

Accounting for the nutrients in organic manures

1. Why?
2. On farm vs imported organic manure
3. Value of Organic Manures
4. Value of incorporated straw
5. Balancing the fields requirements
6. Issues with application rates
7. Correspondence with Department at end of year

Why Account for the nutrients?

“Organic manures bring many benefits to tillage land especially to winter cereal grown in a crop rotation with break crops”

- ▶ More consistent crop yields over time;
- ▶ Potential savings in bag fertiliser and
- ▶ Increasing the farms profitability.

Why Account for the nutrients?

- ◆ A good source of organic matter (Humus) which is beneficial in terms of improving soil structure;
- ◆ Secondly, regular manure applications will improve the biological activity in the soils and help improve the cycling and release of nutrients in soils and
- ◆ Thirdly, organic manures supply Major and Minor nutrients such as N, P, K plus sulphur, magnesium and trace elements which replenish soil reserves and contribute to meeting crop requirements.

Why Account for the nutrients?



STATUTORY INSTRUMENTS.

S.I. No. 605 of 2017

EUROPEAN UNION (GOOD AGRICULTURAL PRACTICE FOR
PROTECTION OF WATERS) REGULATIONS 2017

- To complying with current “Nitrates” rules (SI 605 of 2017);

- To minimise the impact on the environment and water quality



Sources of organic manures inside the farm gate:

1. Own or Contract rearing
livestock;



2. B and B of cattle or
sheep on catch crops;

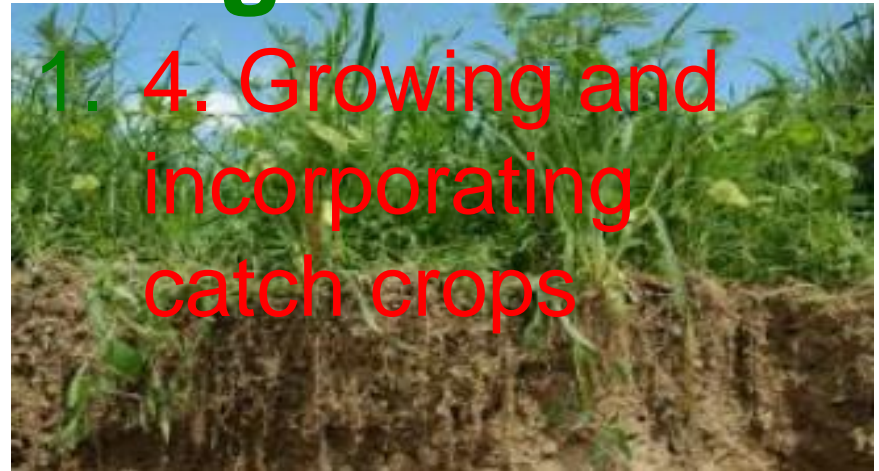


Sources of organic manures inside the farm gate:

3. Chopped straw or
oil seed rape haulm



1. 4. Growing and
incorporating
catch crops



5. Ploughed in beet
tops



Nutrient managing planning

1. Soil sample

▶ 5 ha

▶ Map

2. Crops and Ha.

3. Crop rotation

▶ N Index

4. Previous years stock and meal



Table 10 Determining nitrogen index for tillage crops

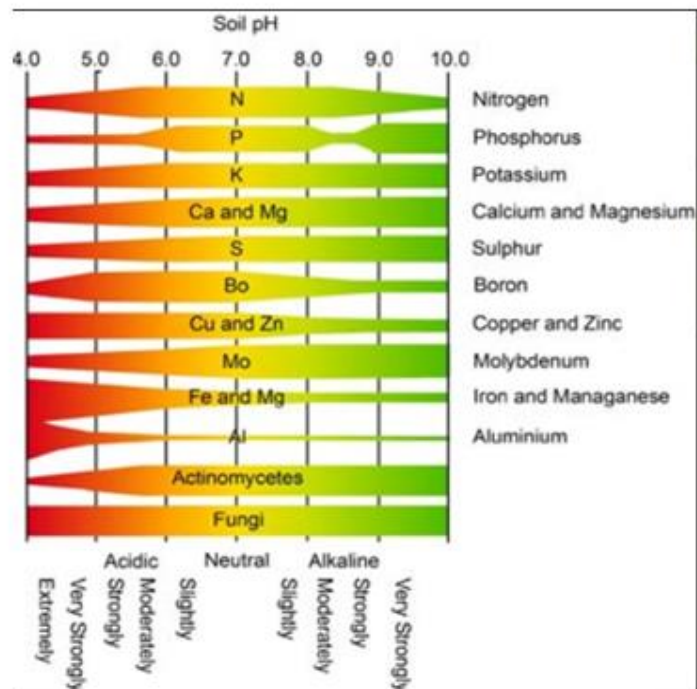
Tillage crops that follow permanent pasture			
Nitrogen Index			
Index 1	Index 2	Index 3	Index 4
The 5th tillage crop following permanent pasture. For subsequent tillage crops use the continuous tillage table.	The 3rd or 4th tillage crop following permanent pasture. If original permanent pasture was cut only, use index 1.	The 1st or 2nd tillage crop following permanent pasture (see also Index 4). If original permanent pasture was cut only, use index 2.	The 1st or 2nd tillage crop following very good permanent pasture which was grazed only.
Continuous tillage: — crops that follow short leys (1-4 years) or tillage crops			
Previous crop			
Index 1	Index 2	Index 3	Index 4
Cereals Maize	Sugar beet Fodder beet Potatoes Mangels Kale Oil seed rape, Peas, Beans		
	Leys (1-4 years) grazed or cut and grazed.		

Guided by soil test results:

Nutrients Test Results			Laboratory Results				
Ident	Field/NMP	Crop	pH	P		K	
				mg/l	Index	mg/l	Index
IAN/131-(5)	1	Feeding Barley - Winter	6.2	2.3	1	65.0	2
IAN/132-(5)	2	Feeding Barley - Winter	7.0	4.9	2	70.6	2
IAN/133-(5)	3	Feeding Barley - Winter	6.1	3.2	2	91.4	2
IAN/134-(5)	4	Feeding Barley - Winter	6.8	5.1	2	63.5	2
IAN/135-(5)	5	Feeding Barley - Winter	7.1	4.7	2	59.8	2
IAN/136-(5)	6	Feeding Barley - Winter	7.5	7.4	3	90.1	2
IAN/137-(5)	7	Feeding Barley - Winter	6.5	5.8	2	113.0	3
IAN/138-(5)	8	Feeding Barley - Winter	6.2	3.0	2	77.1	2
IAN/139-(5)	9	Feeding Barley - Winter	6.4	3.8	2	47.5	1



Table 1. Soil P and K Index system and corresponding soil test range (ppm)



P Index		
Index 1	Very low	0-3ppm
Index 2	Low	3.1-5ppm
Index 3	Target	5.1-8ppm
Index 4	Sufficient/ High	>8.1ppm

K Index		
Index 1	Very low	0-50 ppm
Index 2	Low	51-100 ppm
Index 3	Target	101-150 ppm
Index 4	Sufficient/ High	>151ppm

Soil index	Grassland	Tillage
Phosphorous (index 1 & 2)	61%	59%
Phosphorous (index 3 & 4)	39%	41%
Potassium (index 1 & 2)	54%	47%
Potassium (index 3 & 4)	46%	53%

Total vs Available Nutrients P and K

P:

- 100% available on Index 3
- 50% available on Index 1 & 2

K:

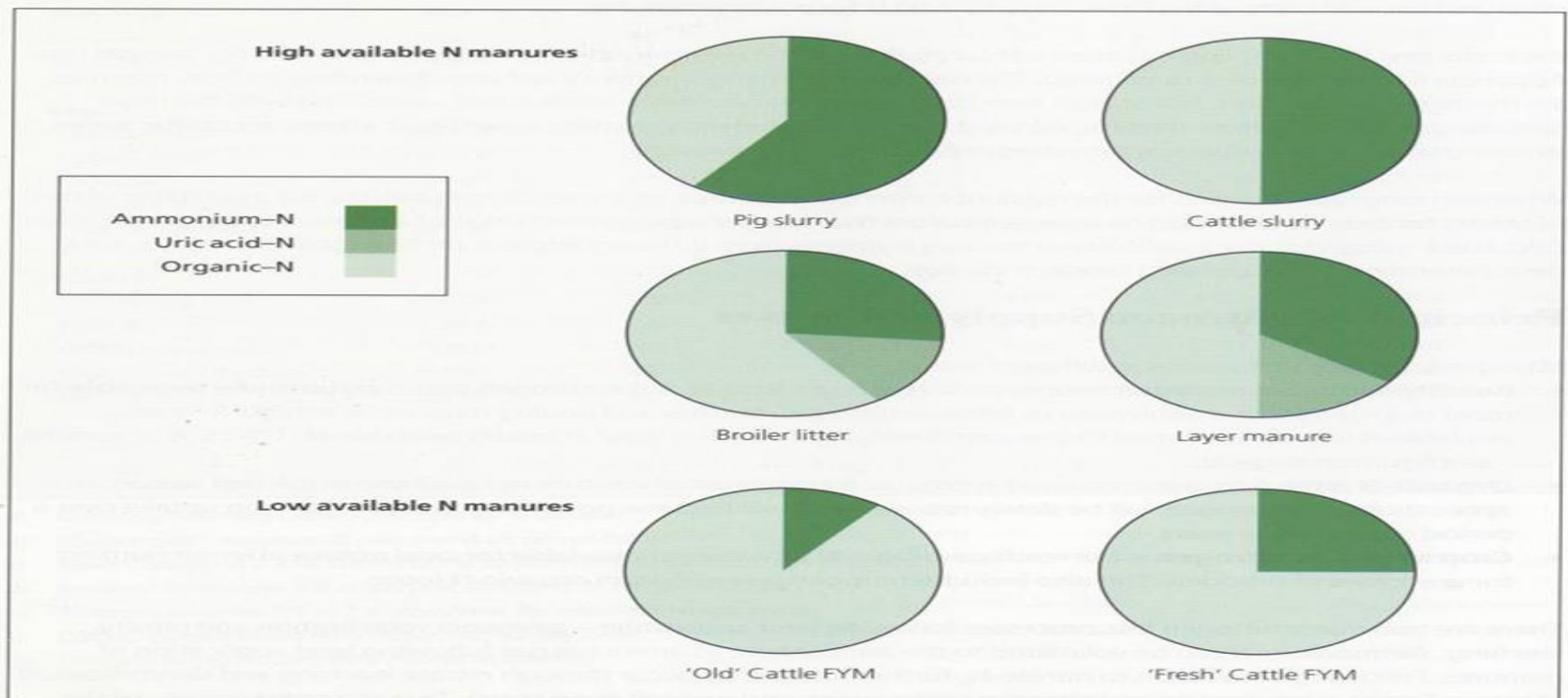
- 100% available on Index 3
- 90% available on Index 1 & 2
- No losses to air
- Both are tightly bound to soil
 - Therefore they are captured as soon as they are released from the organic manure
- P & K from organic manures can effectively substitute chemical fertiliser

Savings to be made in reduction in bag fertilisers

Total vs Available N

Nitrogen availability is highly variable, and can often be relatively low
Consider the weather when spreading high available N manures like Urea

Typical Proportions of Different Forms of Nitrogen in Farm Manures



Nutrient Availabilities for Organic Manures

Fertiliser	Availabilities (%)		
	Nitrogen	Phosphorus	
		Soil Index 1 & 2	Soil Index 3 & 4
Chemical	100	100	100
Pig & Poultry	50	50	100
FYM	30	50	100
SMC	20	50	100
Cattle & other livestock manures	40	50	100
Sludge's*	40	50	100
* Local CC different N & P availabilities depending on sludge type			

Organic Manures – Total Nutrient Content

Manure Type	Total N (kg/m ³)	Total P (kg/m ³)	Total K (kg/m ³)
Cattle Slurry	5.0	0.8	3.2
Pig Slurry	4.2	0.8	2.2
Sheep	10.2	1.5	5.4

Total Nutrient Content per 1 tonne

Manure Type	Total N (kg/t)	Total P (kg/t)	Total K (kg/t)
Poultry			
Broiler/deep litter	11	6	12
Poultry layers (30%DM)	13.7	2.9	6
Poultry layers (55%DM)	23	5.5	12
FYM	4.5	1.2	6
SMC	8	1.5	8.8

Is there a limit to the quantity of organic manures that I can import on to my farm on a yearly basis?

- ◆ Application rates set at *170kg Organic N/ha limit but watch soil P levels also*

Manure Type		Total N (kg/m ³)	ton/ha
Cattle Slurry		5.0	34
Pig Slurry		4.2	40.5
Manure Type		Total N (kg/t)	ton/ha
Poultry	Broiler / deep litter	11	15.45
	Poultry layers (30%DM)	13.7	12.4
	Poultry layers (55%DM)	23	7.39
Dung stead manure		3.5	48.5
FYM		4.5	37.7
SMC		8	21.25



Manure Fertiliser Replacement Value

Manure Type	Available Nutrients (units/1,000 or tonne)			
	N	P	K	Value (€€..)
Pig slurry (4 % DM)	19	7	20	€24/1,000gal
*Cattle Slurry (7 % DM)	18	7	32	€28/1,000gal
FYM	2.7	2.4	12	€8/t
Broiler Manure	28	12	36	€39/t
Layer manure	23	11	24	€31/t
SMC	3	3	17	€11/t
<p>N 0.94c/kg, P €1.99/kg, K 0.76c/kg</p> <p>Test manures to determine actual N, P & K values. Low emission increase slurry N by 3 units / 1,000 gals</p> <p>*Cattle Slurry based on SI N values. Actual value is 6 units / 1,000 gallons Spring Splash Application</p>				

Source:- Mark Plunkett, Teagasc

Manure Fertiliser Replacement Value

Manure Type	Available Nutrients (kg / m ³ or tonne)			
	N	P	K	Value (€€..)
Pig slurry (4% DM)	2.1	0.8	2.2	€4.6 m ³
*Cattle Slurry (7% DM)	2.0	0.8	3.5	€6.1 m ³
FYM	1.35	1.2	6	€8 ton
Broiler Manure	14	8	18	€39 ton
Layer manure (55% DM)	11.5	5.5	12	€31 ton
SMC	1.6	1.5	8	€11 ton
<p><i>Nutrient Values :- N = 0.94c/kg, P = €1.99/kg, K = 0.76c/kg</i></p> <p><i>Test manures to determine actual N. P & K values. Low emission application increases N by 0.4kg/m³</i></p> <p><i>*Cattle Slurry based on SI N values. Actual value is 0.4 kg/m³ Spring Splash Application</i></p>				

Source:- Mark Plunkett, Teagasc

Value of chopped straw – P & K

Crop	Crop Yield (t/ha) (t/ac)	P Kg/ha	K Kg/ha	Value €/ha (/ac.)
Winter Oilseed rape	5.0 (2.0)	2.2 (€4.73)	25 (€16)	€21 (€8.34)
Winter Oats	9.0 (3.6)	3.6 (€7.7)	87 (€56)	€63 (€25)

CAN @ €225 O/7/30 @ €345 N - €0.81kg, P - €2.15kg, K- €0.64kg

Reduce P and K requirements by 20% following straw incorporation

Higher K off takes in green rare straw

Suggested Fertiliser Programme Winter Wheat

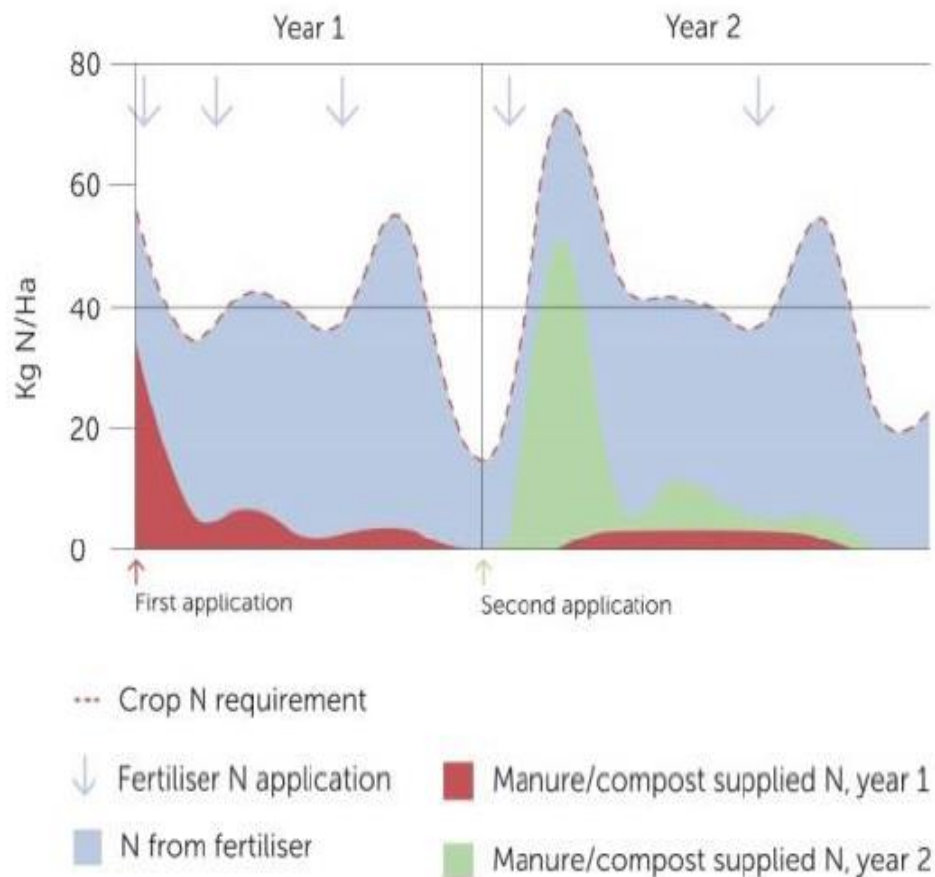
N, P & K advice (kg/ha) for Winter Wheat
Target yield 11t/ha Soil Index 2 for P and Soil Index 1 for K
last years straw from a 9t./ha. winter oaten chopped

	N kg / ha	P kg / ha	K kg / ha	
Crop requirements	250	52	140	Planned programme
Value of chopped oaten straw 9t/ha		1.8	43	Maximum 50% available in year 1
5 t/ha mix (1t Layers 55% dm : 4 t SMC – Autumn applied	19	11.5 (5.7)	44	Nitrogen 100% available? P @ 50% available (P index 2) Nitrogen will help straw break down
7.5 x 10/10/20	38	38	75	Compound applied late tillering GS 28-30
14.3 * 27% +/- S	193			Sulcan and Can applied at GS 31 & 37

Issues with over application:



GRAPH 1: MODELLING INTEGRATED NITROGEN (N) SUPPLY

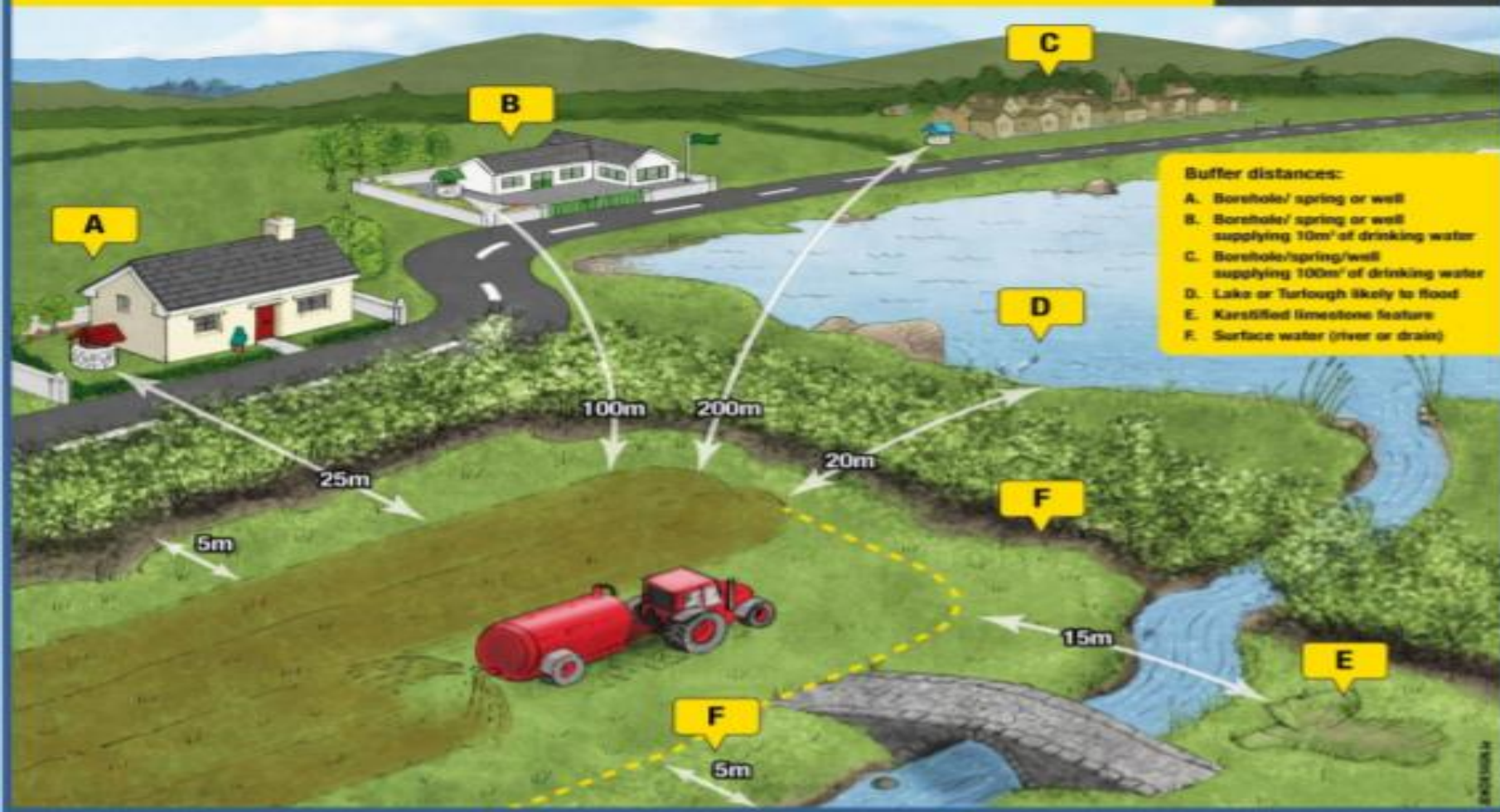


Good Agricultural Practice for the Protection of Waters

Buffer distances for the landspreading of organic fertiliser/ soiled water



Leitrim County Council
Comhairle Chontae Uallroma

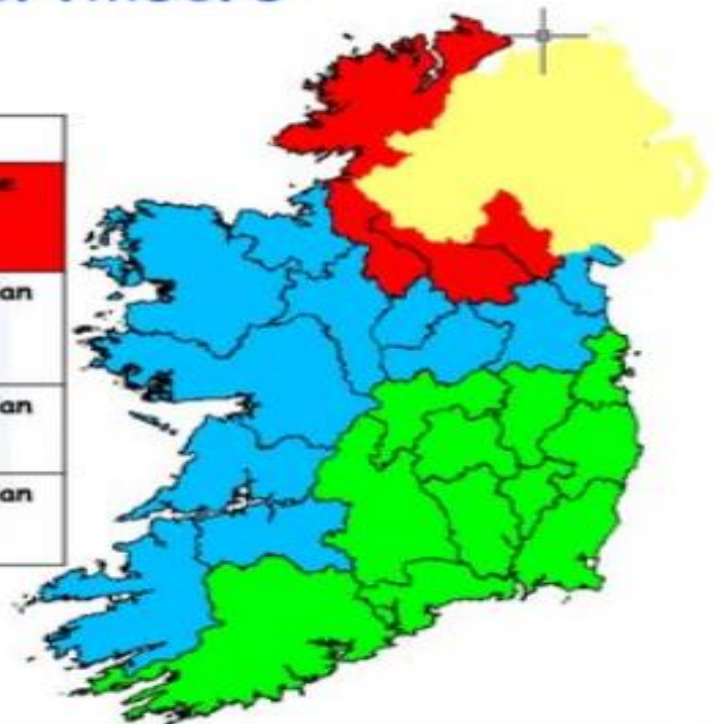


Regulation 605 Of 2017 prescribe for a doubling of the buffer distance from 5m to 10m from any surfaces waters for the two weeks preceding and two weeks after the closed period



Prohibited application periods for fertilisers

Fertiliser type	Start date	Prohibited application period		
		Zone A	Zone B	Zone C
Chemical	15 Sept to	12 Jan	15 Jan	31 Jan
Organic	15 Oct to	12 Jan	15 Jan	31 Jan
Farmyard Manure	1 Nov to	12 Jan	15 Jan	31 Jan



Movement of organic manure and livestock

RECORD 3 - RECORD OF MOVEMENT OF LIVESTOCK MANURES¹

Movement forms must be submitted before the end of each year i.e. details of exports which occur in 2018 must be submitted on this form by 31.12.2018

PLEASE COMPLETE AND RETURN FORM TO: Nitrates Section, Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Wexford Y35 PN52, OR email to nitrates@agriculture.gov.ie (if emailing, **do not** send a copy by post). PLEASE NOTE: The only acceptable proof of postage will be Express Post Receipt or Registered Post Receipt.

IMPORTER(S) PLEASE NOTE: All importer details must be supplied. **Importer breach of the 170kg limit N/ha/year may be liable to penalty.** If the importer does not have a herd number, the area and LPS number OR a map with adjacent LPS number of the area question will be required.

Date of movement 2018	Type of fertiliser from Tables 7 and 8 of the Regulations (e.g. cattle or pig slurry)	Nutrient content of fertiliser (from Tables 7 or 8)		Quantity moved (m ³ , litres, gallons, kg, specify units used)	Total N kg	Total P kg	Confirmation that details of movement are correct	
		N kg/m ³	P kg/m ³				EXPORTER	IMPORTER(s) (List if more than one importer)
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
Total N and P in Livestock Manures moved (kgs)								

¹ A copy of this record must be maintained by both the exporter and importer. The "exporter" is the farmer sending Livestock Manures out of his/her holding. The "importer" is the farmer taking it in.

RECORD 4: Notification of Temporary Movement of Cattle or Sheep
[other than cattle moved under AIMS, sheep moved under normal procedures]
 The Nitrates Regulations have implications for farmers moving their animals (cattle and sheep) to another holding for grazing on a temporary basis. Farmers can obtain nitrates credit for the temporary movement of cattle and sheep by completing the Record 4. The rules applying for the notification of movement of cattle and sheep are stated overleaf.

Completed form to be forwarded to: Dept of Agriculture, Food and the Marine, Nitrates Section, Johnstown Castle Estate, Wexford Y35 PN52 on or before 31st December 2018 or emailed to nitrates@agriculture.gov.ie (if emailing, **DO NOT** send a copy by post). PLEASE NOTE: the only acceptable proof of postage will be Express Post Receipt or Registered Post Receipt.

Owner of holding **from** which animals moved: _____ Herd Number: _____
 Name: _____ Address: _____

Owner of holding **to** which animals moved: _____ Herd Number: _____
 Name: _____ Address: _____

LPS Numbers of Land plots to which animals moved: _____

CATTLE Movements - Number of Cattle Moved: _____

Date of movement out: _____ Date of movement back: _____

Tag numbers of Cattle moved: (use extra sheet if necessary)

Signature of Owner/Keeper of holding **from** which animals moved: _____ Date: _____

Signature of Owner/Keeper of holding **to** which animals moved: _____ Date: _____

Pig and Poultry Manure imported after the commencement of the closed period until 31st December will be considered inventory for the following year. **IMPORTER(S) PLEASE NOTE:** All importer details must be supplied. **Importer breach of the 170kg limit N/ha/year may be liable to penalty.** If the importer does not have a herd number, the area and LPS number OR a map with adjacent LPS number of the area question will be required.

Date of movement 2018	Type of fertiliser from Tables 7 and 8 of the Regulations (e.g. cattle or pig slurry)	Nutrient content of fertiliser (from Tables 7 or 8)		Quantity moved (m ³ , litres, gallons, kg, specify units used)	Total N kg	Total P kg	Confirmation that details of movement are correct	
		N kg/m ³	P kg/m ³				EXPORTER	IMPORTER(s) (List if more than one importer)
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
							Name:	Name:
							Herd No:	Herd No:
							Signature:	Signature:
Total N and P in Livestock Manures moved (kgs)								

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Thanks You.....

QUESTIONS PLEASE