Nutrient Status

Manure and Slurry – Cattle

NRM has conducted a recent review of agricultural manures and slurries going back to January 2011 to identify the mean values and variation in nutrient content. We have also investigated the potential financial value of a typical manure/slurry within each category. This review has used customer results over this period that have been analysed for the standard manure analysis packages. These samples are from throughout the UK covering many different farming practices within each category. The categories chosen are a selection of those highlighted in RB209 as types of organic fertilisers.

The purpose of this review is to highlight the possible variation there is in nutrient value and see how this translates to the value of the material when it is spread to land. The variation in nutrients for each material can highlight the importance of getting this material tested so that it can be used in the most efficient way, saving land managers money on fertiliser application or ensuring that enough additional fertiliser is applied if manure values are low.

The full report can be found on the NRM website - **http://www.nrm.uk.com/downloads.php**

This document focuses on cattle manures and slurry and provides a brief summary of variation in financial and nutrient value for each material. With the use of current fertiliser prices and using the mean nutrient values we have produced a spreading scenario to show what the financial savings could be in a real life situation. This has been done with the use of the MANNER-NPK[1] software and takes into account a number of factors when it comes to spreading the material.

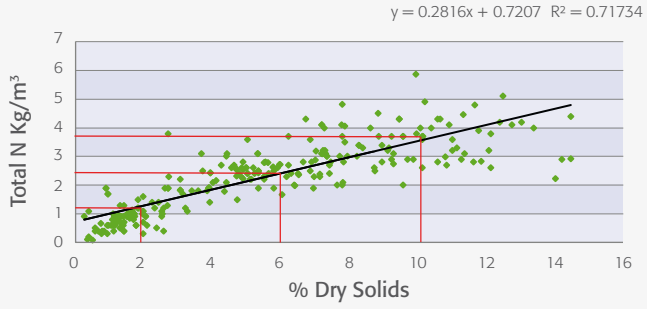
Variation in Financial Value and nutrients of Cattle FYM

Manure	N					P			K		
Cattle FYM	Nitrogen (Kg/t)	NH_4-N (Kg/t)	N Efficiency %	Crop Available N	£ / tonne	P_2O_5 (Kg/t)	Crop Available P_2O_5	£ / tonne	K_2O (Kg/t)	Crop Available K	£ / tonne
Mean	6.15	0.51	8	0.49	0.29	3.43	2.06	1.99	8.77	7.89	3.33
Max	32.60	5.58	12	3.85	2.23	21.88	13.13	12.69	35.04	31.54	13.31
Min	1.34	0.01	5	0.06	0.04	0.54	0.32	0.31	0.24	0.22	0.09

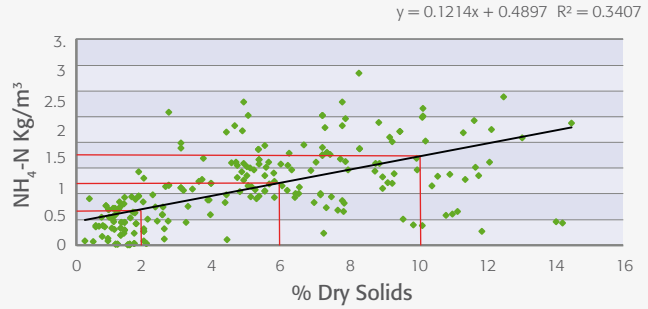
Variation in nutrients of Cattle Slurry

Providing variations in financial values of slurry would be very misleading as % dry solids needs to be taken into account. Further details on this can be found in the full report. The charts below show the wide variation that there can be in this material.

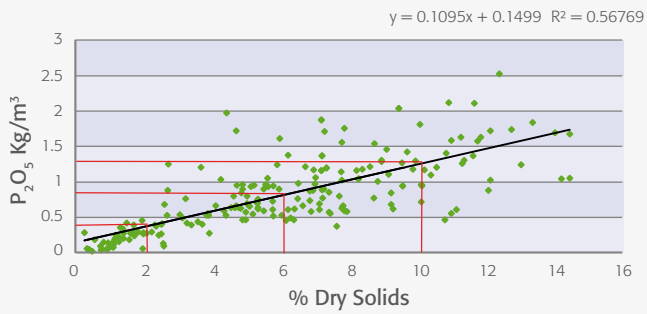
Cattle Slurry Total Nitrogen



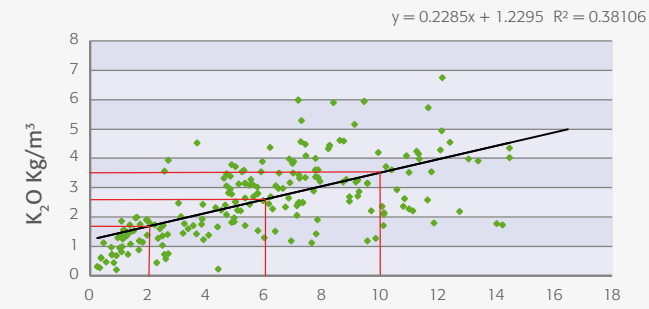
Cattle Slurry NH_4-N



Cattle Slurry P_2O_5



Cattle Slurry K_2O



Cattle FYM Spreading Scenario

Potential financial value of Manure application **£141/ha**

Application details

Manure type	Cattle FYM fresh
Cropping	Grass 2 cut
Application date	15/02/2016
Application rate (t/ha or m^3/ha)	25
Application method	Broadcast spreader
Method of soil incorporation	Not Incorporated

Manure analysis (using Cattle FYM mean values)

DM (%)	Kg/t	23.9
Total N		6.15
NH_4-N		0.51
Nitrate – N		0
Total P_2O_5		3.43
Total K_2O		8.77

Nitrogen in Application

		Nitrogen losses (kg/ha)			Crop available N (kg/ha)			
Total N (kg/ha)	Mineralised N (kg/ha)	Nitrate-N	Ammonia-N	Denitrified-N	Current crop	Next Grass Crop Current year	Following crop year 2	N use efficiency (%)
154	1	0	9	0	6	9	5	9

P & K in Application

Total P_2O_5 (Kg/ha)	Available P_2O_5 (kg/ha)	Total K_2O (kg/ha)	Available K_2O (kg/ha)
86	51	219	197

Financial Value

Crop available N (£/ha)	£8
Total P_2O_5 (£/ha)	£49
Total K_2O (£/ha)	£84
Grand total (£/ha)	**£141**

[1] MANNER-NPK Version 1.0.1 2013

* Based on 58p/kg N, 58p/kg P_2O_5 & 38p/kg K_2O
Assumed soil index values: P ≤ 2, K ≤ 2+

Cattle Slurry Spreading Scenario

Potential financial value of Manure application **£124/ha** (10% Dry Solids)

Application details

Manure type	Cattle Slurry
Cropping	Winter Wheat
Application date	15/09/2015
Application rate (t/ha or m^3/ha)	50
Application method	Band Spreader – Trailing Shoe
Method of soil incorporation	Plough

Manure analysis (using Cattle Slurry mean values)

DM (%)	kg/t	2	6	10
Total N		1.28	2.41	3.55
NH_4-N		0.77	1.17	1.56
Nitrate – N		0	0	0
Total P_2O_5		0.45	0.82	1.19
Total K_2O		1.73	2.51	3.28

Nitrogen in Application

			Nitrogen losses (kg/ha)			Crop available N (kg/ha)		
% Solids	Total N (kg/ha)	Mineralised N (kg/ha)	Nitrate-N	Ammonia-N	Denitrified-N	Current crop	Following crop year 2	N use efficiency (%)
2	64	1	8	3	3	26	1	41
6	120	3	14	6	4	37	2	31
10	178	4	19	11	5	47	3	27

P & K in Application

% Solids	Total P_2O_5 (Kg/ha)	Available P_2O_5 (kg/ha)	Total K_2O (kg/ha)	Available K_2O (kg/ha)
2	22	11	86	86
6	41	20	125	113
10	60	30	164	148

Financial Value

	2% Solids	6% Solids	10% Solids
Crop available N (£/ha)	£15	£22	£27
Total P_2O_5 (£/ha)	£13	£24	£34
Total K_2O (£/ha)	£33	£48	£63
Grand total (£/ha)	**£61**	**£93**	**£124**

[1] MANNER-NPK Version 1.0.1 2013

* Based on 58p/kg N, 58p/kg P_2O_5 & 38p/kg K_2O
Assumed soil index values: P ≤ 2, K ≤ 2+

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