Refers to year of application				

Table 11 Phosphorus index system

Soil phosphorus index	Soil phosphorus ranges (mg/l)	
	Grassland	Other crops
1	0.0 – 3.0	0.0 - 3.0
2	3.1 – 5.0	3.1 - 6.0
3	5.1 – 8.0	6.1- 10.0
4	> 8.0	>10.0

Table 12 Annual maximum fertilisation rates of available nitrogen on grassland

Grassland stocking rate ¹ (kg/ha/year)	Available nitrogen ² (kg/ha)
≤ 170	226
Grassland stocking rate greater than 170 kg/ha/year ³	
171-210	306
211-250	279
>250	<u>279</u> ⁴

¹ Total annual nitrogen (kg) excreted by grazing livestock averaged over the net grassland area (ha) (grazing and silage area). Stocking rate refers to grassland area only.

² The maximum nitrogen fertilisation of grassland shall not exceed that specified for stocking rates less than or equal to 170 kg/ha/year unless a minimum of 5% of the net area of the holding is used to grow crops other than grass or a derogation applies in respect of the holding.

³ This table does not imply any departure from Article 20(1) which prohibits the application to land on a holding of livestock manure in amounts which exceed 170kg Nitrogen per hectare per year, including that deposited by the animals themselves (or 250kg in the case of a derogated holding).

⁴ The application of Nitrogen from livestock manure (including that deposited by the animals themselves) to the net grassland area shall not exceed 250 kg Nitrogen per hectare per year

Table 13 Annual maximum fertilisation rates of phosphorus on grassland

Grassland stocking rate ¹ (kg/ha/year)	Phosphorus Index			
	1	2	3	4
	Available Phosphorus (kg/ha) ^{2, 3}			
≤ 130	35	25	15	0
131 -170	39	29	19	0
Grassland stocking rate greater than 170 kg/ha/year ^{4, 5}				
171-210	44	34	24	0
211-250	49	39	29	0
<u>>250</u>	<u>49</u>	<u>39</u>	<u>29</u>	<u>0</u>
<p>¹. Total annual nitrogen (kg) excreted by grazing livestock averaged over the net grassland area (grazing and silage area). Stocking rate refers to grassland area only.</p> <p>². The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.</p> <p>³. Manure produced by grazing livestock on a holding may be applied to Index 4 soils on that holding in a situation where there is a surplus of such manure remaining after the phosphorus fertilisation needs of all crops on soils at phosphorus indices 1, 2 or 3 on the holding have been met by the use only of such manure produced on the holding.</p> <p>⁴. The maximum phosphorus fertilisation of grassland shall not exceed that specified for stocking rates less than or equal to 170 kg/ha/year unless a minimum of 5% of the net area of the holding is used to grow crops other than grass or a derogation applies in respect of the holding. .</p> <p>⁵. This table does not imply any departure from Article 20(1) which prohibits the application to land on a holding of livestock manure in amounts which exceed 170kg Nitrogen per hectare per year, including that deposited by the animals themselves (or 250kg in the case of a derogated holding).</p>				

Table 16 Maximum fertilisation rates of nitrogen on tillage crops

Crop	Nitrogen Index			
	1	2	3	4
	Available Nitrogen (kg/ha)			
Winter Wheat ^{1, 2}	190	140	100	60
Spring Wheat ^{1, 2}	140	110	75	40
Winter Barley ¹	160	135	100	60
Spring Barley ¹	135	100	75	40
Winter Oats ¹	145	120	85	45
Spring Oats ¹	110	90	60	30
Sugar Beet	195	155	120	80
Fodder Beet	195	155	120	80
Potatoes: Main crop	170	145	120	95
Potatoes: Early	155	130	105	80
Potatoes: Seed	155	130	105	80
Maize	180	140	110	75
Field Peas/Beans	0	0	0	0
Oilseed Rape	225	180	160	140
Linseed	75	50	35	20
Swedes/Turnips	90	70	40	20
Kale	150	130	100	70
Forage Rape	130	120	110	90
<p>¹ Where proof of higher yields is available, an additional 20kg N/ha may be applied for each additional tonne above the following yields;</p> <p>Winter Wheat - 9.0 tonnes/ha Spring Wheat - 7.5 tonnes/ha Winter Barley - 8.5 tonnes/ha Spring Barley - 7.5 tonnes/ha Winter Oats – 7.5 tonnes/ha Spring Oats – 6.5 tonnes/ha The higher yields shall be based on the best yield achieved in any of the three previous harvests, at 20% moisture content.</p> <p>² Where milling wheat is grown under a contract to a purchaser of milling wheat an extra 30 kg N/ha may be applied</p>				

Table 17 Maximum fertilisation rates of phosphorus on tillage crops

Crop	Phosphorus Index			
	1	2	3	4
	Available Phosphorus (kg/ha)			
Winter Wheat	45	35	25	0
Spring Wheat	45	35	25	0
Winter Barley	45	35	25	0
Spring Barley	45	35	25	0
Winter Oats	45	35	25	0
Spring Oats	45	35	25	0
Sugar Beet	70	55	40	20
Fodder Beet	70	55	40	20
Potatoes: Main crop	125	100	75	50
Potatoes: Early	125	115	100	50
Potatoes: Seed	125	115	100	85
Maize	70	50	40	0
Field Peas	40	25	20	0
Field Beans	50	40	20	0
Oil Seed Rape	35	30	20	0
Linseed	35	30	20	0
Swedes/Turnips	70	60	40	40
Kale	60	50	30	0
Forage Rape	40	30	20	0
¹ The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.				

Table 18 Maximum fertilisation rates of nitrogen on vegetable crops

Crop	Nitrogen Index				Maximum additional supplementation (top dressing)
	1	2	3	4	
	Available Nitrogen (kg/ha)				
Asparagus (Establishment)	140	115	95	70	
Asparagus (After harvest))	100	100	100	100	
Broad Beans	0	0	0	0	
French Beans	90	85	75	70	
Beetroot	140	125	105	90	
Brussels Sprouts	120	115	105	100	180
Spring Cabbage	50	35	15	0	250
Other Cabbage	150	135	115	100	100
Broccoli	120	110	100	90	20
Cauliflower (Winter & Spring)	75	50	25	0	150
Cauliflower (Summer & Autumn)	120	80	40	0	120
Carrots	90	75	55	40	
Celery	120	85	65	50	180
Courgettes	140	125	105	90	
Leeks	100	90	80	70	100
Lettuce	100	90	80	70	50
Onions	70	60	50	40	70
Scallions	90	80	70	60	60
Parsley	100	80	60	40	150
Parsnip	100	85	70	50	50
Peas (Market)	0	0	0	0	
Rhubarb	100	90	80	70	200
Spinach	140	125	105	90	100
Swede (Horticultural)	70	45	25	0	
Swede (Transplanted crops)	80	52	29	0	

Table 19 Maximum fertilisation rates of phosphorus on vegetable crops

Phosphorus Index				
Crop	1	2	3	4
	Available Phosphorus (kg/ha)			
Asparagus (Establishment)	40	25	15	10
Asparagus (Maintenance)	27	17	10	7
Broad Beans	60	45	35	20
French Beans	60	45	35	20
Beetroot	60	45	35	20
Brussels Sprouts	60	45	35	20
Spring Cabbage	60	45	35	20
Other Cabbage	60	45	35	20
Broccoli	60	45	35	20
Cauliflower (Winter & Spring)	60	45	35	20
Cauliflower (Autumn)	60	45	35	20
Carrots	60	45	35	20
Celery	88	65	55	28
Courgettes	60	45	35	20
Leeks	60	45	35	20
Lettuce	60	45	35	20
Onions	60	45	35	20
Scallions	60	45	35	20
Parsley	60	45	35	20
Parsnip	60	45	35	20
Peas (Market)	60	45	35	20
Rhubarb	60	45	35	20
Spinach	60	45	35	20
Swede	70	60	45	35

¹ The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.

Table 20 Annual maximum fertilisation rates of nitrogen on fruit / soft fruit crops

	Available Nitrogen (kg/ha)
Apples (Dessert)	125
Apples (Culinary)	125
Pears	50
Cherries	70
Plums	70
Blackcurrants	80
Gooseberries	40
Raspberries	60
Strawberries	50
Redcurrants	60
Loganberries	50
Blackberries	50

Table 21 Annual maximum fertilisation rates of phosphorus on fruit/soft fruit crops

Crop	Phosphorus Index			
	1	2	3	4
	Available Phosphorus (kg/ha) ¹			
Apples (Dessert)	25	16	12	8
Apples (Culinary)	20	12	10	8
Pears	16	8	4	0
Cherries	16	8	4	0
Plums	16	8	4	0
Blackcurrants	20	16	12	8
Gooseberries	20	16	12	8
Raspberries	20	16	12	8
Strawberries	16	8	4	0
Redcurrants	20	16	12	8
Loganberries	20	16	12	8
Blackberries	20	16	12	8

¹ The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.