



Outline

- Soil Fertility Management
- Soil Sampling
- Liming
- Sulphur
- Fertiliser programmes – Getting grass going this spring

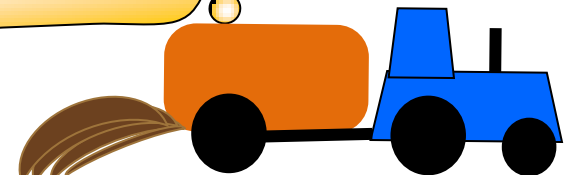
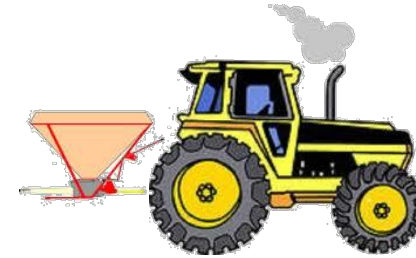
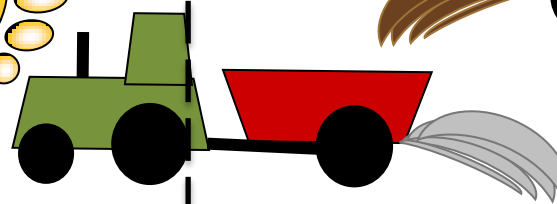
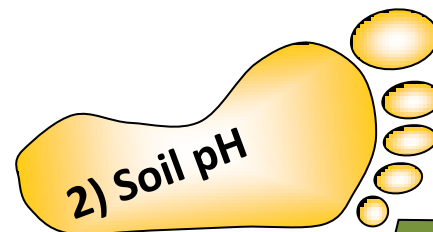
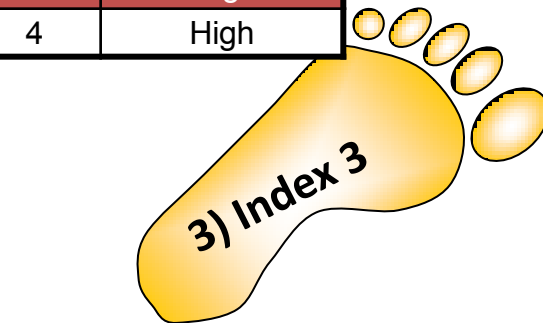
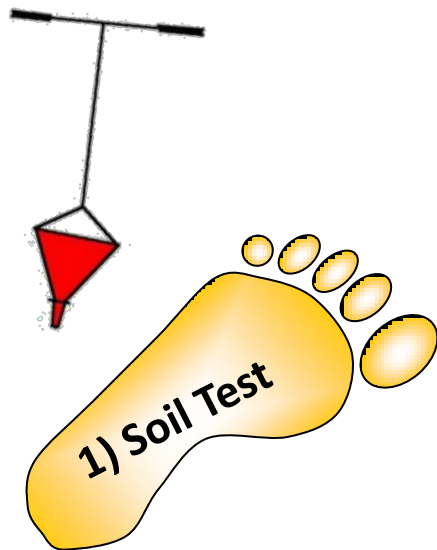
Steps to Soil Fertility Management



Information

Interpretation

Index	Description
1	Very Low
2	Low
3	Target
4	High



Action



SOIL SAMPLING



Soil Testing – Why?

- Indicator of background soil fertility levels
 - Soil pH and Lime requirement
 - P & K
 - Mg and trace elements
- Tool to help plan nutrient applications
 - Fertilizer
 - Slurry / FYM
- Monitor change in soil fertility levels overtime
 - Adjust fertilizer / manure management practices
- Derogation requirement

2012 Survey –





Only 41% of samples are used for fertilizer planning
Mainly used only for cross-compliance

**Soil Test for yourself
- Not for the Inspector !!!!!**



Soil Testing - Information

- Basic Test
 - Soil pH
 - Lime requirement
 - Soil phosphorus (P)
 - Soil potassium (K)
- Extras
 - Magnesium
 - Trace elements

Index	Description		Morgan's P (mg/l)	Morgan's K (mg/l)
1	Very low		0-3	0-50
2	Low		3-5	51-100
3	Target		5-8	101-150
4	High		>8	>150

No soil test for
➤ Nitrogen
➤ Sulphur

How to soil test

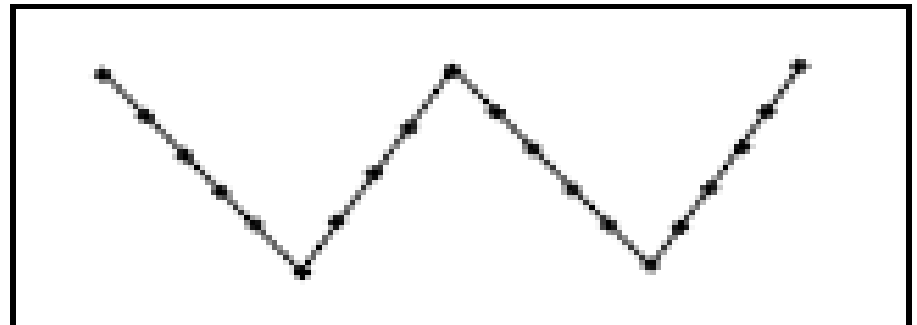


How

- Divide farm into representative areas
- Management units
- Similar:
 - History
 - Soil / slope
- Different:
 - Possible/Practical to implement different programme
- 2-4 ha (5-10 acres units)

Remember

- Representative sample
- Keep a good record of the soil labels from each field
- Ideally on a map





Soil Testing – When?

- How often:
 - Every 3-5 years (4 years if in derogation)
- Timing:
 - For comparison, sample at same time of year
 - Avoid extremes (Very dry / waterlogged)
 - Late Autumn / Early Spring ideal
 - Results ready for fertilizer planning for the coming year



Fertilizer P & K
At least 3 months



Slurry / FYM
At least 3 months



Lime
2 years
(for accurate soil pH)



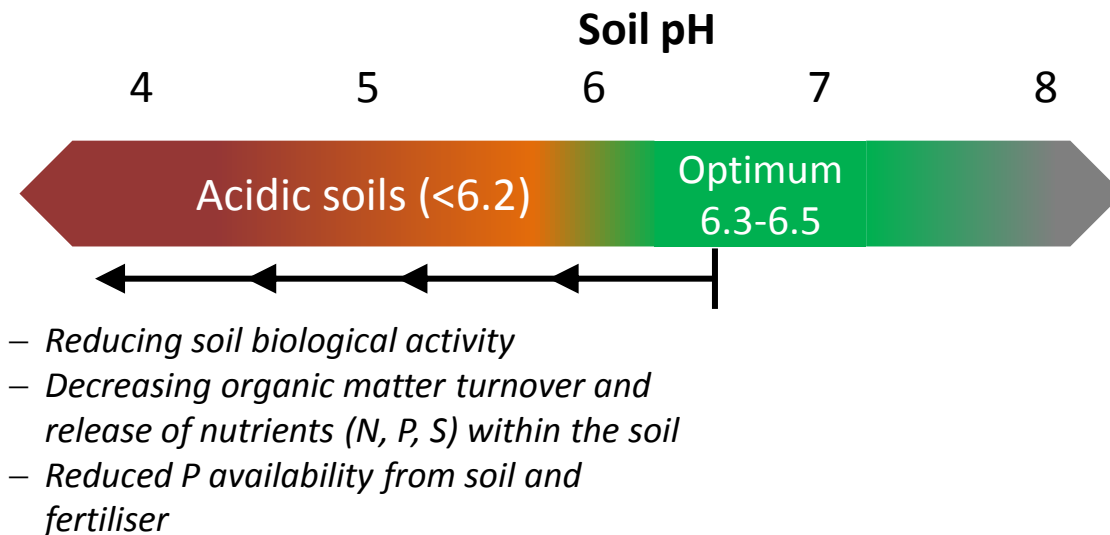
Soil pH - the foundation for a fertile soil

LIME



Lime – Why?

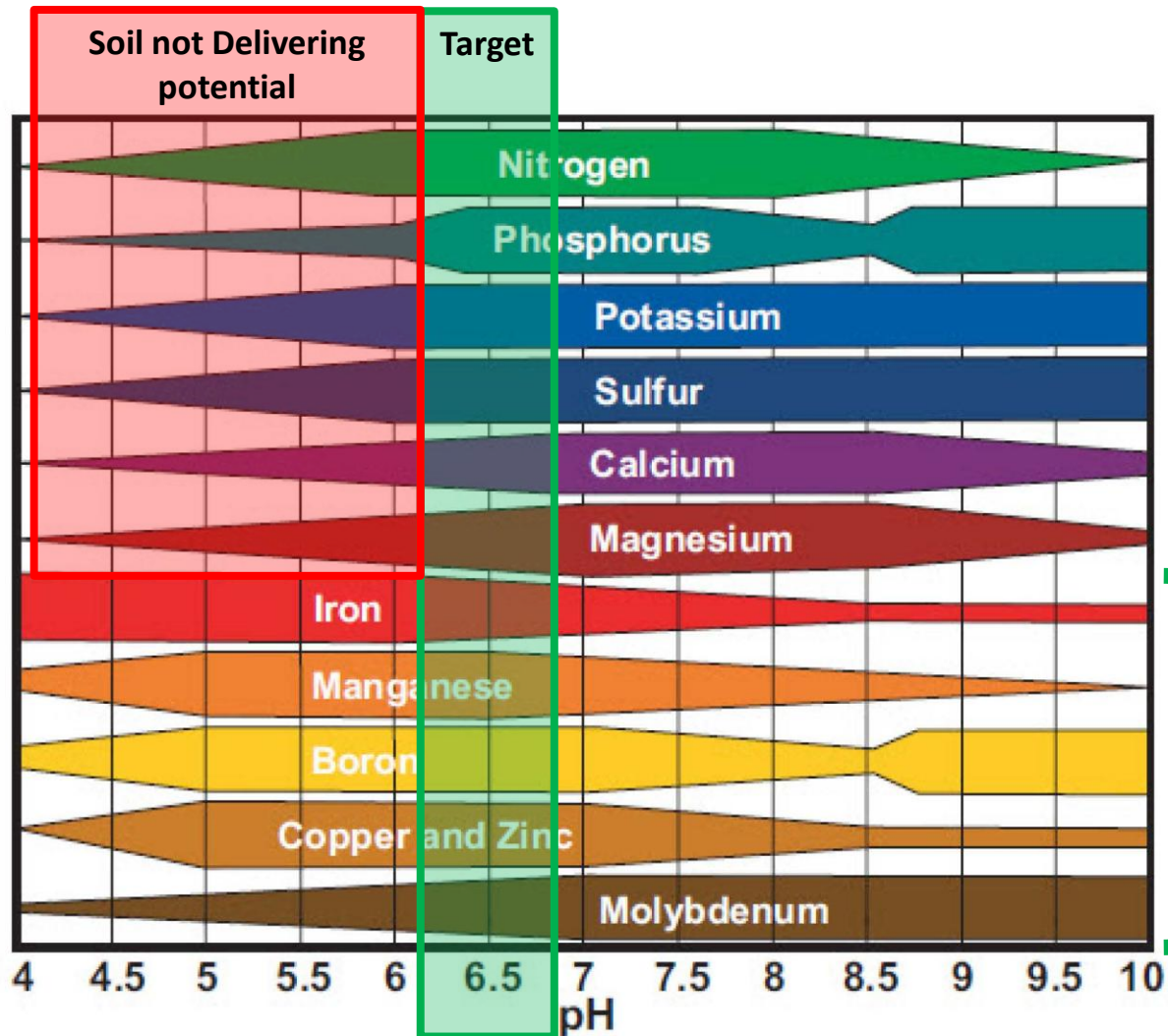
- Soils in Ireland are naturally acidic
 - High rainfall washes out alkali/basic elements (Ca, K, Mg, Na)
 - Fertiliser uptake and soil organic matter breakdown also produces acidity



- Lime neutralises this acidity and improves the soil pH



Soil pH and nutrient availability



Over-liming
can affect
trace element
balances



If soil pH is too low.....

- Lower release of natural soil fertility
 - Biology: release of nutrients from soil organic matter
 - Chemistry: Availability of nutrients (esp. P)
- Poorer response to NPKS applied
 - Grass less well geared for growth and uptake
 - Lock up by the soil (esp. P)
- Ryegrass persistence in the sward
 - Higher reseeding costs



Lime types

- Ground limestone
 - Apply as per Lime requirement
 - Calcium based
 - Standard product
 - Magnesium based
 - Use where Magnesium in the soil test is low

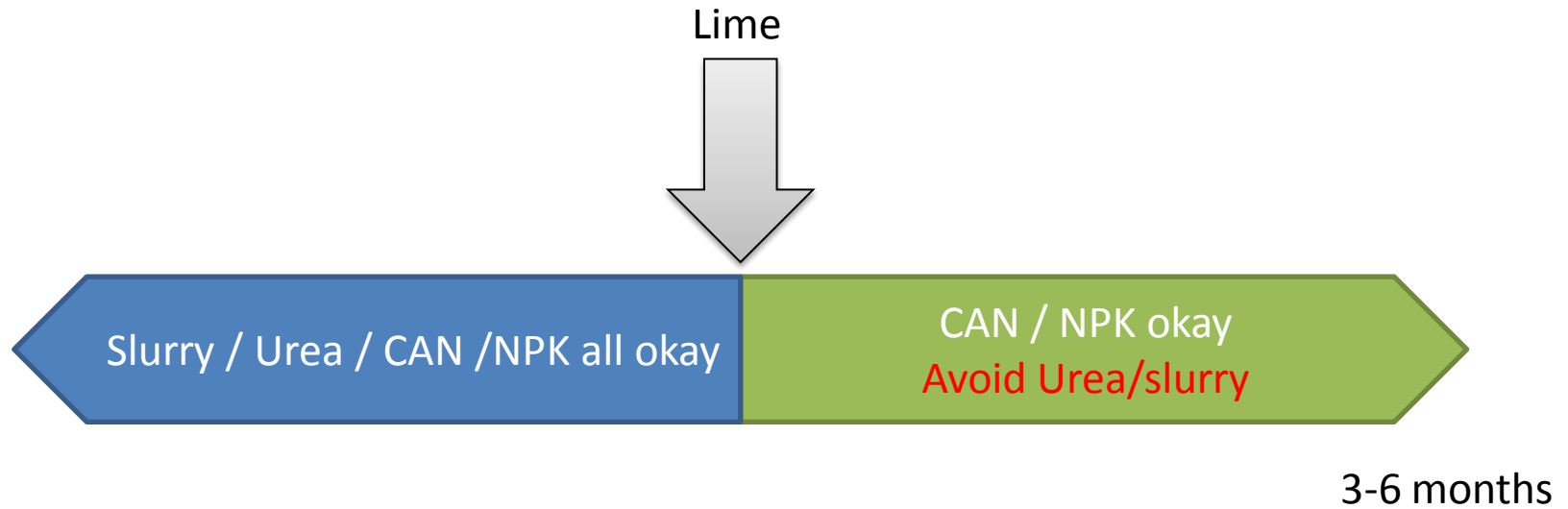


- Granulated limes
 - Similar material, just more finely ground
 - More expensive
 - pH maintenance (convenience)
 - Rented ground



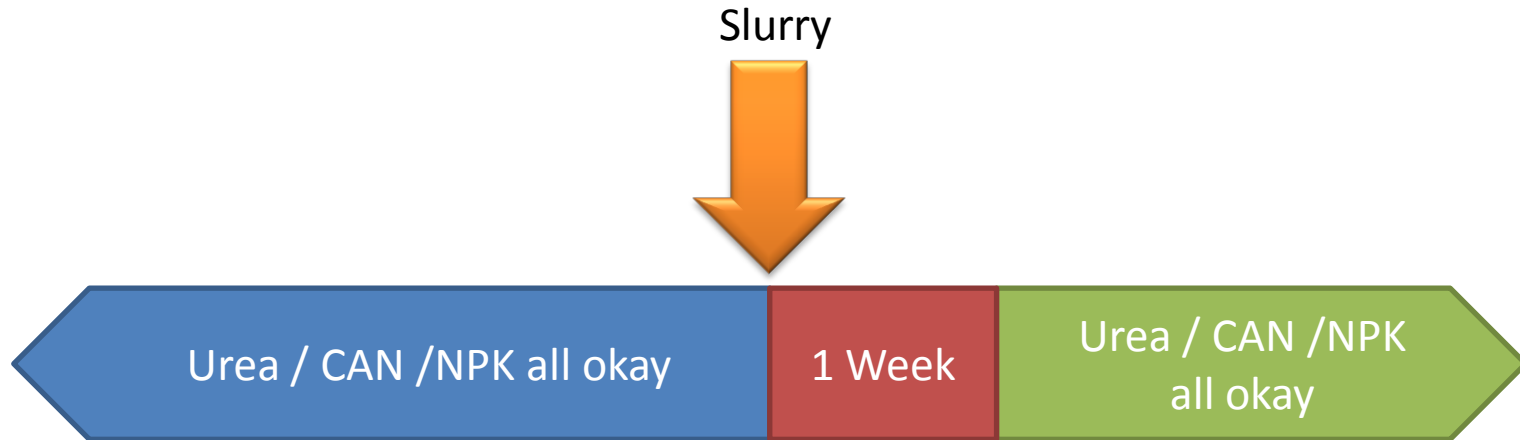


Lime, Slurry and Urea interactions





Lime, Slurry and Urea interactions





OR



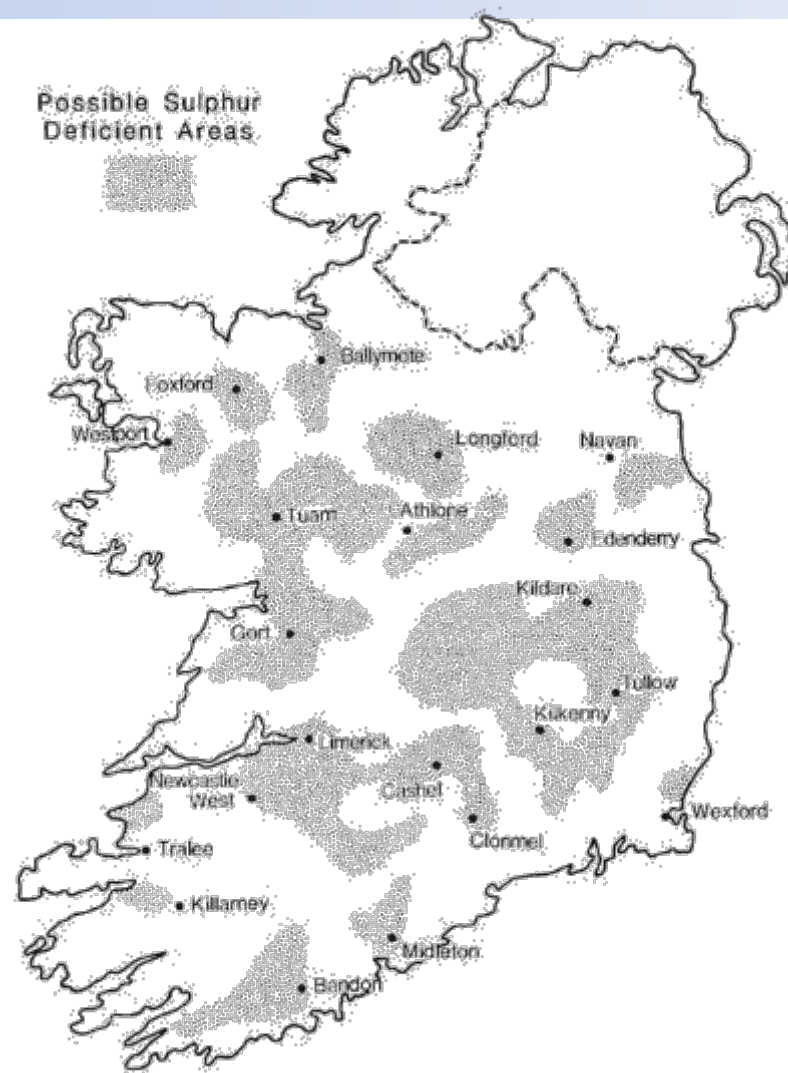
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SULPHUR

Sulphur



- Works with Nitrogen to make protein
 - Balance:
every 13 units N needs 1 unit S
- > 30% of Irish soils require S for optimum yield
- No soil test
- Soil texture
 - Light texture (>50% sand)
 - Low organic matter (<3% org C)



Response to Sulphur occurring now more widely
→ reducing atmospheric sulphur



Sulphur – Yes / No

Yes

- ✓ Essential nutrient to allow Nitrogen to work properly
 - Grass yield
 - Protein quality

No

- ✗ Risk negative interaction with Copper and Selenium to cause deficiencies in animals

Risk Management (if using S for first time):

- Little & often during the grazing season
- Only apply recommended rates
- Awareness of Cu or Se issues & supplement animals to reduce the risk

Sulphur	Grazing	Silage
	per yr	per cut
kg/ha	20	20
<i>units/acre</i>	16	16

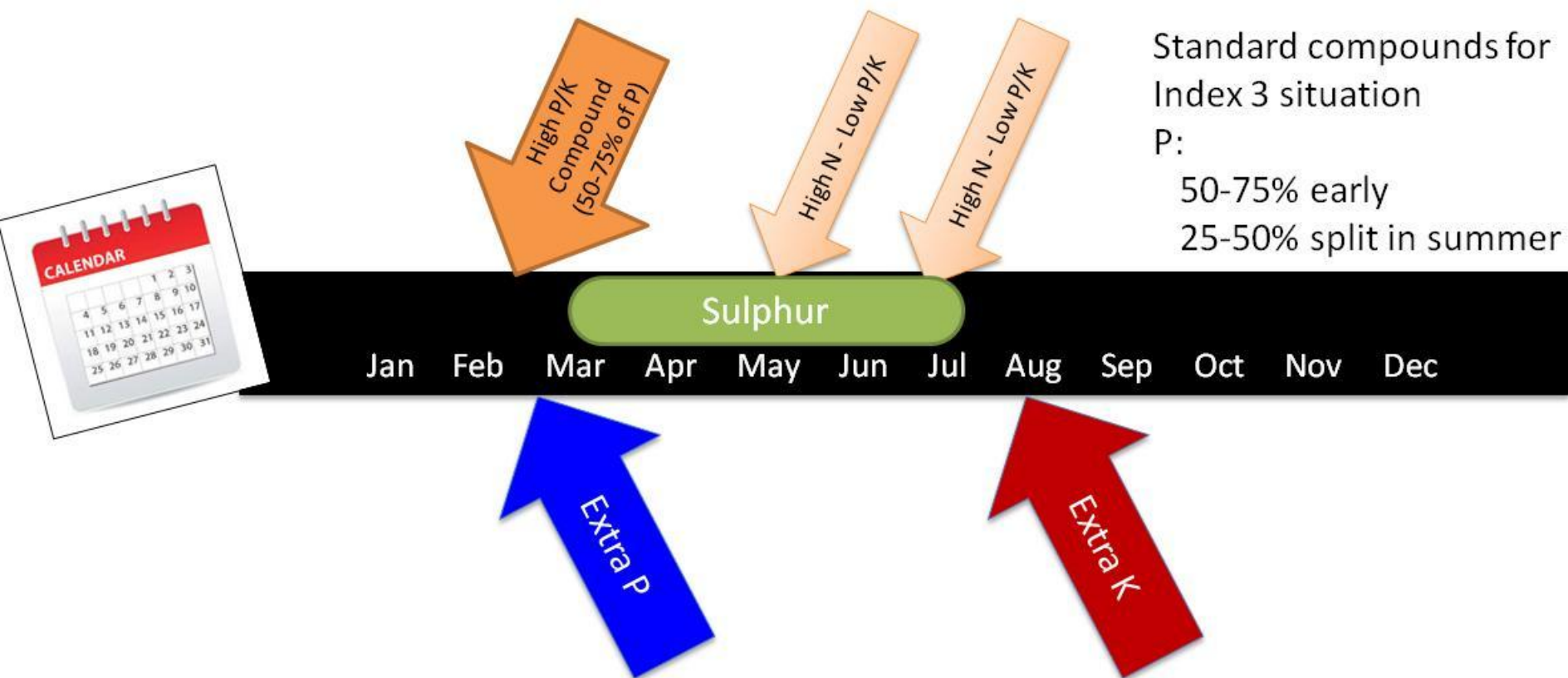


Getting Grass moving this Spring

FERTILISER PROGRAMMES



Fertiliser programmes (P K S timing)





N Timing (units/acre)

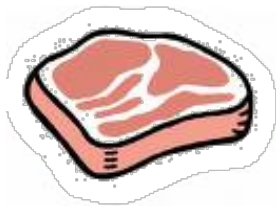
Stocking rate units/acre									
LU/ha	Jan/Feb	Mar	Apr	May	June	Jul	Aug	Sept	Total
<1.0			20		12				32
1.25		12	24	12		12			60
1.5		22	28	20		18			88
1.6		22	28	20	14		14		98
1.8		22	35	21	21		14		113
1.9		23	35	28	28		21		135
2.0		27	42	34	34		25		162
2.1	26	26	38	30	30		22		172
2.2	25	33	43	30	30		30		191
2.4	24	42	42	30	30		30	22	220
2.5	25	43	43	45	30		30	30	246
>2.5	26	39	44	30	30		30	22	221



P & K advice – replacing offtake



Stocking Rate (LU/ha)	< 1.5	1.5-2.0	2.0-2.5	2.5-3.0	> 3.0
Dairy	P – K advice				
kg/ha	10 - 25	14 – 30	19 – 35	23 – 40	27 – 45
units/acre	8 - 20	11 – 24	15 – 28	18 – 32	22 – 36



Stocking Rate (LU/ha)	<1.0	1.0-1.5	1.5-2.0	2.0-2.5	2.5-3.0
Beef/Sheep	P – K advice				
kg/ha	4 – 5	7 – 10	10 – 15	13 – 20	16 – 25
units/acre	3 – 4	6 – 8	8 – 12	10 – 16	13 - 20



P & K advice – replacing offtake



Cut	First	Second
	P – K advice	
kg/ha	20 – 125	12 – 75
<i>units/acre</i>	<i>16 – 100</i>	<i>10 – 60</i>



Build-up	Index 2	Index 1
	P – K advice	
kg/ha	+ 10 – 30	+ 20 – 60
<i>units/acre</i>	<i>8 – 24</i>	<i>16 – 48</i>

Slurry Dry Matter Content

1 %

DM



3.5 %

DM



7 %

DM



✓ Silage

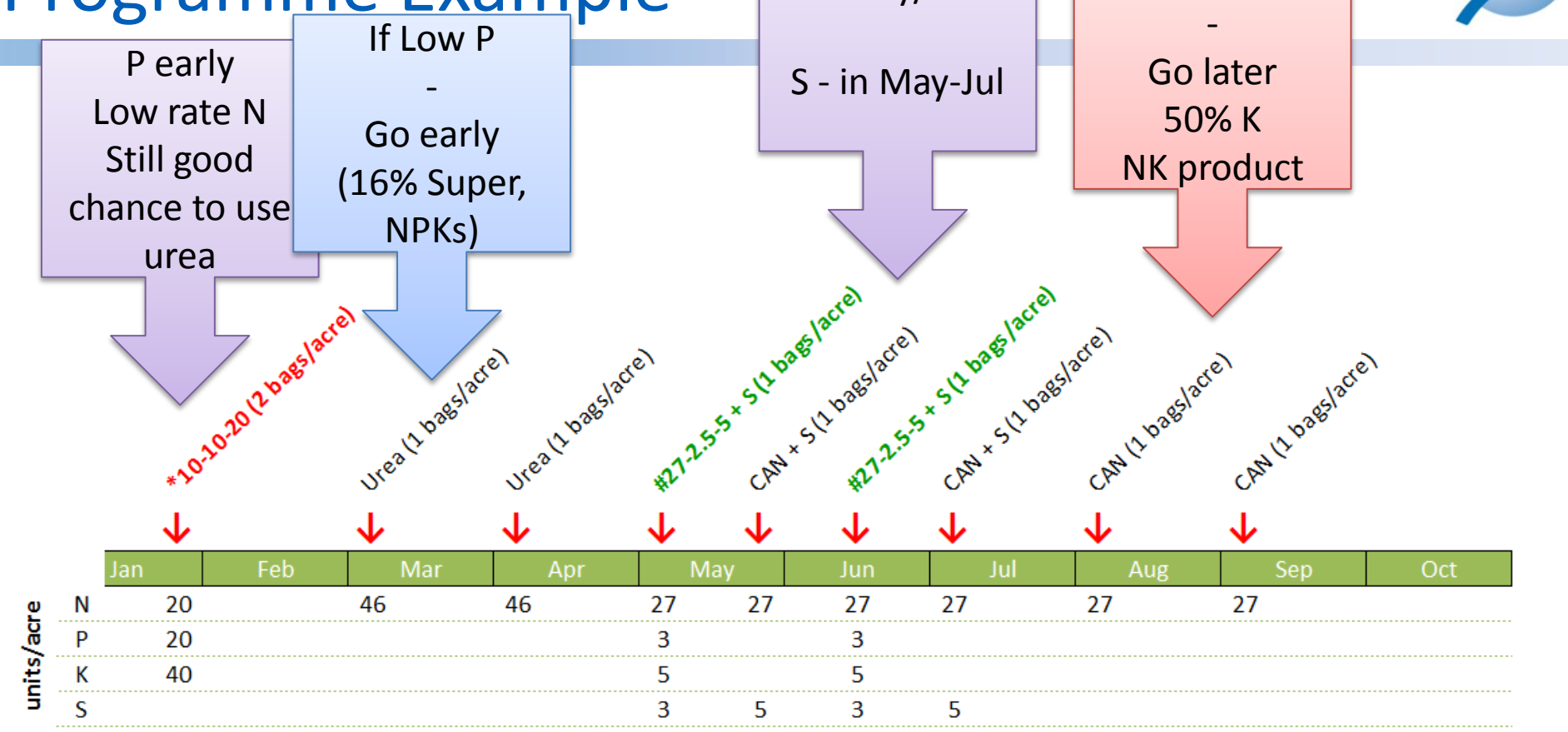
*1000 gals of 7% DM slurry
per 0.7 t of silage DM
(4 bales of silage)*

✓ Grazing – soil with low K

- Hot / dry weather → **- 3 units** N
- Trailing shoe / Bandspreader → **+ 3 units** N



Programme Example



Total (Units/acre)	
N	274
P	25
K	50
S	16

Annual Total Product		
*10-10-20	2	bags/acre
Urea	2	bags/acre
#27-2.5-5 + S	2	bags/acre
CAN + S	2	bags/acre
CAN	2	bags/acre

4 bales / 0.7 t DM = 1000 gals slurry



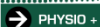
Grassland AGRO

ENHANCED FERTILISER TECHNOLOGIES



Grassland AGRO

PHYSIOLITH



PHYSIO+



N-PROCESS



PHYSACTIV

Soil Conditioners

Root stimulation & nutrient uptake

Calcium nutrition

Soil biology and structure

Soil surface pH maintenance

Phased Released Nitrogen

Lower N losses in poor weather

More reliable grass growth response

More palatable grass

Higher quality silage

Protected Phosphorus

Less P lock-up by the soil

Higher P availability for a longer time period

Plant and soil biological stimulation

Enhanced P efficiency on low pH soils

Complete Range of N, P & K fertilisers with Calcium, Sulphur, Magnesium & Sodium to suit your specific requirements



Fertiliser programme - Considerations

- Soil pH – lime required
 - Mg status → choice of lime
- Total N/P/K/S requirements
 - Stocking rate
 - Cross check for Nitrates, (incl. concentrate feed)
- How slurry can be best used
 - Low K (& P fields).... Usually silage
- Balance = chemical fertiliser



Fertiliser programme decisions

- Early P + summer drip feed
- Back load K if needed for build up (avoid > 70 units/acre in spring)
- Drip feed Sulphur
- Nitrogen out in front of grass demand
- Fertiliser product choice/cost (e.g. Maximise use of urea in the programme)
- “Unknown silage areas” – maintenance plan to replace P and K removals
- Keep it simple
 - 1 product per application timing on any field
 - As few products as possible on the shopping list