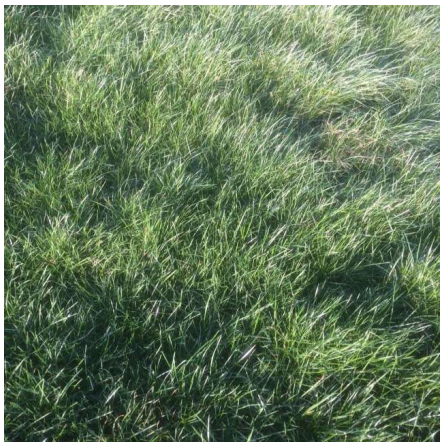
1

Phosphorus & Advice

2

P Deficiency in Grassland

Index 1



Index 3

3

Role & Function of Phosphorus (P)

- Soils & supply
- Rooting & Tillering
- Spring grass growth
- Extra 1.5t DM/ha
- 60% P recycled
- Milk/Meat – Off takes
- Animal health
- Peat soils (Index 3!)

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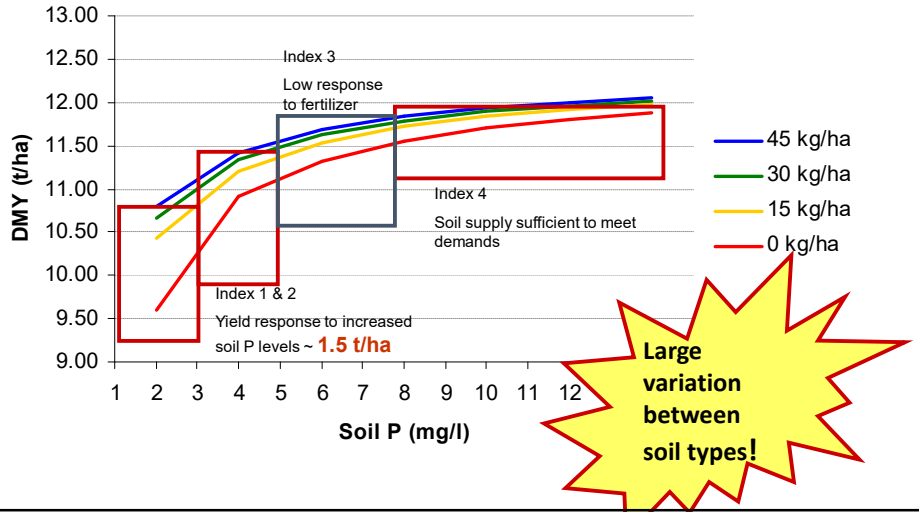
Why Build Soil Fertility?

Mean dry matter yield response to soil and fertilizer P (Schulte & Herlihy, 2007)



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Phosphorus (P) Quiz

Q 1. How much P removed in 1,000 litres of milk?	Q 2. How much P is required to grow 1 ton Grass DM?
Answer A – 5kg/ 1,000 litres B – 1 kg / 1,000 litres	Answer A – 10kg / t DM B – 4 kg / t DM
Q 3. When is the best time to apply P?	**Q 4. Is cattle slurry high or low in P?**
Answer A – Springtime B – Summer time	Answer A – High B – Low

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Phosphorus (P) Quiz Ans

Q 1. How much P removed in 1,000 litres of milk?	Q 2. How much P is required to grow 1 ton Grass DM?
Answer B – 1 kg / 1,000 litres	Answer B – 4 kg / t DM
Q 3. When is the best time to apply P?	**Q 4. Is cattle slurry high or low in P?**
Answer A – Springtime	Answer B – Low

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Phosphorus Build Up

For grassland farms stocked above 130kg organic N/ha

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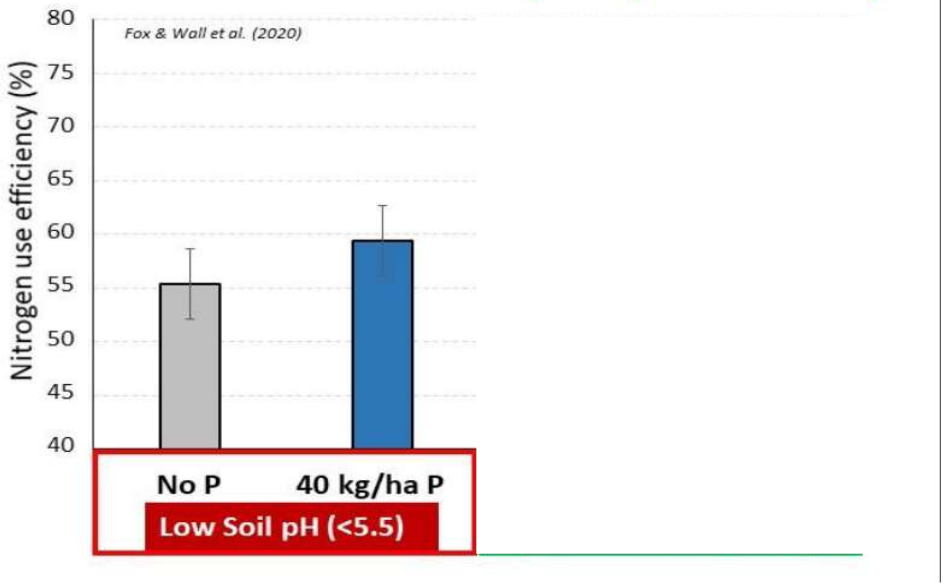
Increased nutrient efficiency at optimum soil pH



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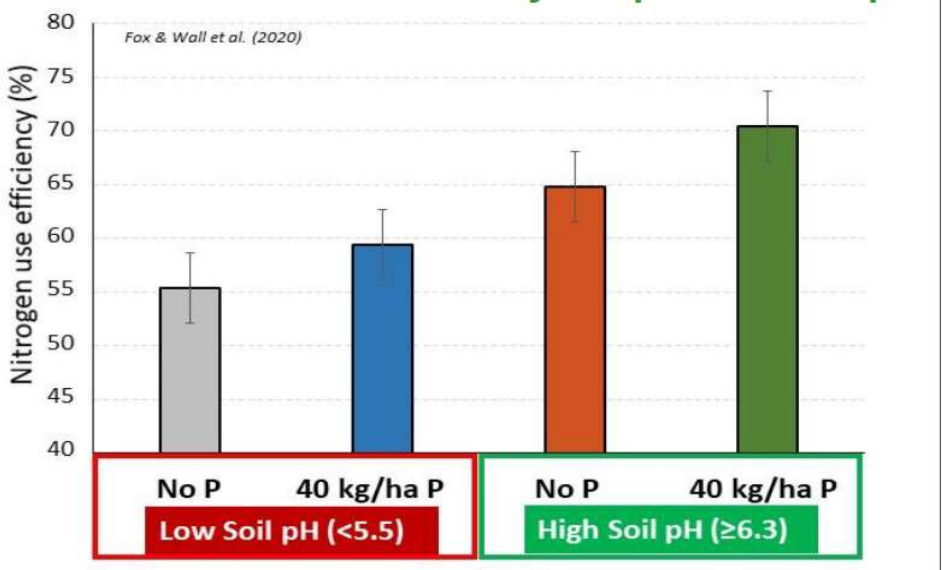
Increased nutrient efficiency at optimum soil pH



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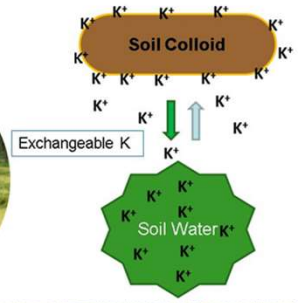
Potassium (K)



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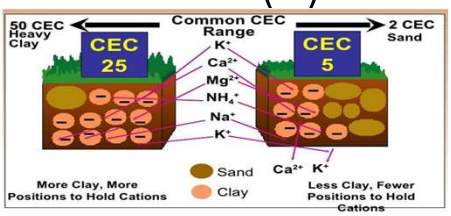
Role & Function of Potassium (K)

- Soils & supply
- N uptake & efficiency
- Similar uptake to N
- K easily leached
- Majority K recycled (90%)
- Silage & off-takes
- Slurry role & K return



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Potassium (K) Quiz

Q 1. How much K removed in 1,000 litres of milk?	Q 2. How much K is required to grow 1 ton Grass DM?
Answer A – 1.5kg/ 1,000 litres B – 10 kg / 1,000 litres	Answer A – 25kg / t DM B – 5 kg / t DM
Q 3. When is the best time to apply extra K for build-up?	**Q 4. Is cattle slurry high or low in K?**
Answer A – Springtime B – Autumn time	Answer A – High B – Low

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Potassium (K) Quiz - Answers

Q 1. How much K removed in 1,000 litres of milk?	Q 2. How much K is required to grow 1 ton Grass DM?
Answer A – 1.5kg/ 1,000 litres	Answer A – 25kg / t DM
Q 3. When is the best time to apply extra K for build-up?	**Q 4. Is cattle slurry high or low in K?**
Answer B – Autumn time	Answer A – High

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Fertiliser Advice for Grass Silage Crops

Recommended rates of K for 1st, 2nd & 3rd cut grass silage				
Soil Index	**1st Cut** *6 t/ha DM*	**2nd Cut** *3 t/ha DM*	**3rd Cut** *2 t/ha DM*	**Total K** *kg/ha (units/ac)*
1	210	75	50	**335 (268)**
2	180	75	50	**305 (244)**
3	150	75	50	**275 (220)**
4	0	0	0	**0**
On Index 4 soils omit K for one year and revert back to Index 3 advice until next soil test. Adjust K advice by +/- 25kg K/ha per tonne of grass DM.				

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Replace P & K removed in surplus grass!

- Each tonne of Grass DM removes
  - 4kg P/ha
  - 25kg K/ha

For example 2,000 kg Grass DM / ha removes:
- *8kg P/ha (6 units/ac)*
- *50 kg K/ha (40 units/ac)*

Need to replace P & K removed! =

- 1,500 gals/ac Cattle slurry (6% DM)

Or

- 2.0 bags/ac N-P-K:15-3-20

4 bales /ac

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How much P and K to replace offtake?

	P (kg)	K (kg)	
Milk (1,000 litres)	1	1 - 1.5	
Meat (Live wt.) (100 kg)	1	0.5 - 1	
Silage (1 ton DM)	4	25	

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How much P & K Removed?

5,000L / Cow

Stocking Rate / ha	Product	P (kg)	K (kg)
	10,000L Milk	10	15
	15,000L Milk	15	23
	20,000L Milk	20	30

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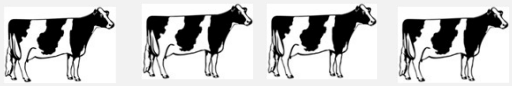
How much P & K Removed?

6,000L / Cow

Stocking Rate / ha	Product	P (kg)	K (kg)
	12,000L Milk	12	15
	18,000L Milk	18	27
	24,000L Milk	24	36

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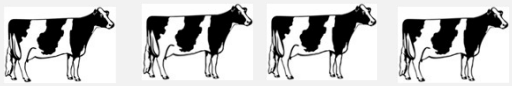
How much P & K Removed?

7,000L / Cow - Update

Stocking Rate / ha	Product	P (kg)	K (kg)
	14,000L Milk	14	21
	21,000L Milk	21	32
	28,000L Milk	28	42

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P & K advice – replacing offtake

Stocking Rate (LU/ha)		1.5-2.0	2.0-2.5	2.5-3.0	> 3.0
Dairy - Maintenance		**P – K advice**			
	kg/ha	14 – 30	19 – 35	23 – 40	27 – 45
Standard P Build-Up					
Build – Up	*Index 1*	*20 – 60*	*20 – 60*	*20 - 60*	*20 - 60*
	Index 2	*10 - 30*	*10 - 30*	*10 - 30*	*10 - 30*
Extra P Available					
Build – Up	*Index 1*	*50 – 60*	*50 – 60*	*50 - 60*	*50 - 60*
	Index 2	*30 - 30*	*30 – 30*	*30 - 30*	*30 - 30*

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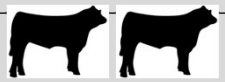
How much P & K Removed - Drystock?

Stocking Rate / ha	Product	P (kg)	K (kg)
	750kg Meat	7.5	7.5
	1500kg Meat	15	15
 X 10	500 kg Meat	5	5
 X 20	1,00kg Meat	10	10

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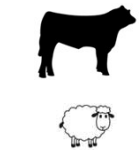
Drystock P & K advice – Offtake & Build-Up



Stocking Rate (LU/ha)		<1.5	1.5-2.0	2.0-2.5	2.5-3.0
Drystock - Maintenance		**P – K advice**			
	kg/ha	7 – 10	10 – 55	13 – 20	16 – 55
Standard P Build-Up					
Build – Up	*Index 1*	*20 – 60*	*20 – 60*	*20 - 60*	*20 - 60*
	Index 2	*10 - 30*	*10 - 30*	*10 - 30*	*10 - 30*
Extra P Available					
Build – Up	*Index 1*	*--*	*--*	*50 - 60*	*50 - 60*
	Index 2	*--*	*--*	*30 - 30*	*30 - 30*

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P & K Summary

- Target P & K Index 3
- Fertilise to grass yield potential
- Select suitable fertiliser N-P-K blend
- Soil P build-up will depend on soil type
- Watch K levels
- Recycle cattle to maintain soil K levels
- Build soil K levels in the Autumn

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Soil Test Results – P, K

est Results		Laboratory Results							N
Field/NMP	Crop	pH	P		K		OM	Other	LR
			mg/l	Index	mg/l	Index	%	*	t/ha
8	Good Permanent Grass	6.8	9.3	4	267.0	4			1.5
7	Good Permanent Grass	7.0	6.1	3	145.0	3			XSL
9	Good Permanent Grass	6.8	5.7	3	148.0	3			XSL
16	Good Permanent Grass	6.7	2.3	1	123.0	3			1.5
15	Good Permanent Grass	6.3	1.3	1	113.0	3			3.5
14	Good Permanent Grass	5.9	1.6	1	136.0	3			6.0

Nutrient Test Results - On Mineral Soil - Good Permanent Grass						Nutrient Advice - Assuming 22C Manure	
Soil Index							
Nutrient	Result	Very Low (1)	Low (2)	Medium (3)	Sufficient (4)	/ha	/ac
pH	5.9					6.00 t	2.4 t
N		S.R.160Kg OrgN/ha				153 kg	122 units
P	1.6 mg/l					27 kg	22 units
K	136.0 mg/l					0 kg	0 units
Mg							
SMP pH	6.2						
Soil Nutrient Supply		Very Low	Low	Medium	Sufficient		

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Group Soil P & K Results – Discuss

Farmers bring in there own soil test results & discuss

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Role & Function of Sulphur (S)

- Soils & supply
- N uptake & efficiency
  - DM prod
  - Clover
- Similar uptake to P
- Silage & Grazing

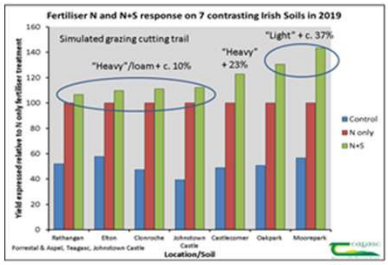

Fig. 2: Location of experimental sites, 1974 to 1984

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Utilising Major Cattle Slurry Nutrients

N – P – K

Organic fertilisers generated on farms can effectively replace a proportion of chemical fertilisers

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Nitrogen Sources

- **Straight N** ✖
  - Urea
  - Protected Urea ✖
  - CAN
  - **N +S** (3 to 14%)
- **Straights**
  - 16% P / 50% K
- **Blends**
  - 18-6-12 / 18-4-12
  - 29-0-14 +S
  - 27's
  - 24's ✖

✓ **S + N good option**

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N, P, K & S.. Types

- 18-6-12 +S
- 18-4-12 +S
- 23-10-0 +S
- 29-0-14 +S
- Etc….

P & K Sources Grazing

- 13-6-20 +S
- 10-5-25 / 0-7-30
- 15-3-20 +S
- 50% K
- Request any blend

P & K Sources Silage / Maize

S available in compounds

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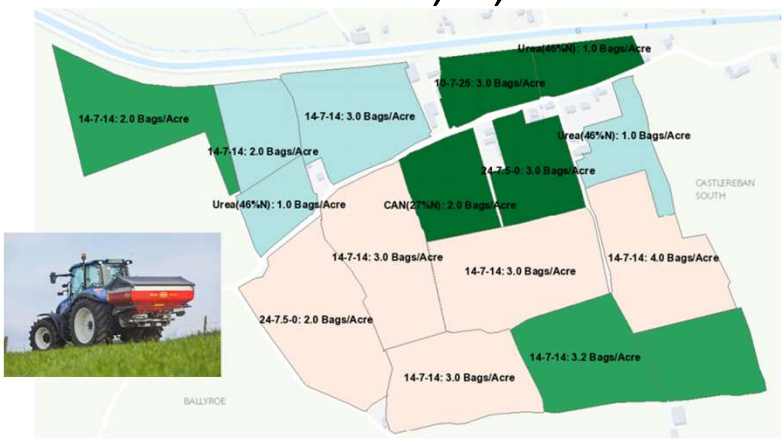
Timing of Application of Fertiliser N, P, K & S



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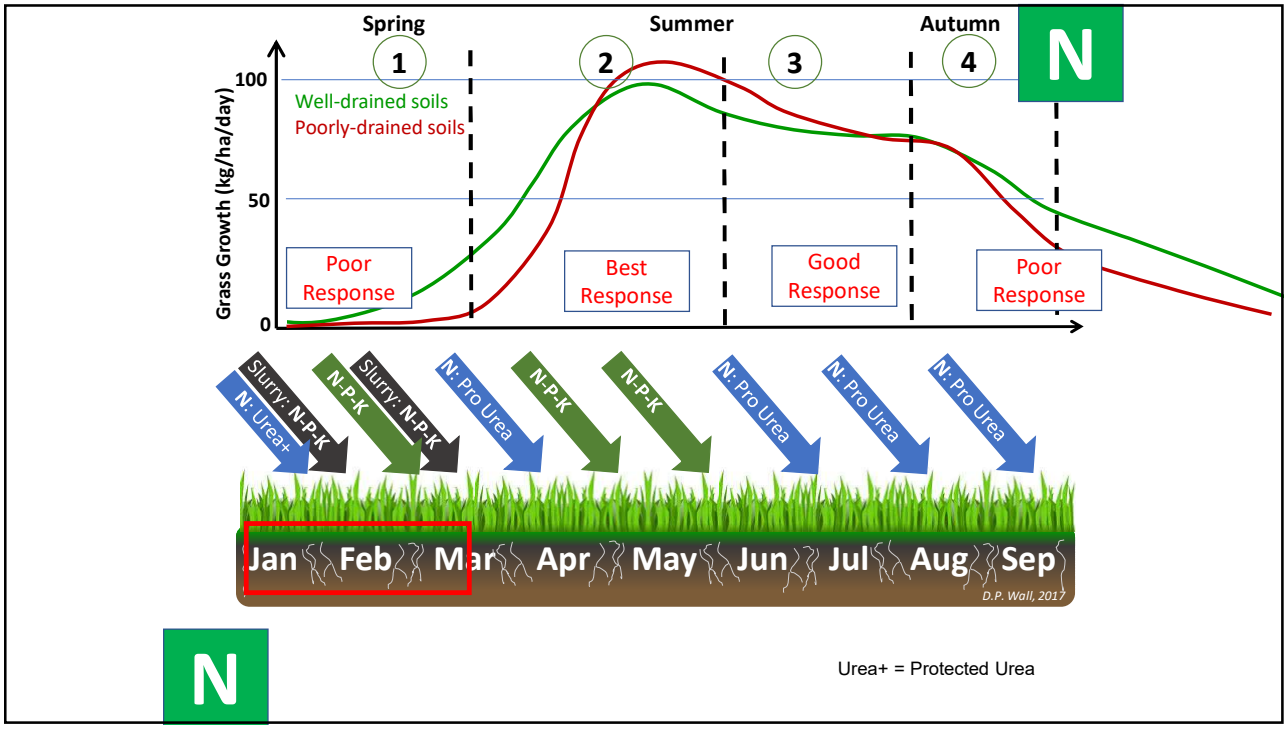

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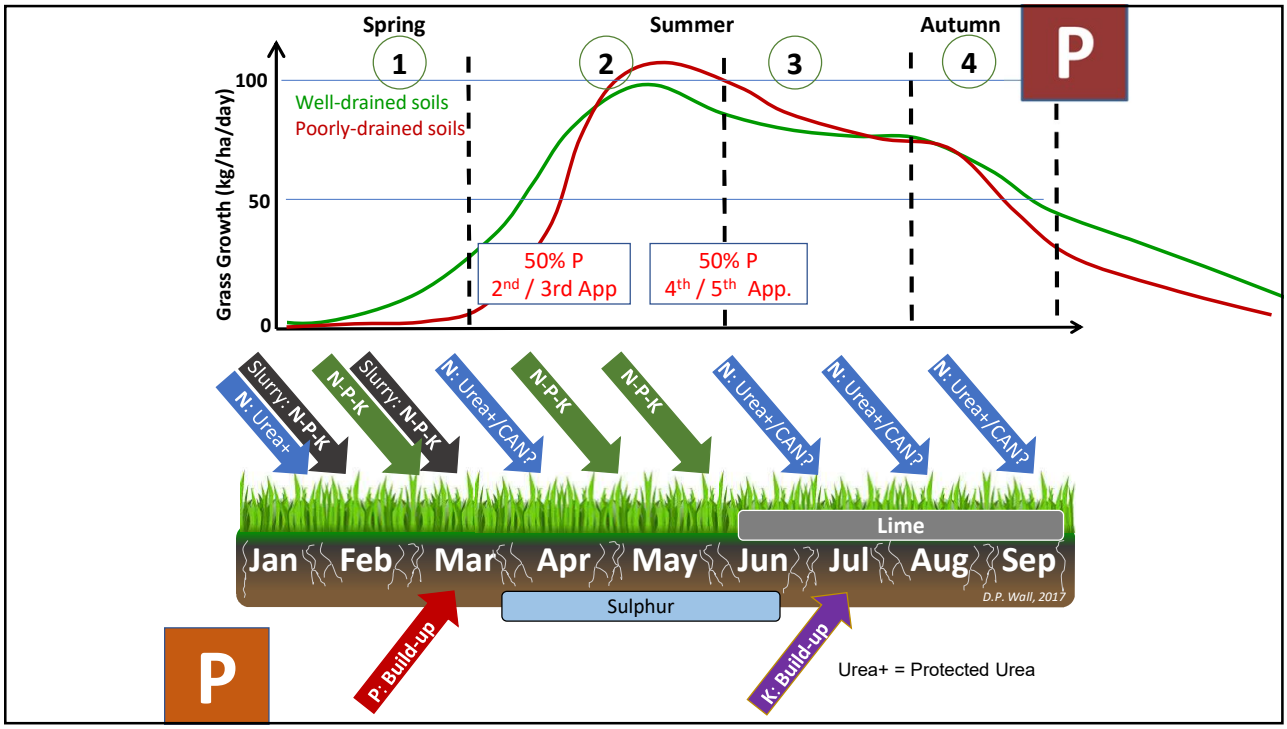
Spring
Summer
Autumn
1
2
3
4
P
100
50
0
Grass Growth (kg/ha/day)
Well-drained soils
Poorly-drained soils
50% P
2nd / 3rd App
50% P
4th / 5th App.
Slurry: N-P-K
N: Urea+
N-P-K
N: Urea+/CAN?
Lime
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
D.P. Wall, 2017
Sulphur
P
P: Build-up
K: Build-up
Urea+ = Protected Urea

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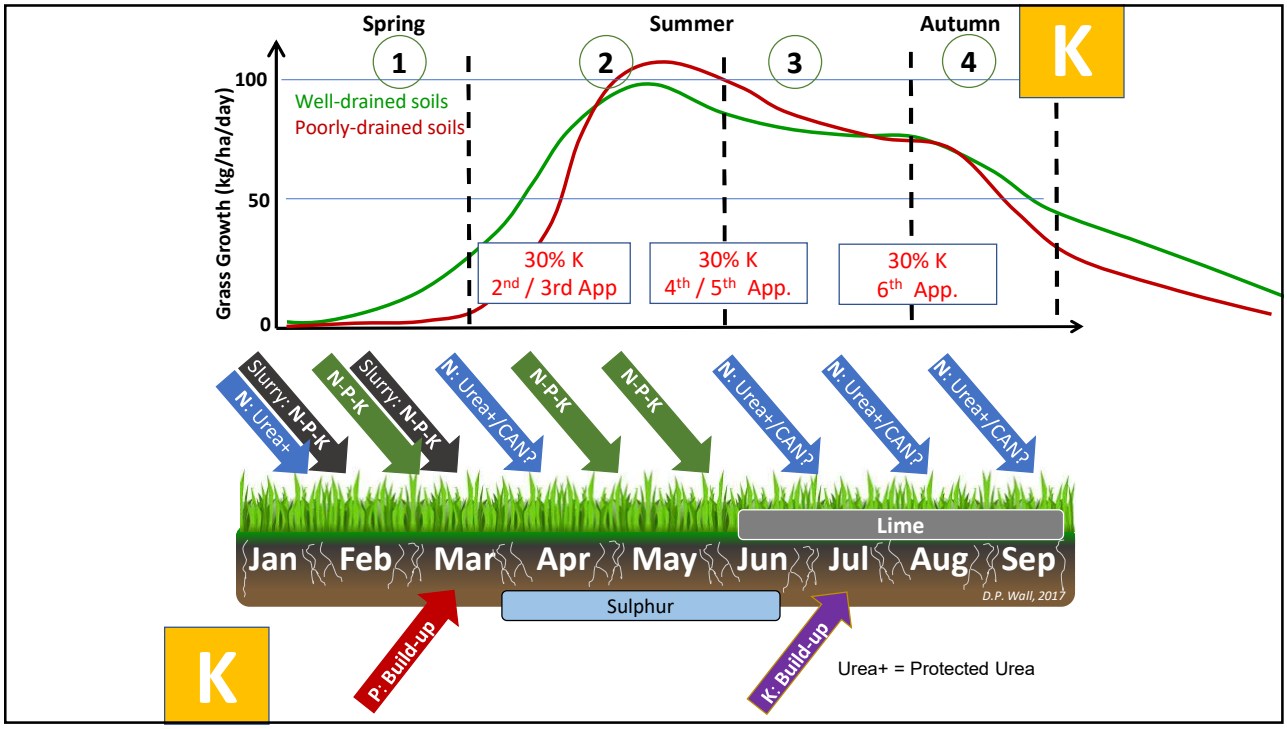
Spring
Summer
Autumn
1
2
3
4
K
100
50
0
Grass Growth (kg/ha/day)
Well-drained soils
Poorly-drained soils
30% K
2nd / 3rd App
30% K
4th / 5th App.
30% K
6th App.
Slurry: N-P-K
N: Urea+
N-P-K
N: Urea+/CAN?
Lime
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
D.P. Wall, 2017
Sulphur
K
P: Build-up
K: Build-up
Urea+ = Protected Urea

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Example fertiliser programmes & products (kg/ha)

Fertiliser Programmes - Dairy

Fertiliser Programmes not adjusted for Lime

Products Used

Protected Urea 46% N - Pro Urea

Protected Urea 40% N + 6% S - Pro Urea+S

Protected Urea 29% N + 14% K & 3.5% S – 29-0-14 +S

18-6-12 + 3% S, 13-6-20 + S

Note Fertiliser prices spring 2020

Suggested Fertiliser programmes & timing adjust for group training

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Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Dry Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	**Total kg/ha**
Product (kg/ha)		45 kg/ha ProUrea	250 kg/ha 18-6-12+S	110kg/ha Pro Urea	225 kg/ha 18-6-12+S	55 kg/ha Pro Urea	45 kg/ha ProUrea	
N	**200**	20	45	50	40	25	20	**200**
P	**29**		15		14			**29**
K	**65**		30		27			**57**
S	**15**		8		7			**15**
Cost €/ha		***17***	***90***	***42***	***86***	***21***	***17***	***€273/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-6-12+ 3% S - €360, 18-612 - €350. 18-4-12+ S €350/tonne								

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Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Wet Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	
Product (kg/ha)		100kg/ha Pro Urea	250 kg/ha 18-6-12+S	110 kg/ha ProUrea	225 kg/ha 18-6-12+S	45 kg/ha ProUrea	**Total kg/ha**
N	**200**	45	45	50	40	20	**200**
P	**29**		15		14		**27**
K	**65**		30		27		**63**
S	**15**		8		7		**15**
Cost €/ha		***38***	***93***	***42***	***83***	***17***	***€273/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 *18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12 +S = €370/tonne*							

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Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Dry Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	
Product (kg/ha)		55 kg/ha ProUrea	275 kg/ha 18-4-12+S	110kg/ha Pro Urea	275 kg/ha 18-4-12+S	60 kg/ha Pro Urea	60 kg/ha ProUrea	**Total kg/ha**
N	**225**	25	50	50	50	27	28	**225**
P	**29**		17		11			**28**
K	**65**		33		33			**66**
S	**12**		8		8			**18**
Cost €/ha		***21***	***99***	***42***	***96***	***23***	***23***	***€304/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 *18-6-12+ 3% S - €360, 18-612 - €350. 18-4-12+ S €350/tonne*								

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Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Wet Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	
Product (kg/ha)		110kg/ha Pro Urea	275 kg/ha 18-6-12+S	110 kg/ha ProUrea	250 kg/ha 18-4-12+S	65 kg/ha ProUrea	**Total kg/ha**
N	**225**	50	50	50	45	30	**225**
P	**29**		17		10		**27**
K	**65**		33		30		**63**
S	**20**		8		8		**18**
Cost €/ha		***42***	***102***	***42***	***88***	***25***	***€299/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12 +S = €370/tonne							

39

Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Dry Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	
Product (kg/ha)		55 kg/ha ProUrea	310 kg/ha 18-4-12+S	125kg/ha Pro Urea	310 kg/ha 18-4-12+S	60 kg/ha Pro Urea	60 kg/ha ProUrea	**Total kg/ha**
N	**250**	25	56	58	56	27	28	**250**
P	**29**		12		12			**24**
K	**65**		37		37			**74**
S	**12**		9		9			**18**
Cost €/ha		***21***	***109***	***48***	***109***	***23***	***23***	***€333/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-20+ S €370/tonne								

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Dairy		Rates of N, P & K (kg/ha) & fertiliser products (kg/ha) - **Wet Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	**Total kg/ha**
Product (kg/ha)		125kg/ha Pro Urea	310 kg/ha 18-6-12+S	120 kg/ha ProUrea	250 kg/ha 18-4-12+S	65 kg/ha ProUrea	
N	**250**	58	56	55	45	30	**244**
P	**29**		19		10		**29**
K	**65**		37		30		**67**
S	**20**		9		8		**17**
Cost €/ha		***48***	***109***	***46***	***88***	***25***	***€316/ha***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18'-6-12 +S = €370/tonne							

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Fertiliser Programmes - Dairy

Example fertiliser programmes & products (units/ac)

Fertiliser Programmes not adjusted for conc.

Products Used

Protected Urea 46% N - Pro Urea

Protected Urea 40% N + 6% S - Pro Urea+S

Protected Urea 29% N + 14% K & 3.5% S – 29-0-14 +S

18-6-12 + 3% S, 13-6-20 + S

Note Fertiliser prices spring 2020

Suggested Fertiliser programmes & timing adjust for group training

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Dairy		Rates of N, P & K (units/ac) & fertiliser products (units/ac) - **Dry Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	
Product (un/ac)		0.35bg/ac ProUrea	2 bags/ac 18-6-12+S	0.9bags/ac Pro Urea	1.8bags/ac 18-6-12+S	0.4bags/ac Pro Urea	0.4bgs/ac ProUrea	**Total units/ac**
N	**160**	16	35	45	32	16	16	**160**
P	**23**		12		11			**23**
K	**52**		24		22			**46**
S	**12**		6		7			**12**
Cost €/ac		*7*	***36***	***17***	***32***	***9***	***9***	***€110/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-6-12+ 3% S - €360, 18-612 - €350. 18-4-12+ S €350/tonne								

43

Dairy		Rates of N, P & K (units/ac) & fertiliser products (units/ac) – **Wet Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	
Product (un/ac)		0.8 bg/ac Pro Urea	2 bags/ac 18-6-12+S	0.9bg/ac ProUrea	1.8bg/ac 18-6-12+S	0.4bg/ac ProUrea	**Total units/ac**
N	**160**	36	36	40	32	16	**160**
P	**23**		12		11		**23**
K	**52**		24		20		**44**
S	**12**		6		5		**11**
Cost €/ac		***15***	***37***	***17***	***33***	***8***	***€110/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12 +S = €370/tonne							

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Dairy		Rates of N, P & K (units/ac) & fertiliser products (units/ac) - **Dry Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	
Product (un/ac)		0.4bag/ac ProUrea	2.25bg/ac 18-6-12+S	0.9bg/ac Pro Urea	2.25bg/ac 18-6-12+S	0.4bg/ac Pro Urea	0.4bg/ac ProUrea	**Total units/ac**
N	**180**	20	40	40	40	20	20	**180**
P	**23**		9		9			**18**
K	**52**		27		27			**66**
S	**12**		7		7			**18**
Cost €/ac		***8***	***39***	***17***	***39***	***8***	***8***	***€119/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-6-12+ 3% S - €360, 18-612 - €350. 18-4-12+ S €350/tonne								

45

Dairy		Rates of N, P & K (units/ac) & fertiliser products (units/ac) - **Wet Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	
Product (un/ac)		0.9bag/ac Pro Urea	2.25bg/ac 18-6-12+S	0.9bag/ac Pro Urea	2 bg/ac 18-4-12+S	0.5bg/ac ProUrea	**Total units/ac**
N	**180**	40	40	40	36	24	**225**
P	**23**		14		8		**27**
K	**52**		27		24		**63**
S	**12**		7		6		**18**
Cost €/ac		***17***	***42***	***17***	***37***	***9***	***€122/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12 +S = €370/tonne							

46

Dairy		Rates of N, P & K (units/ac) & fertiliser products (units/ac) - **Dry Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac Soil P and K levels assumed to be **index 2**						
Advice		**Feb**	**March**	**April**	**May**	**June / July**	**Sept**	
Product (units/ac)		0.4 bags/ac ProUrea	2.5bags/ac 18-4-12+S	1 bag/ac Pro Urea	2.5bags/ac 18-4-12+S	0.5 bag/ac Pro Urea	0.4bag/ac Pro Urea	**Total units/ac**
N	**200**	20	45	46	45	23	20	**199**
P	**23**		10		10			**20**
K	**52**		30		30			**60**
S	**16**		8		8			**16**
Cost€/ac		8	44	19	44	10	8	***€135/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12+S €370/tonne								

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Dairy		Rates of N, P & K (units/ac) & fertiliser products (bags/ac) - **Wet Soil** Farm stocked at 210kg Org N/ha or 1.0LU/ac. Soil P and K levels assumed to be **index 2**					
Advice		**March**	**April**	**May**	**June / July**	**Sept**	
Product (units/ac)		1 bag/ac Pro Urea	2.5 bags/ac 18-6-12+S	1 bag/ac ProUrea	2 bags/ac 18-4-12+S	0.5 bag/ac ProUrea	**Total units/ac**
N	**200**	46	45	46	36	23	**196**
P	**23**		15		8		**23**
K	**52**		30		24		**54**
S	**16**		8		6		**14**
Cost €/ac		***19***	***45***	***19***	***36***	***9***	***€128/ac***
ProUrea = Urea 46% + NBPT - €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380 18-4-12+ 3% S - €350, 18-4-12 - €340. 18-6-12+S €370/tonne							

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Fertiliser Programmes - Drystock

Example fertiliser programmes & products (kg/ha)

Fertiliser Programmes not adjusted for conc.

Products Used

Protected Urea 46% N - Pro Urea

Protected Urea 40% N + 6% S - Pro Urea+S

Protected Urea 29% N + 14% K & 3.5% S – 29-0-14 +S

18-6-12 + 3% S, 13-6-20 . Note Fertiliser prices spring 2020

Recommended N, P & K Rates as per Teagasc Green Book

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Drystock		Recommended rates of N, P & K (kg/ha) & fertiliser products (kg/ha). **Dry Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 1.**						
Advice		**Feb**	**March**	**April**	**May**	**June /July**	**Sept**	**Total Kg/ha**
Product (kg/ha)		15m³/ha Cattle Slurry	195 kg/ha 18-6-12 +S	75 kg/ha ProUrea	195 kg/ha 18-6-12 +S	55 kg/ha ProUrea	45 kg/ha Pro Urea	
N	**175**	15	35	35	35	25	20	165
P	**33**	6	12		12			30
K	**80**	48	23		23			94
S	**20**	--	6		6			12
Cost €/ha		--	72	29	72	21	16.5	***€211/ha***

ProUrea = Urea 46% + NBPT, Cost/tonne = €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380

18-6-12+ 3% S - €370, 18-6-12 - €360. 125kg/ha of MOP 50% once every 4 years.

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Drystock		Recommended rates of N, P & K (kg/ha) & fertiliser products (kg/ha). **Wet Soil** Farm stocked at 210kg Org N/ha or 2.5LU/ha. Soil P and K levels assumed to be **index 1.**					
Advice		**March**	**April**	**May**	**June /July**	**Sept**	**Total Kg/ha**
Product (kg/ha)		85 kg/ha ProUrea	305 kg/ha 18-6-12 +S	250 kg/ha 18-6-12 +S	110 kg/ha ProUrea	85 kg/ha 29-0-14+S	
N	**215**	40	55	45	50	25	215
P	**33**		18	15			33
K	**80**		37	30		12	79
S	**20**		9	8		3	20
Cost €/ha		32	113	93	42	32	***€ 312/ha***

ProUrea = Urea 46% + NBPT, Cost/tonne = €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + S - €380
18-6-12+ 3% S - €370, 18-6-12 - €360.

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Fertiliser Programmes - Drystock

Example fertiliser programmes & products (units/ac)

Fertiliser Programmes not adjusted for conc.

Products Used

Protected Urea 46% N - Pro Urea

Protected Urea 40% N + 6% S - Pro Urea+S

Protected Urea 29% N + 14% K & 3.5% S – 29-0-14 +S

18-6-12 + 3% S, 13-6-20 Note Fertiliser prices spring 2020

Recommended N, P & K Rates as per Teagasc Green Book

Suggested Fertiliser programmes & timing adjust for group training

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Drystock		N, P & K Advice (units/ac) & fertiliser products (bags/ac) – **Dry Soil** Farm stocked 0.8 LU/ac (170kg Org N/ha or 2.0LU/ha). Soil P and K levels assumed to be index 1.						
Advice		**Feb**	**March**	**April**	**May**	**June /July**	**Sept**	**Total Units/ac**
Product (units/ac)		0.4bag/ac ProUrea	2bags/ac 18-6-12 +S	0.8 bag/ac ProUrea	2bags/ac 18-6-12 +S	0.5bag/ac ProUrea	0.5 bag/ac 29-0-14+S	
N	**172**	20	36	36	36	24	16	172
P	**26**		12		12			24
K	**64**		24		24		7	55
S	**16**		6		6		2.5	14.5
Cost €/ac		8	37	15	37	10	13	***€120 /ac***

ProUrea = Urea 46% + NBPT / 2-NBPT, Cost/tonne = €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + 4% S - €380
18-6-12+ 3% S - €370, 18-6-12 - €360. Apply 1 bag/ac of MOP 50% once every 4 years.

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Drystock		N, P & K Advice (units/ac) & fertiliser products (bags/ac) – **Wet Soil** Farm stocked 1.0 LU/ac (210kg Org N/ha or 2.5LU/ha). Soil P and K levels assumed to be index 1.					
Advice		**March**	**April**	**May**	**June /July**	**Sept**	**Total units/ac**
Product (units/ac)		0.7 bag/ac ProUrea	2.4 bags/ac 18-6-12 +S	2 bag/ac 18-6-12 +S	0.9 bags/ac ProUrea	0.7 bags/ac 29-0-14+S	
N	**172**	32	43	36	40	20	171
P	**26**		14	12			26
K	**64**		30	24		10	64
S	**16**		5	6		3	14
Cost/ac		13	44	37	17	13	**€124/ac**

ProUrea = Urea 46% + NBPT / 2-NBPT, Cost/tonne = €380/t, ProUrea 40% N & 6% S- €380t/, 29-0-14 + 4% S - €380
18-6-12+ 3% S - €370, 18-6-12 - €360.

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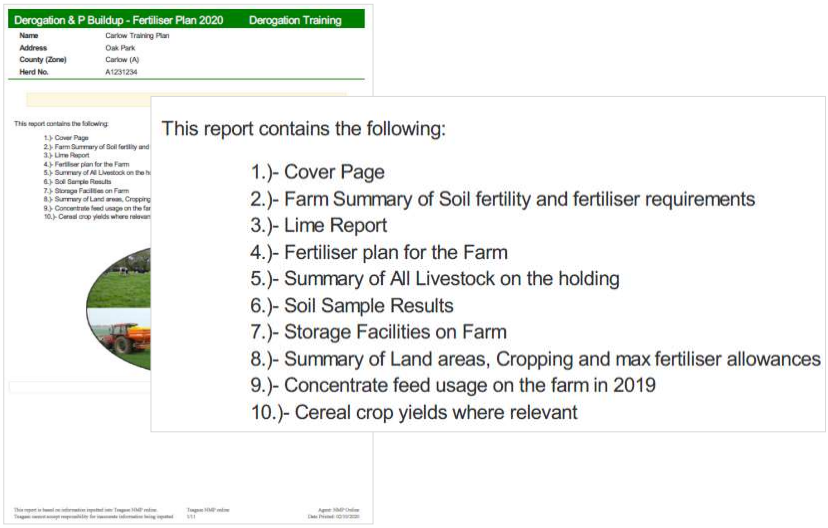
Fertiliser Plan – What's in it?



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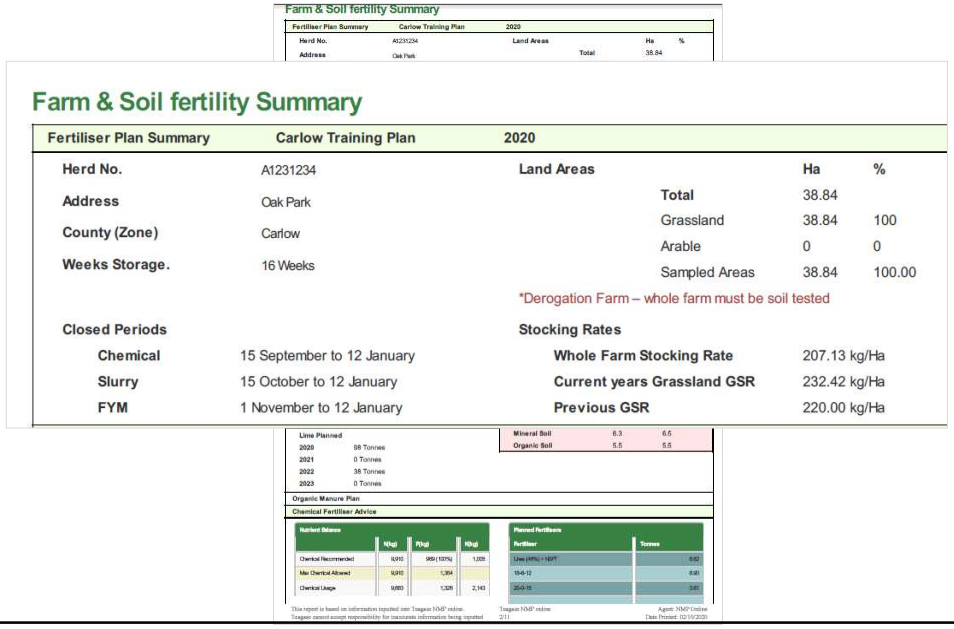
Summary of Farm Soil Fertility



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Summary of Farm Soil Fertility

Farm & Soil fertility Summary

Soil Fertility Summary

Overall Fertility Status	Lime	Phosphorus	Potassium
pH > 6.2, P & K index 3 or 4	Soil pH > 6.2	P Index	K Index

	Ha's	%
Yes	3.86	10%
No	34.98	90%

pH	Ha's	%
<5.5	0.00	0%
5.5-5.9	12.79	33%
5.9-6.2	18.34	47%
6.2-6.5	4.02	10%
>6.5	3.69	10%

Index	Ha's	%
1	10.04	26%
2	8.02	21%
3	20.78	54%
4	0.00	0%

Index	Ha's	%
1	6.42	17%
2	9.35	24%
3	10.56	27%
4	12.51	32%

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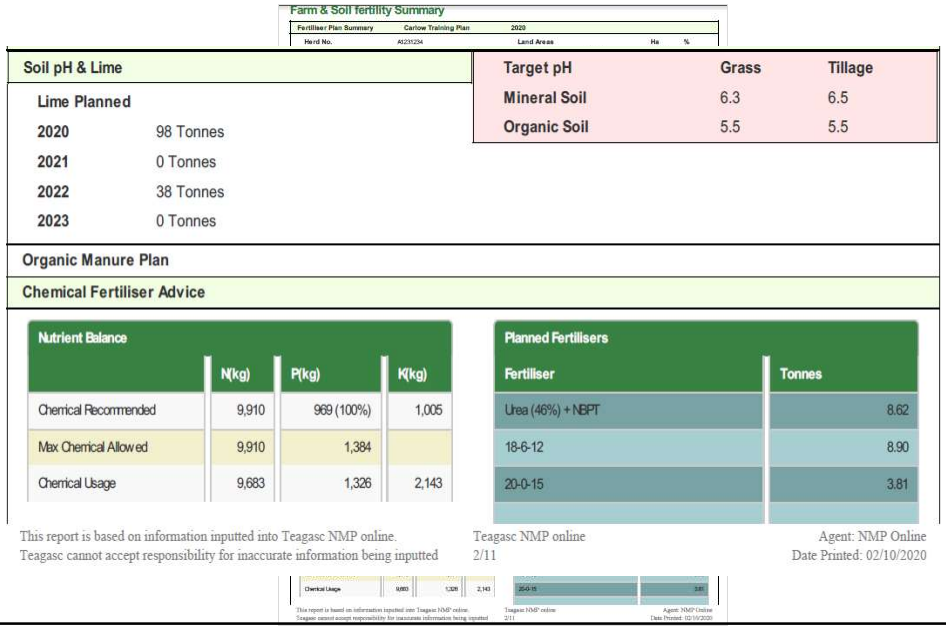
Summary of Farm Soil Fertility



Farm & Soil fertility Summary

Fertiliser Plan Summary	Carlow Training Plan	2020		
Herd No.	A0231234	Land Areas	Ha	%

Soil pH & Lime

Target pH	Grass	Tillage
Mineral Soil	6.3	6.5
Organic Soil	5.5	5.5

Lime Planned

2020	98 Tonnes
2021	0 Tonnes
2022	38 Tonnes
2023	0 Tonnes

Organic Manure Plan

Chemical Fertiliser Advice

Nutrient Balance

	N(kg)	P(kg)	K(kg)
Chemical Recommended	9,910	969 (100%)	1,005
Max Chemical Allowed	9,910	1,384	
Chemical Usage	9,683	1,326	2,143

Planned Fertilisers

Fertiliser	Tonnes
Urea (46%) + NBPT	8.62
18-6-12	8.90
20-0-15	3.81

This report is based on information inputted into Teagasc NMP online.
Teagasc cannot accept responsibility for inaccurate information being inputted

Teagasc NMP online
2/11

Agent: NMP Online
Date Printed: 02/10/2020

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Soil Sample Results

Soil Samples Results

	Sample Id	Sample Code	Sample Date	Sampled Area (ha)	pH	Lime Req	P Value	K Value	Trace Elements Soil Type
	CAG/2491	SS9	02/02/2018	5.0	6.0	3.5	6.7	64.1	Clay
	CAG/2489	SS11	02/02/2018	2.6	5.9	5.0	6.1	43.1	Clay
	CAG/2490	SS10	02/02/2018	4.4	5.8	5.0	5.4	56.6	Clay
	CAG/2492	SS8	02/02/2018	3.3	6.0	3.5	2.5	118.0	Clay
	CAG/2493	SS7	02/02/2018	3.3	6.1	1.5	1.5	157.0	Clay
	CAG/2494	SS6	02/02/2018	3.4	5.5	8.0	2.4	110.0	Clay
	CAG/2496	SS4	02/02/2018	0.2	6.4	0.0	5.9	119.0	Clay
	CAG/2495	SS5	02/02/2018	5.0	5.8	5.0	8.0	269.0	Clay
	CAG/2497	SS3	02/02/2018	4.2	6.0	3.5	4.9	231.0	Clay
	CAG/2498	SS2	02/02/2018	3.7	6.6	0.0	5.8	116.0	Clay
	CAG/2499	SS1	02/02/2018	3.9	6.3	0.0	4.4	42.7	Clay

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Farm Liming Programme

Lime Requirements

Plot Name	Crop	Area (Ha)	Soil Sample Id	Soil Sample pH	Lime Req (T/Ha)	Advised Lime 2020 (T/Ha)	2021 (T/Ha)	2022 (T/Ha)	2023 (T/Ha)
1	Grazing	5.0	CAG/2491	6.0	3.5	3.5	0.0	0.0	0.0
1 a	Grazing	2.6	CAG/2489	5.9	5.0	3.0	0.0	2.0	0.0
1 B	2 Cut + Grazing	4.4	CAG/2490	5.8	5.0	3.0	0.0	2.0	0.0
2 A	1 Cut + Grazing	3.3	CAG/2492	6.0	3.5	3.5	0.0	0.0	0.0
2 b	Grazing	3.3	CAG/2493	6.1	1.5	1.5	0.0	0.0	0.0
2 c	2 Cut + Grazing	3.4	CAG/2494	5.5	8.0	4.0	0.0	4.0	0.0
3	2 Cut + Grazing	0.2	CAG/2496	6.4	0.0	0.0	0.0	0.0	0.0
4	Grazing	5.0	CAG/2495	5.8	5.0	3.0	0.0	2.0	0.0
5 A	Grazing	4.2	CAG/2497	6.0	3.5	3.5	0.0	0.0	0.0
5 B	1 Cut + Grazing	3.7	CAG/2498	6.6	0.0	0.0	0.0	0.0	0.0
5 C	Grazing	3.9	CAG/2499	6.3	0.0	0.0	0.0	0.0	0.0
					Annual Totals (tons)	98	0	38	0

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Cattle Slurry / Fertilisers

Fertiliser plan for the Farm

Manure Allocations

Fertiliser	Estimated T	Applied T	Balance T
Cattle Slurry	1,091	1,124	0
Farmyard Manure	149	0	149
Total P in Manures (Grazing + Non-Grazing 414.0)			334

Slurry Produced / Allocation

Nutrient Balance

	N(kg)	P(kg)	K(kg)
Chemical Recommended	9,910	969 (100%)	1,005
Max Chemical Allowed	9,910	1,384	
Chemical Usage	9,683	1,326	2,143

Max. N & P's

Fertiliser List

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Fertiliser Splits

Plot(Ha)	Crop	SFP Soil Type	Index N | P | K	Jan-Mar Split 1 Fertiliser	Jan-Mar Split 1 Rate	Jan-Mar Split 2 Fertiliser	Jan-Mar Split 2 Rate	Apr-May Split 1 Fertiliser	Apr-May Split 1 Rate	Apr-May Split 2 Fertiliser	Apr-May Split 2 Rate	June-July Split 1 Fertiliser	June-July Split 1 Rate	June-July Split 2 Fertiliser	June-July Split 2 Rate
1(5.0)	Grazing	Dry (well drained) ...	1|3|2	Urea (46%) + NBPT	0.5 Bags/Acre	18-6-12	1.5 Bags/Acre	Urea (46%) + NBPT	0.8 Bags/Acre	18-6-12	2.0 Bags/Acre	20-0-15	1.5 Bags/Acre	Urea (46%) + NBPT	0.6 Bags/Acre
1 a(2.6)	Grazing	Dry (well drained) ...	1|3|1	Urea (46%) + NBPT	0.5 Bags/Acre	18-6-12	1.5 Bags/Acre	Urea (46%) + NBPT	0.8 Bags/Acre	18-6-12	2.0 Bags/Acre	20-0-15	1.5 Bags/Acre	Urea (46%) + NBPT	0.6 Bags/Acre
1 B(4.4)	2 Cut + Grazing	Dry (well drained) ...	1|3|2	Urea (46%) + NBPT	0.5 Bags/Acre	Cattle Slurry	3000.0 Gals/Acre	24-5-5	3.5 Bags/Acre	Cattle Slurry	2500.0 Gals/Acre	25-5-5	3.0 Bags/Acre		
2 A(3.3)	1 Cut + Grazing	Dry (well drained) ...	1|1|3	Urea (46%) + NBPT	0.5 Bags/Acre	Cattle Slurry	3000.0 Gals/Acre	24-5-5	3.5 Bags/Acre	Cattle Slurry	2500.0 Gals/Acre	24-7.5-0	3.0 Bags/Acre		
2 b(3.3)	Grazing	Dry (well drained) ...	1|1|4	Urea (46%) + NBPT	0.5 Bags/Acre	Cattle Slurry	3000.0 Gals/Acre	24-5-5	3.0 Bags/Acre	Cattle Slurry	2500.0 Gals/Acre	24-5-5	2.0 Bags/Acre		
2 c(3.4)	2 Cut + Grazing	Dry (well drained) ...	1|1|3	Urea (46%) + NBPT	0.5 Bags/Acre	Cattle Slurry	3000.0 Gals/Acre	24-5-5	3.5 Bags/Acre	Cattle Slurry	2500.0 Gals/Acre	24-7.5-0	3.0 Bags/Acre		
3(0.2)	2 Cut + Grazing	Dry (well drained) ...	1|3|3	Urea (46%) + NBPT	1.5 Bags/Acre	Cattle Slurry	3500.0 Gals/Acre			Urea (46%) + NBPT	2.0 Bags/Acre				
4(5.0)	Grazing	Dry (well drained) ...	1|3|4	Urea (46%) + NBPT	0.5 Bags/Acre	18-6-12	1.5 Bags/Acre	Urea (46%) + NBPT	0.8 Bags/Acre	18-6-12	2.0 Bags/Acre	20-0-15	1.5 Bags/Acre	Urea (46%) + NBPT	0.6 Bags/Acre
5 A(4.2)	Grazing	Dry (well drained) ...	1|2|4	Urea (46%) + NBPT	0.5 Bags/Acre	18-6-12	1.5 Bags/Acre	Urea (46%) + NBPT	0.8 Bags/Acre	18-6-12	2.0 Bags/Acre	20-0-15	1.5 Bags/Acre	Urea (46%) + NBPT	0.6 Bags/Acre
5 B(3.7)	1 Cut + Grazing	Dry (well drained) ...	1|3|3	Urea (46%) + NBPT	0.5 Bags/Acre	Cattle Slurry	3000.0 Gals/Acre	24-5-5	3.5 Bags/Acre	Cattle Slurry	2500.0 Gals/Acre	24-7.5-0	3.0 Bags/Acre		
5 C(3.9)	Grazing	Dry (well drained) ...	1|2|1	Urea (46%) + NBPT	0.5 Bags/Acre	18-6-12	1.5 Bags/Acre	Urea (46%) + NBPT	0.8 Bags/Acre	18-6-12	2.0 Bags/Acre	20-0-15	1.5 Bags/Acre	Urea (46%) + NBPT	0.6 Bags/Acre

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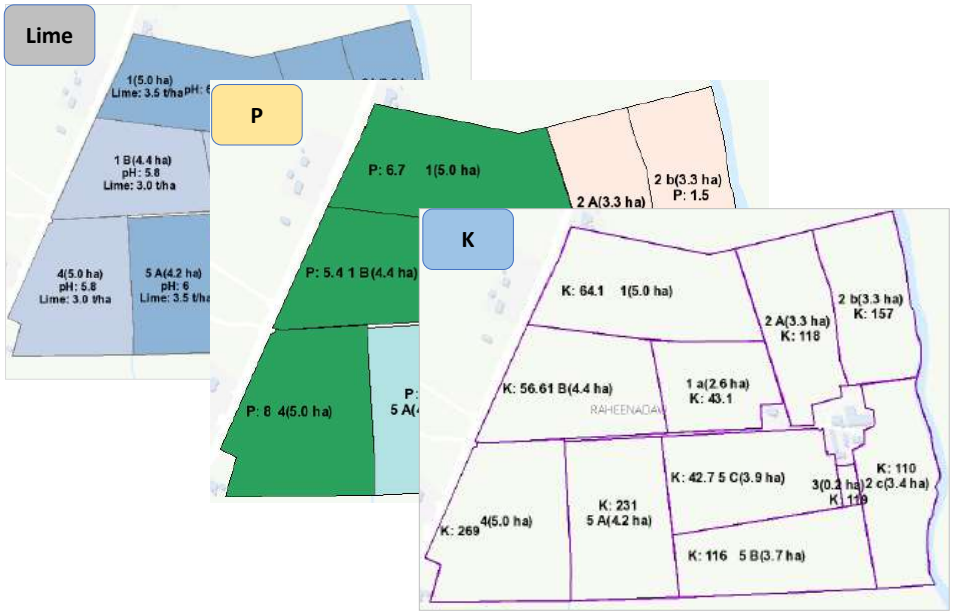
Maps



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In Summary

- Makes best use of soil test results
- Optimise soil pH
- Use applied N efficiently
- Optimum P & K – Index 3
- Watch K & S
- Update fertiliser plan
- Plan for 2021
- Identify Lime & Fertiliser Req.'s from fertiliser plan

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Farming Sustainably Under Derogation
NMP Online can help



Derogation Training

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- Do a NMP for your farm to improve NMP Online
  - Value for your investment in soil fertility,
  - Increasing grass growth,
  - Reducing inputs,
  - Water quality,
  - Reducing GHG's / Ammonia

- The Sustainable Fertiliser plan is NEW – ask your advisor





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What to consider when completing NMP's

"Sources" of nutrients, pathways, receptors

- OM maps
- Watercourses, streams and dry drains
- Sloped fields and fields prone to waterlogging
- Wells and water abstractions points
- Critical Source Areas
- Water quality in the area
- Farm roads/out-wintering/Farmyards
- Application of organic and chemical manures to low risk fields

Must address soil types for every soil sample

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Consider drains/watercourses & buffer zones

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Know your soil type

- Dry
- Wet
- Peat

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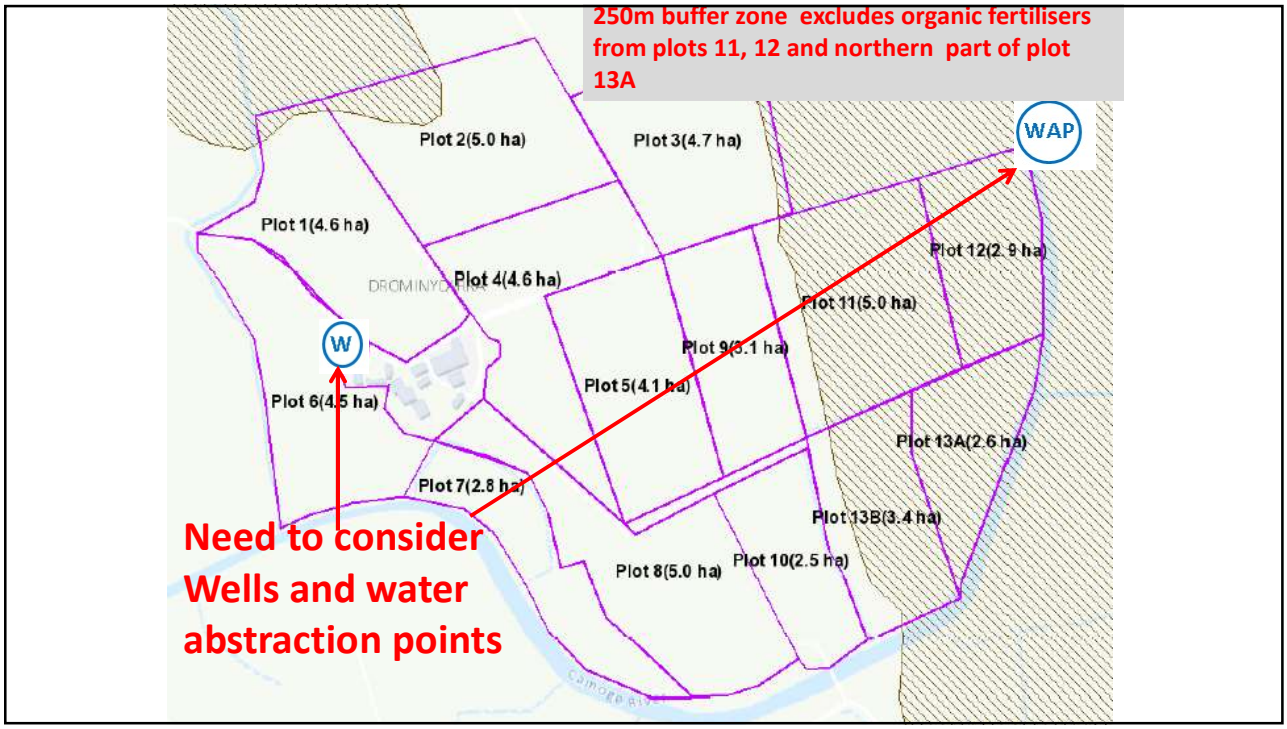
250m buffer zone excludes organic fertilisers from plots 11, 12 and northern part of plot 13A
WAP
W
Plot 1(4.6 ha)
Plot 2(5.0 ha)
Plot 3(4.7 ha)
Plot 4(4.6 ha)
Plot 5(4.1 ha)
Plot 6(4.5 ha)
Plot 7(2.8 ha)
Plot 8(5.0 ha)
Plot 9(5.1 ha)
Plot 10(2.5 ha)
Plot 11(5.0 ha)
Plot 12(2.9 ha)
Plot 13A(2.6 ha)
Plot 13B(3.4 ha)
Need to consider Wells and water abstraction points

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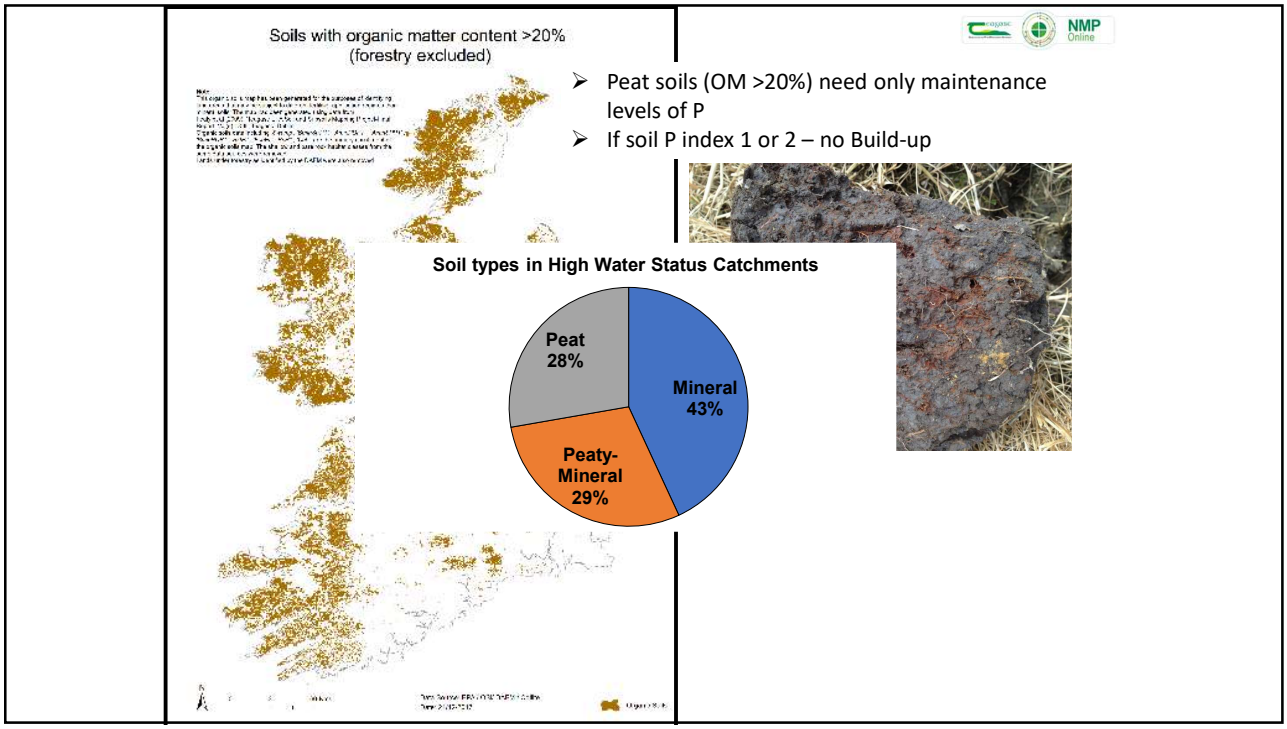
Soils with organic matter content >20% (forestry excluded)
NMP Online
Peat soils (OM >20%) need only maintenance levels of P
If soil P index 1 or 2 – no Build-up
Soil types in High Water Status Catchments
Peat 28%
Mineral 43%
Peaty-Mineral 29%

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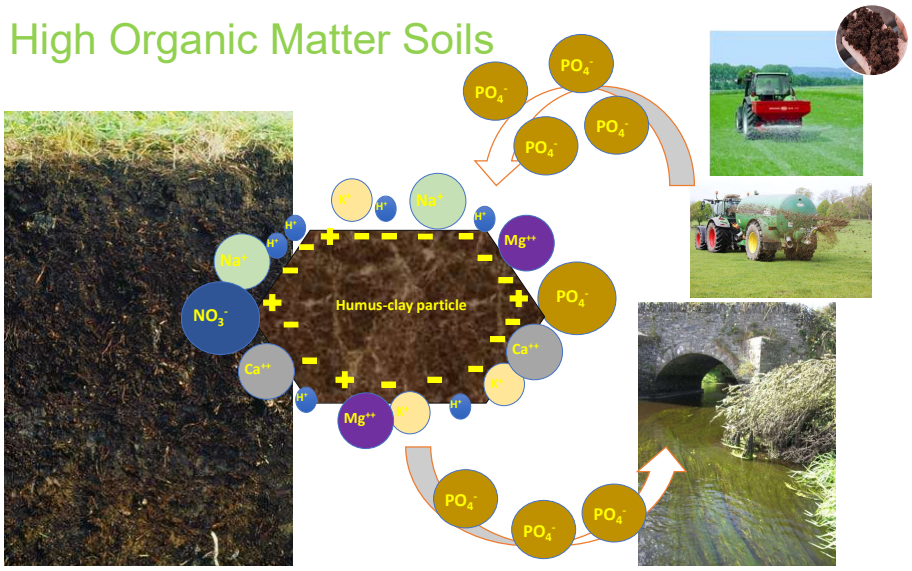
High Organic Matter Soils



Poor P retention capacities in organic matter rich soils !

Maintenance P fertiliser only – No P build-up

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P use on Peat soils

- https://www.youtube.com/watch?v=E7KXK3I_2Ns

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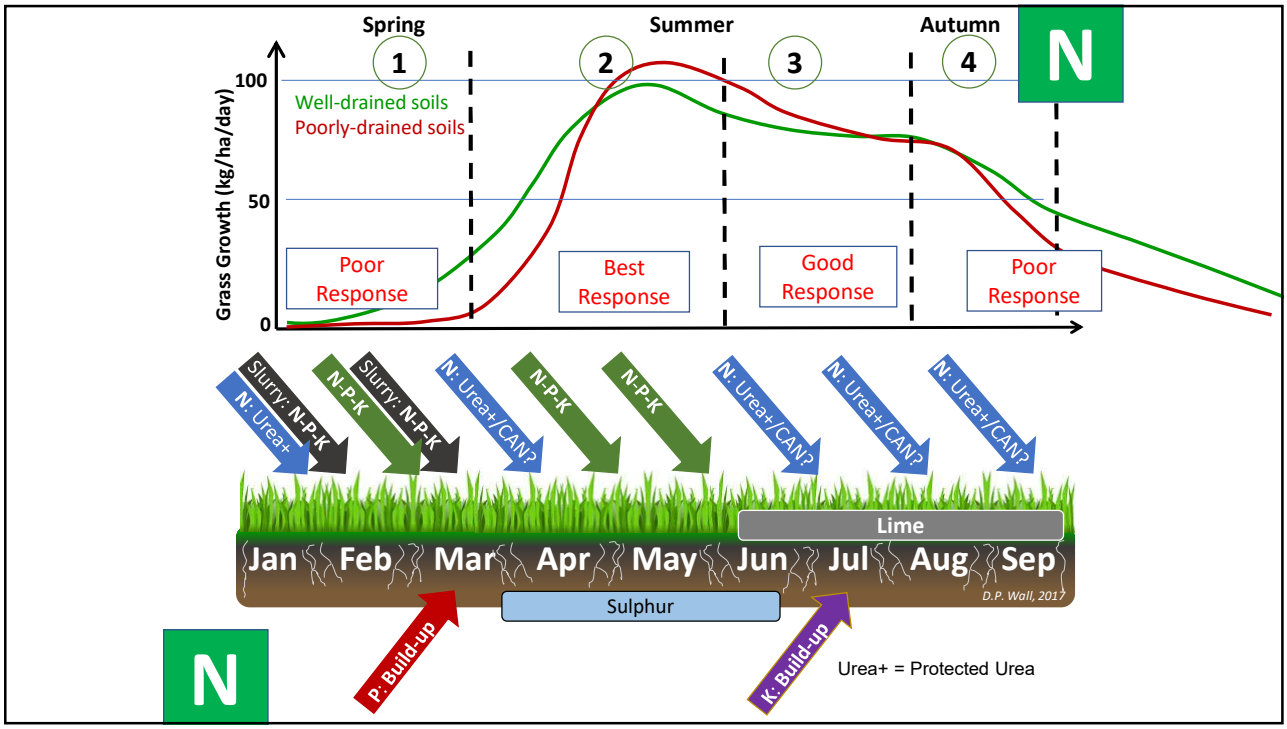
Spring
Summer
Autumn
1
2
3
4
N
100
50
0
Grass Growth (kg/ha/day)
Well-drained soils
Poorly-drained soils
Poor Response
Best Response
Good Response
Poor Response
Slurry: N-P-K
N: Urea+
N-P-K
N: Urea+/CAN?
Lime
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Sulphur
D.P. Wall, 2017
P: Build-up
K: Build-up
Urea+ = Protected Urea

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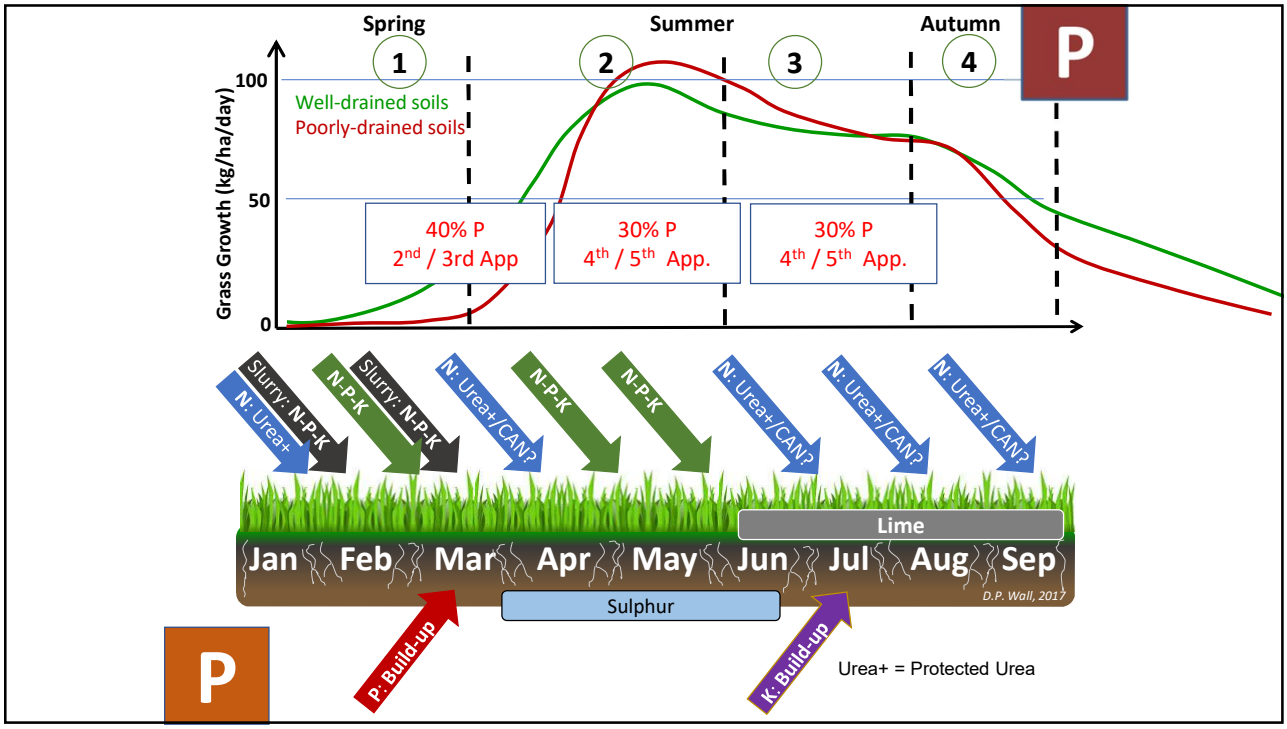
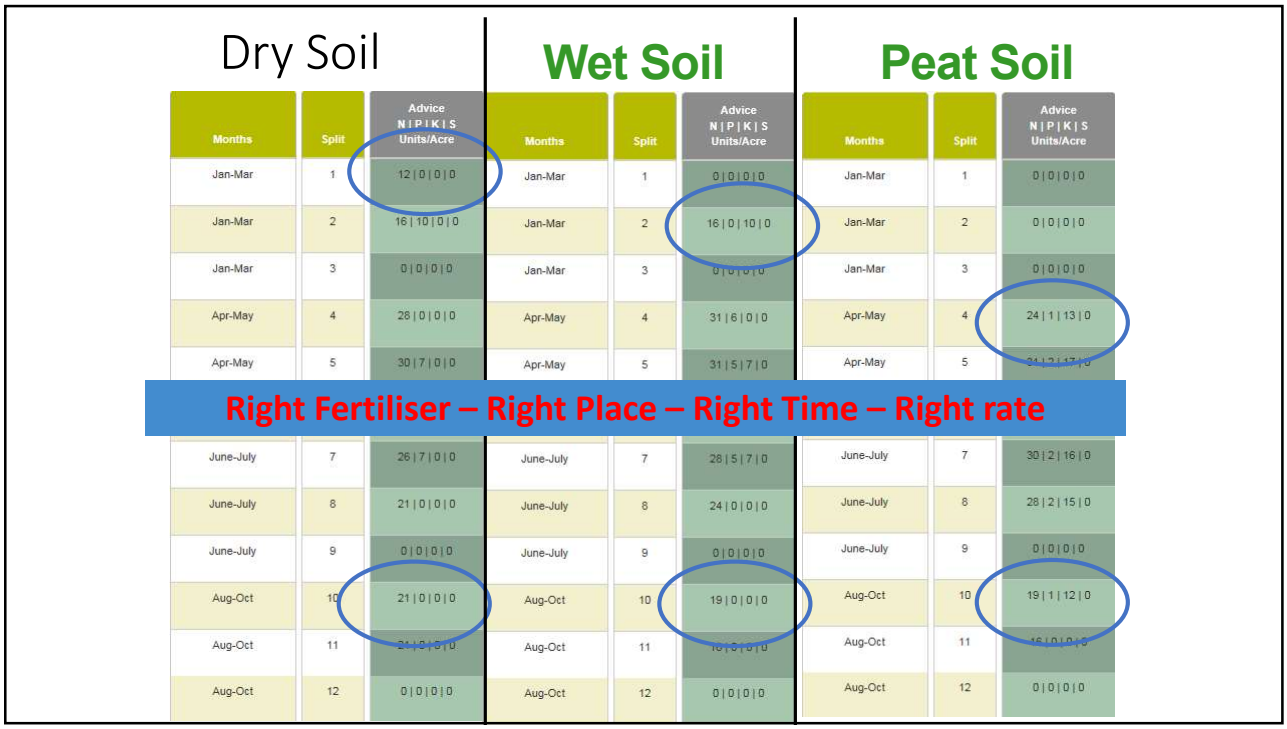

Spring
Summer
Autumn
1
2
3
4
P
100
50
0
Grass Growth (kg/ha/day)
Well-drained soils
Poorly-drained soils
40% P
2nd / 3rd App
30% P
4th / 5th App.
30% P
4th / 5th App.
Slurry: N-P-K
N: Urea+
N-P-K
N: Urea+/CAN?
Lime
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Sulphur
D.P. Wall, 2017
P: Build-up
K: Build-up
Urea+ = Protected Urea

76



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What NMP Online will do

Nitrogen advice on different soil types

- Dry soils =100% of yearly N allowance
- Wet Soils = 95% of yearly N Allowance
- Peat Soils = 85% of yearly N Allowance

- No difference in P or K advice for soil type

- The timing advice for P and K varies across soil type – example below.

Element	SR	Month + %	Month + %	Month + %
P index 2	<85	March @ 50%	May @ 50%	
P index 2	85 to 250	March @ 40%	May @ 30%	June @ 30%
K index 2	<85	April @ 50%	June @ 50%	
K index 2	85 to 250	March @ 40%	May @ 30%	June @ 30%

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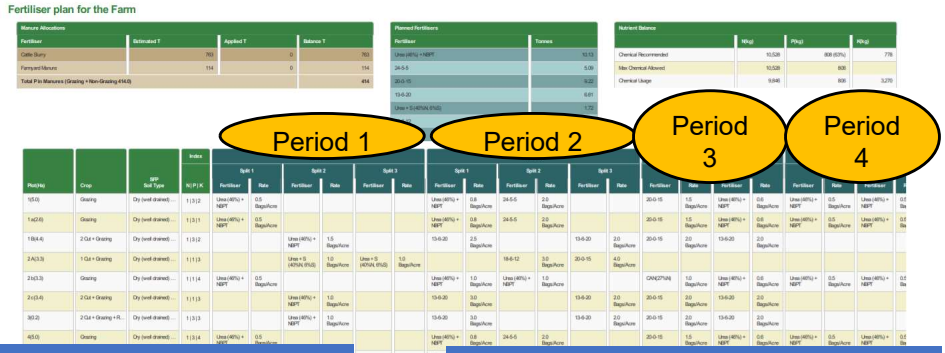
Fertiliser Plan

SFP divides up the growing season into 4 periods



- **Four periods**
- **Jan – March (Period 1)**
- **April, May (Period 2)**
- **June, July (Period 3)**
- **Aug – Oct (Period 4)**

- **Time fertiliser to soil type**
- **Match grass growth to fert**
- **Use Organic manure to replace 1 split**
- **Use Urea + where possible**
- **Save €€€€**

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Period 1

Plot(Ha)	Crop	SFP Soil Type	Index	Jan-Mar			
				Split 1		Split 2	
			N|P|K	Fertiliser	Rate	Fertiliser	Rate
01(1.0)	Grazing	Dry (well drained) ...	1|3|4	Urea (46%) + NBPT	0.5 Bags/Acre	24-7.5-0	1.0 Bags/Acre
02 A(1.4)	1 Cut + Grazing	Dry (well drained) ...	1|4|3	Urea (46%) + NBPT	0.5 Bags/Acre	Urea (46%) + NBPT	2.0 Bags/Acre
02 B(1.8)	1 Cut + Grazing	Dry (well drained) ...	1|2|3	Urea (46%) + NBPT	0.5 Bags/Acre	Urea (46%) + NBPT	2.0 Bags/Acre
03(1.1)	1 Cut + Grazing	Dry (well drained) ...	1|3|4	Urea (46%) + NBPT	0.5 Bags/Acre	24-7.5-0	4.0 Bags/Acre
03 A(2.4)	1 Cut + Grazing	Dry (well drained) ...	1|3|4	Urea (46%) + NBPT	0.5 Bags/Acre	24-7.5-0	4.0 Bags/Acre

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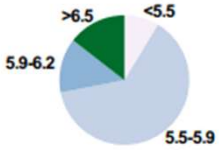
Lime

Soil pH > 6.2



pH	Ha's	%
<5.5	4.20	9%
5.5-5.9	30.60	63%
5.9-6.2	6.60	14%
6.2-6.5	0.00	0%
>6.5	7.00	14%

Soil pH & Lime

Lime Planned	
2021	108 Tonnes
2022	42 Tonnes
2023	0 Tonnes
2024	0 Tonnes

Lime Plan 2021

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Farm Liming Programme

Fields requiring highest level of lime are at the top

Liming programme for each field/year

Lime Requirements

Plot Name	Crop	Area (Ha)	Soil Sample Id	Soil Sample pH	Lime Req (T/Ha)	Advised Lime 2021 (T/Ha)	2022 (T/Ha)	2023 (T/Ha)	2024 (T/Ha)
7	Grazing	3.6	RAR7	5.5	10.0	5.0	5.0	0.0	0.0
8	Maize	4.0	RAR8	5.6	7.5	4.0	3.5	0.0	0.0
2	Grazing + Reseed	3.8	RAR2	5.8	5.0	5.0	0.0	0.0	0.0
3	1 Cut + Grazing	3.5	RAR3	5.6	5.0	5.0	0.0	0.0	0.0
6	Grazing	4.0	RAR6	5.7	5.0	5.0	0.0	0.0	0.0
10	Grazing	3.5	RAR 10	5.7	5.0	5.0	0.0	0.0	0.0
Plot 56	1 Cut + Grazing	4.3	RAR 10	5.7	5.0	0.0	0.0	0.0	0.0
1	Grazing	3.3	RAR1	6.1	2.0	0.0	3.0	0.0	0.0
Plot 1	Grazing	2.0	SS1	6.0	2.0	0.0	0.0	0.0	0.0
Plot 2	1 Cut + Grazing	1.3	SS1	6.0	2.0	0.0	0.0	0.0	0.0
					Annual Totals (tons)	108	42	0	0

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Fertiliser Plan Summary	Low K & Lime Plan	2020			
Herd No.	I1271568	Land Areas		Ha	%
Address	Low K & Lime Plan		Total	58.86	
County (Zone)	Kildare		Grassland	58.86	100
			Arable	0	0

Soil pH & Lime	Target pH	Grass	Tillage
	Mineral Soil	6.3	6.5
	Organic Soil	5.5	5.5

Lime Planned	
2020	175 Tonnes
2021	[illegible] Tonnes
2022	97 Tonnes
2023	0 Tonnes

Organic Manure Plan

Chemical Fertiliser Advice

Nutrient Balance

	N(kg)	P(kg)	K(kg)
Chemical Recommended	14,715	1,541 (100%)	3,197
Max Chemical Allowed	14,715	3,632	
Chemical Usage	918	85	85

Planned Fertilisers

Fertiliser	Tonnes
Urea (46%) + NBPT	1.07
25-5-5	1.71

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NMP Online

Lime Requirements

Search:

Plot Name	Crop	Area (Ha)	Soil Sample Id	Soil Sample pH	Lime Req (T/Ha)	Advised Lime 2020 (T/Ha)	2021 (T/Ha)	2022 (T/Ha)	2023 (T/Ha)
13	2 Cut + Grazing	4.5	36	6.0	2.5	2.5	0.0	0.0	0.0
16	2 Cut Silage	2.9	33A	5.4	10.0	5.0	0.0	5.0	0.0
17	2 Cut Silage	3.5	33B	5.2	11.3	6.0	0.0	5.0	0.0
001	Grazing	2.1	56	6.5	1.5	0.0	0.0	2.5	0.0
002	Grazing	2.0	55	6.0	2.5	2.5	0.0	0.0	0.0
003	Grazing	1.9	54	5.0	12.0	6.0	0.0	6.0	0.0
004	Grazing	1.7	53	6.1	1.5	0.0	0.0	2.5	0.0
005	Grazing	3.3	52	6.3	1.5	0.0	0.0	2.5	0.0
007	Grazing	1.6	50B	6.2	2.5	2.5	0.0	0.0	0.0
008	Grazing	3.3	50A	5.6	6.0	4.9	0.0	2.5	0.0
					Annual Totals (tons)	175	0	97	0

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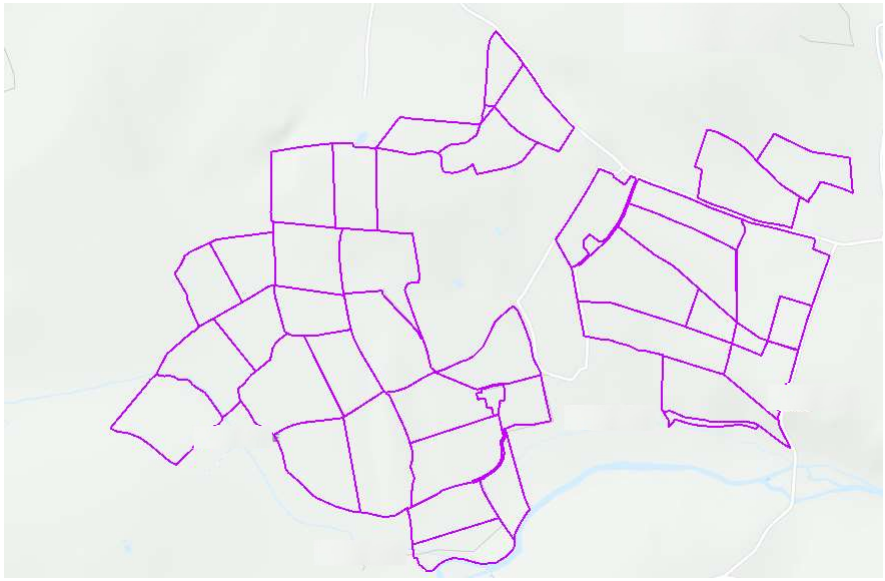
Farm Map



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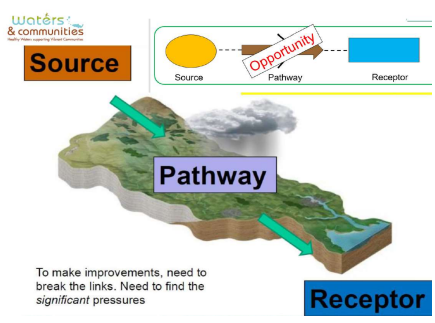
What Causes Diffuse P & Sediment Loss?

1. Most losses from low permeability soils
2. Heavy rainfall leads to **overland flow of water**
3. P and soil sediment washed off into drains & streams



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Fertiliser planning and Critical Source Areas (CSA's)

- Critical Source Areas (CSA's) are areas that are at highest risk of impacting a water body.
- Often low-lying parts of farms where runoff accumulates in high concentration.
- Runoff from CSA's carries sediment and nutrients (N & P) to waterways.
- Identification of CSA's necessary to reduce nutrient, sediment and pesticide losses.
- Important to apply appropriate farm management practices

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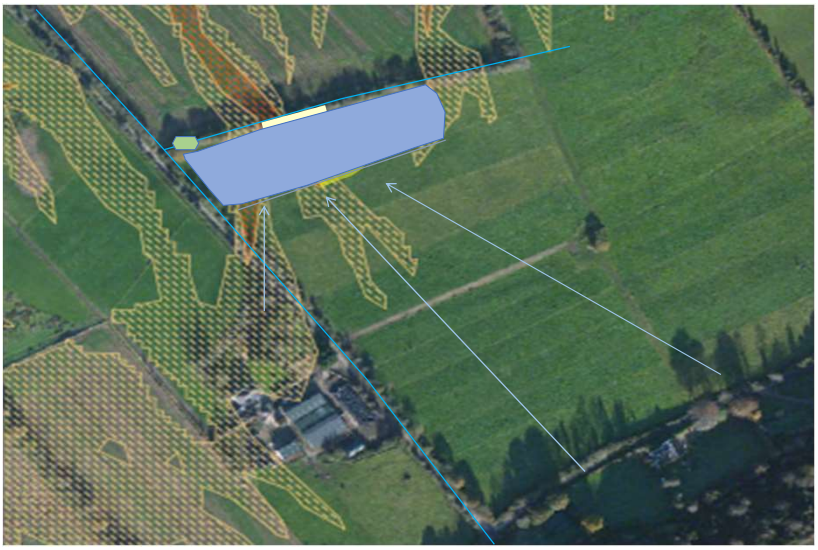

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Pollution Impact Potential (PIP-N) Maps - Nitrogen

- Map identifies diffuse N losses.
- The darkest purple areas (PIP rank 1) show the farmland with the highest risk for diffuse N losses.
- Lighter colours indicate lower risk land for diffuse N loss
- High risk areas often coincide with free draining land

PIP map for Nitrogen.
Source EPA and OSI

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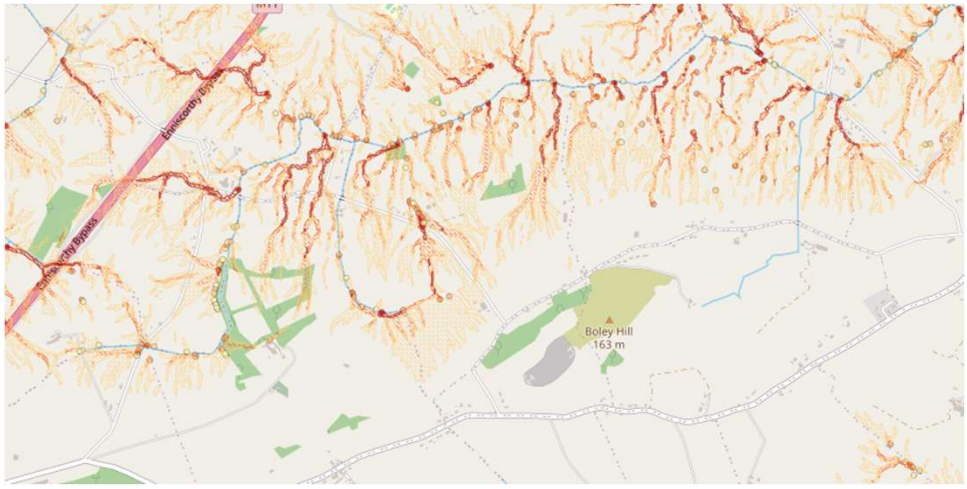
Overland flow pathways and delivery points



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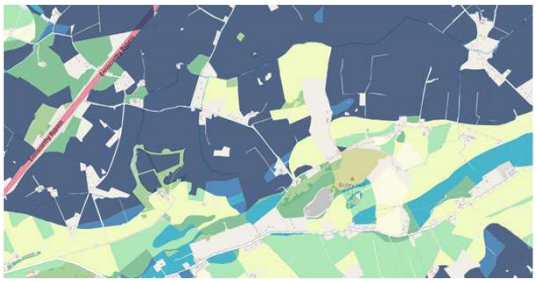
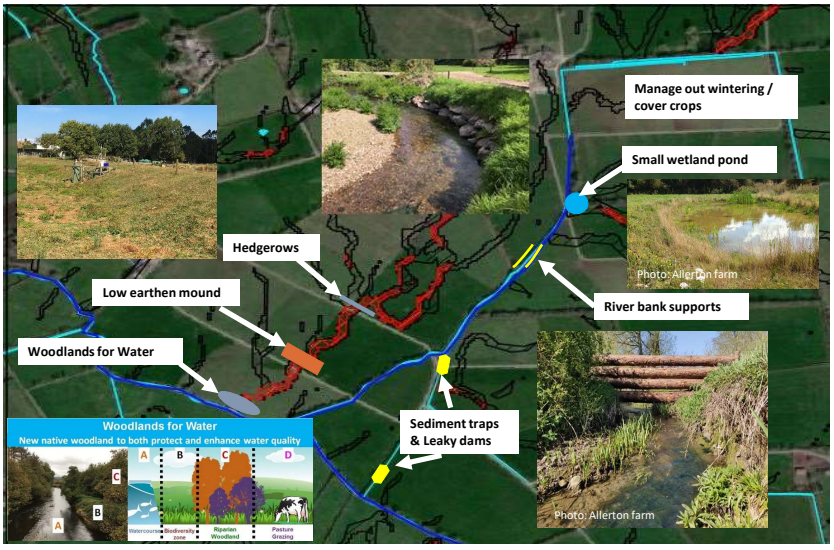
Pollution Impact Potential (PIP-P) Maps

- PIP maps developed by the EPA
- Help focus on the areas and sources that might be impacting water quality.
- Help identify diffuse P and diffuse N losses.
- The darkest blue areas (PIP rank 1) show the farmland with the highest risk for diffuse P losses.
- High risk areas often coincide with poorly drained land



PIP map for Phosphorus. Source EPA and OSI

93



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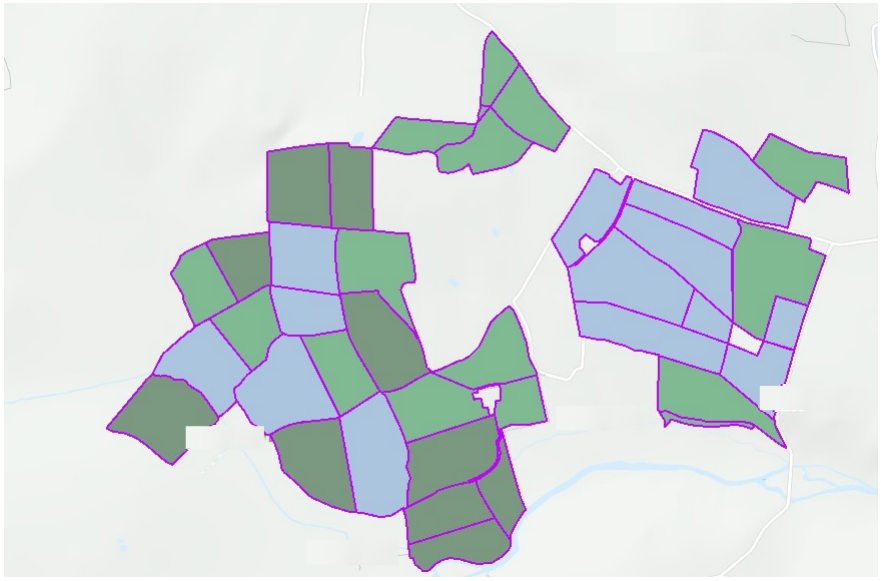
Farm Map pH



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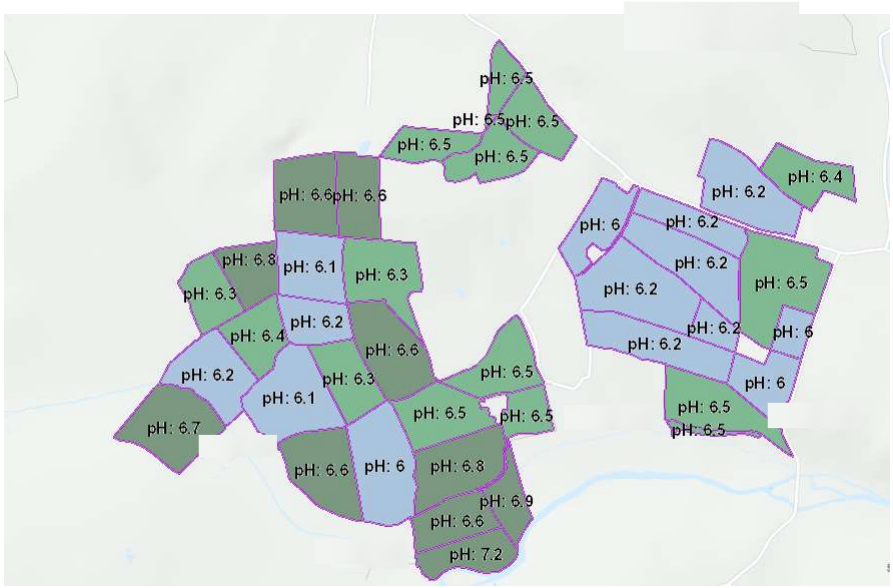
Farm Map pH



96

Farm Map P

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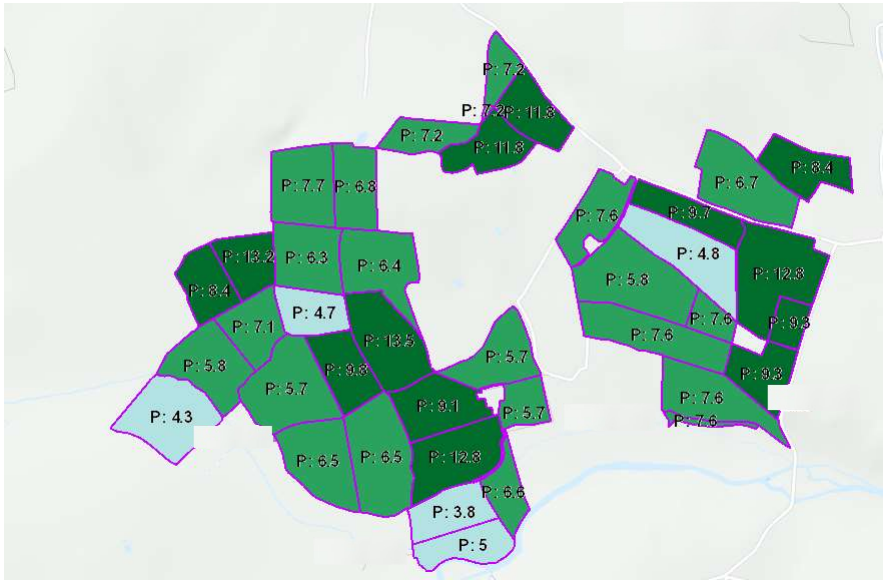
Farm Map P



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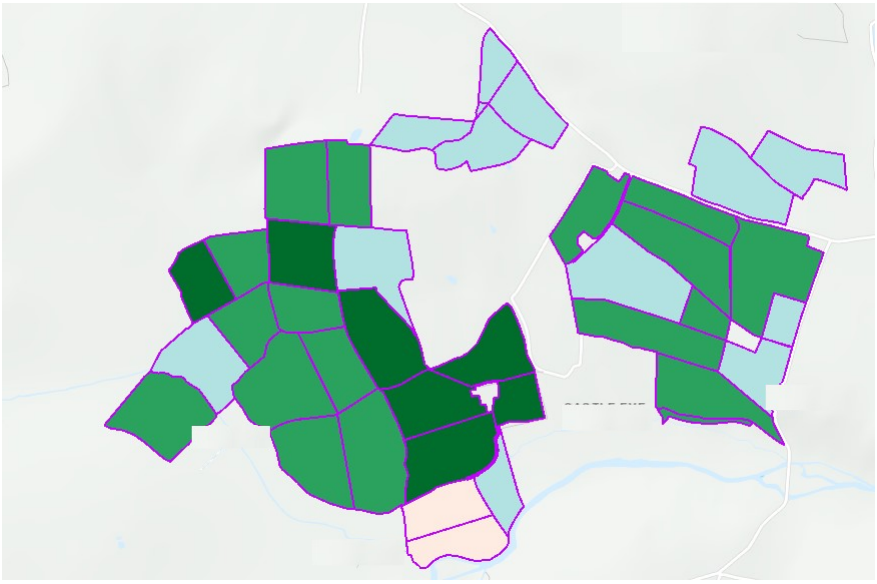
Farm Map K



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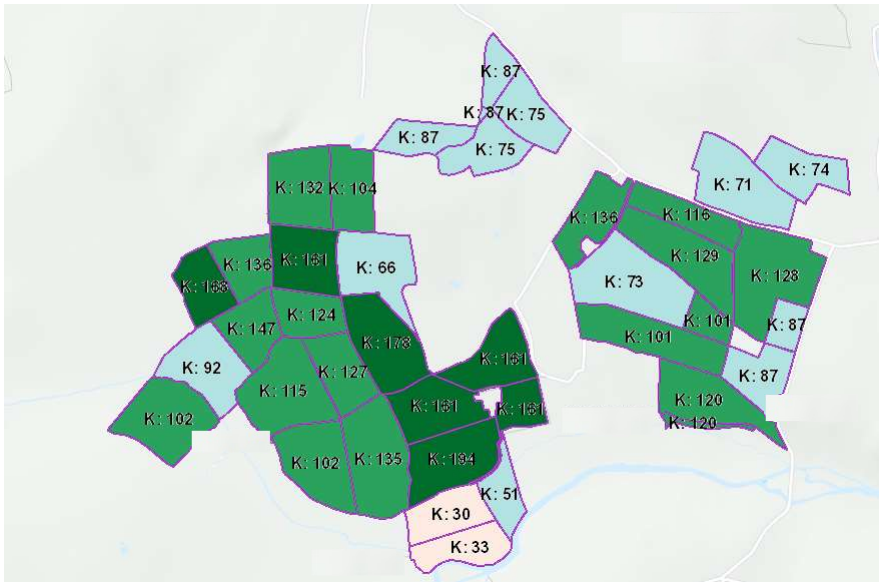
Farm Map K



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Technology doesn't replace

- It supports
- You still make the decisions
- Technology can help you monitor whether you are making the right decisions or not





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Key Messages

•Use your NMP to:
- •Value for your investment in soil fertility,
- •Increasing grass growth,
- •Reducing inputs,
- •Water quality,
- •Reducing GHG's / Ammonia

- Full set of well taken soil samples, a fertiliser plan that takes soil type into account, use the maps to target soil fertility,

- Sustainable Fertiliser Plan





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Thank you

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