Handout 1: Nutrient Planning

Various ways to keep records but keeping a **diary record** of manure, fertiliser, and lime applications is a good base level of information.

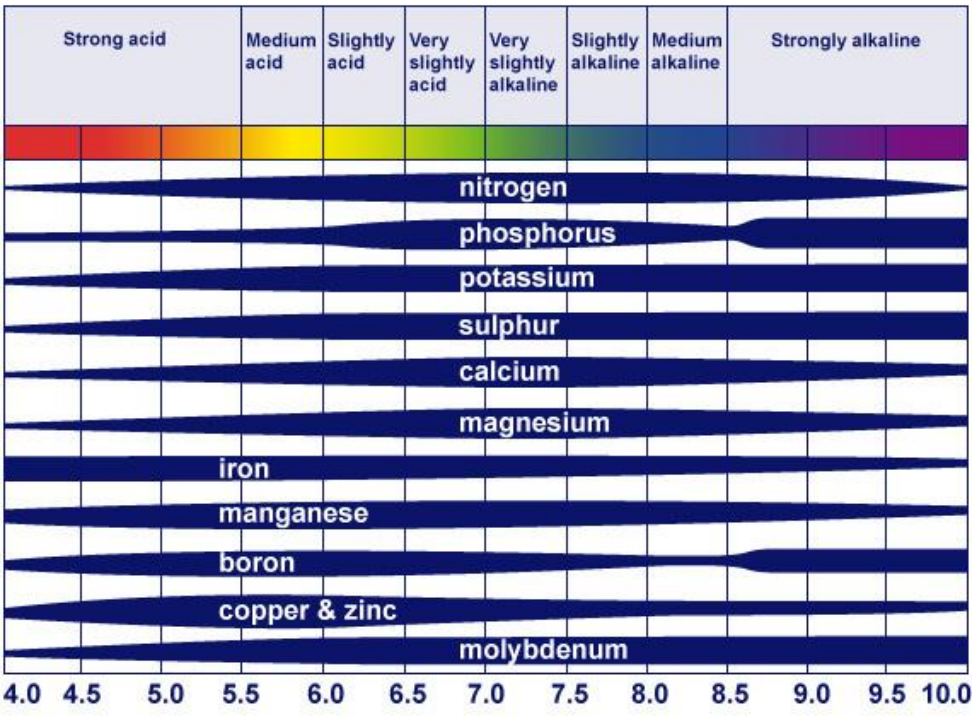
Nutrient planning needs to be based on:

1. Soil test results – sample quarter of farm each year
2. Previous cropping
3. Applications of manure – how much, when, and how it was spread
4. Clover content
5. Top-up applications of bagged fertiliser

Understanding soil analysis results:

Field number	PH	Phosphate	Potassium	Magnesium
Target for productive grassland	5.9 - 6.2 (peat 5.5)	2	2-	2
Target for species-rich grassland	variable	0 - 1	1 – 2-	2
1	5.8 slightly low	2 target	2- target	2 target
2	6.6 excess	3 excess	2+ excess	2 target
3	6.3 target	3 excess	2- target	2 target
4	6.1 target	2 target	1 slightly low	2 target
5	5.5 low	3 excess	2+ excess	2 target
6	5.7 slightly low	1 slightly low	1 slightly low	2 target

The importance of lime:

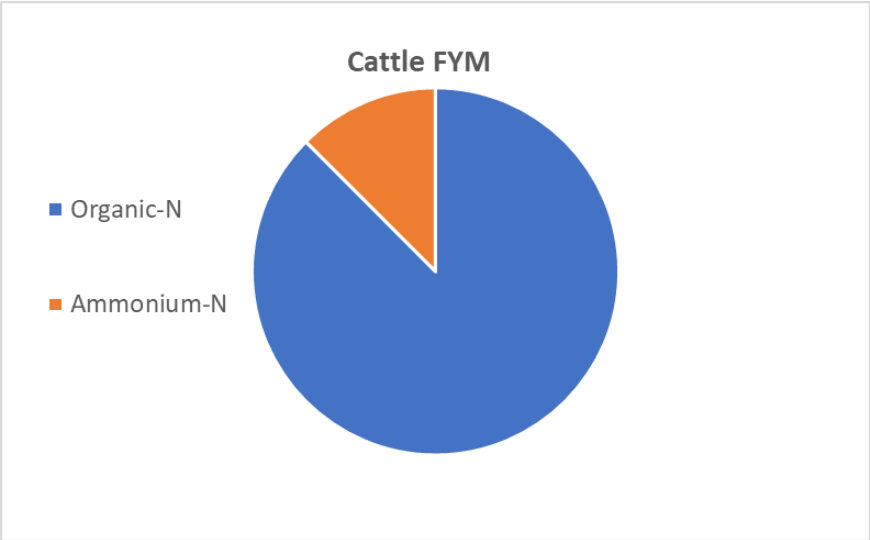


Nutrients available from manure (for slurry, 1 tonne = 1 cubic metre):

	N	% available	P	% available	K	% available	Sulphur	% available
FYM 25% DM	6 kg/t	10%	3.2 kg/t	60%	9.4 kg/t	90%	2.4 kg/t	5-15%**
Slurry 6% DM	2.6 kg/t	25-35%*	1.2 kg/t	50%	2.5 kg/t	90%	0.7 kg/t	35%**
Slurry 10% DM	3.6 kg/t	20-25%*	1.8 kg/t	50%	3.4 kg/t	90%	1.0 kg/t	35%**
Dirty water (strainer box) 1.5% DM	1.5 kg/m³	30-45%*	0.3 kg/m³	50%	1.5 kg/m³	90%	No data	-

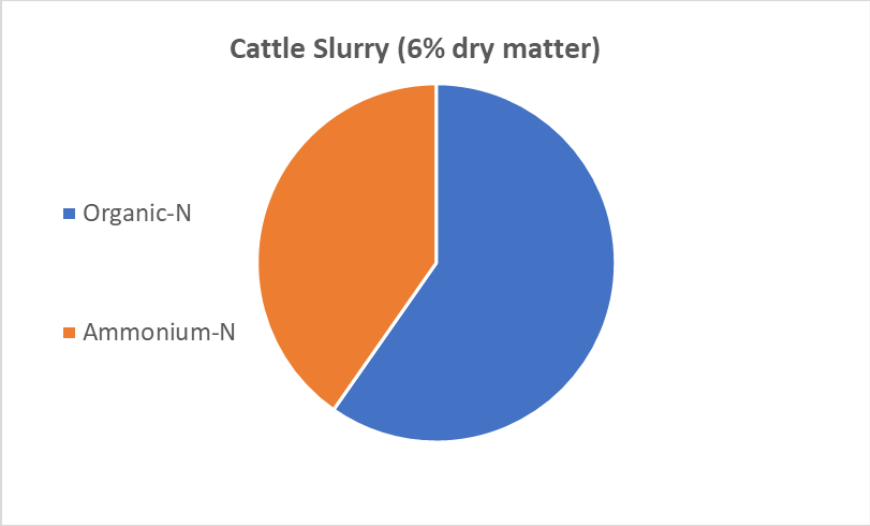
***BUT only 5-10% available if spread in autumn on sandy or shallow soil**

****** Spring applications have higher % of sulphur available**



Ammonium-N is the portion that is instantly available. Easily lost to the air or leached from the soil.

Organic-N becomes available over months or years.



Nitrogen fertiliser uptake efficiency is typically 55-70%.

Crop diet for a grazing field (to convert kg/ha to units per acre, multiply by 0.8):

		N	P	K	Sulphur	pH
Soil index		Moderate SNS	1	1		5.5
Nutrients needed for crop	Grazing only	80 kg/ha	50	30	25	Target = 6.2
What has been applied in manure since end of last growing season?	20 t/ha 25% DM FYM	6 kg/t	3.2 kg/t	9.4 kg/t	2.4 kg/t	
		120 kg/ha	64 kg/ha	188 kg/ha	48 kg/ha	
How much of that manure is AVAILABLE?	Broadcast application in March	10%	60%	90%	15%	
		12 kg/ha	38 kg/ha	170 kg / ha	7 kg / ha	
Clover cover	0%	-	-	-	-	
What is needed from bagged fertiliser / lime?		68 kg/ha 54 units/ac	12 kg/ha 10 units/ac	-	18 kg/ha 14 units/ac	4 t/ha 1.5 t/ac

Crop diet for 2 cuts silage:

		N	P	K	Sulphur	pH
Soil index		Moderate SNS	1	1		5.5
Nutrients needed for crop	1st cut 2nd cut	80 kg/ha 50 kg/ha	70 25	(30)80 kg/ha 100	40 40	Target = 6.2
What has been applied in manure since end of last growing season?	20 t/ha 25% DM FYM	6 kg/t	3.2 kg/t	9.4 kg/t	2.4 kg/t	
		120 kg/ha	64 kg/ha	188 kg/ha	48 kg/ha	
How much of that manure is AVAILABLE?	Broadcast application in March	10%	60%	90%	15%	
		12 kg/ha	38 kg/ha	170 kg / ha	7 kg / ha	
Clover cover	25%	180 kg/ha	-	-	-	
What is needed from bagged fertiliser / lime?		-	57 kg/ha 46 units/ac	40+60 kg/ha 32+48 u/ac *	73 kg/ha 58 units/ac	4 t/ha 1.5 t/ac

*Extra potash needed as the index is below the target of 2-

Determining Soil Nitrogen Supply (AHDB Nutrient Management Guide):

Table 3.6 Determining the Soil Nitrogen Supply status of grassland

Previous management		Previous nitrogen use (kg/ha/yr)[a]	SNS status
Long-term grass. Includes:		Over 250	High
• Grass reseeded after grass or after one year of arable		100–250 or high clover content	Moderate[b]
• Grass ley in second or later year		Up to 100	Low
First year ley after two or more years of arable with previous crop	Potatoes, oilseed rape, peas or beans, NOT on light sand soil		Moderate[b]
	Cereals, sugar beet, linseed or any crop on a light sand soil		Low

a. Refers to typical fertiliser and available manure nitrogen used per year in the last 2–3 years
b. The nitrogen values in the recommendation tables assume a moderate Soil Nitrogen Supply (SNS) status and so adjustments need to be made for high or low SNS: increase total fertiliser nitrogen input by 30 kg/ha in a low SNS situation; decrease total fertiliser nitrogen input by 30 kg/ha in a high SNS situation. Increase SNS status by one class if more than 150 kg/ha of total nitrogen has been regularly applied as organic manure for several years. Reduce SNS status by one class if grass was cut for silage and less than 150 kg/ha of total nitrogen as organic manure has been applied on average in previous years.

Useful information:

Booklets and paper sources of info:

AHDB Nutrient Management Guide https://ahdb.org.uk/nutrient-management-guide-rb209

Nutrient planning software / apps:

Farm Crap App https://www.swarmhub.co.uk/the-farm-crap-app-pro/

PLANET nutrient management https://www.planet4farmers.co.uk/Content.aspx?name=PLANET

MANNER NPK https://www.planet4farmers.co.uk/Manner.aspx

Field Margin (commercial) https://fieldmargin.com/

Nutrient planning paper systems:

Tried and Tested https://www.nutrientmanagement.org/