Getting Soil Fertility Right through Strategic Fertiliser Use

Dairygold Dairy Day 2018

Corrin Mart, Fermoy

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Grassland AGRO

dairygold

Golden Valleys, Growing Naturally

AGRI BUSINESS

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- Standard Fertilisers – Full Range
- Enhanced Products – Specific Soil / Nutrient Challenges
- Technical Advice & Fertiliser Planning
- Internal Trials Programme
- National Programme Support

Quick Outline

- Linking Soil to the Bottom Line
- Key Targets for Soils & fertiliser
  - What are we trying to achieve ?
- Getting the basics right
  - Lime / Slurry / Sulphur / P / K / Nitrogen
- P & K to grow 15 tonnes of grass DM
- A Simple Fertiliser Plan
- Different approaches
  - Soil Condition
  - Phosphorus

Linking Soil to the Bottom Line

Productive soils are the foundation of any successful farm system

Therefore, the management of soil fertility levels should be a primary objective on any farm

Healthy Soil → 3-legged Stool

3 essential components:

***Physical*: What we see**
(Structure, Strength, Drainage)

***Chemical*: What we test**
(Organic Matter, Soil pH, Nutrients: Total & Available)

***Biological*: What is alive**
(Earthworms, Bacteria, Fungi, Plants, Nutrient Cycles)

Soil Conditioning:
→ Optimises these 3 functions

5 Steps – Actions & Targets

	Action	Target
1) Soil Test	• Take soil samples every 2-3 years • **Use soil samples**	• Have soil analysis results for every field
2) Lime & soil pH	• Apply lime as a priority where required	• Soil pH in all fields should be > 6.2
3) Soil P & K Index	• Compare P and K levels and indices on soil test results between fields	• Aim to have every field in Index 3
4) Slurry	• Target slurry to fields that need it most (P/K Index 1 or 2 and/or silage fields)	• Slurry should only go to fields that has a need for the NPK in the slurry
5) Fertiliser choices	• Apply enough of every nutrient and avoid excess of any nutrient. BALANCED supply.	• Fertiliser purchases and applications based on the needs of each field rather than history

- **Higher farm Output**
- **Better return on investment in fertiliser**

Soil pH & Lime

Every Soil Fertility Management Plan should start with building & maintaining soil pH

More nutrients from the soil

Better use of applied manures & fertilisers

Lime to build

Maintain in optimum range of 6.3-6.5

Slurry Value

- ✓ Silage
- ✓ Grazing – soil with low K

3.5 %
DM

7 %
DM

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

Growing 15 t/ha of Grass DM – **P & K**

	P (Phosphorus)	K (Potassium)
Typical nutrient uptake to grow 1 tonne of grass DM	4 kg/t	30 kg/t
Nutrient uptake needed to grow 15 tonne grass per hectare	60 kg/ha	450 kg/ha
Nutrient eaten by grazing cows (80% utilized… 12 t DM intake)	48 kg/ha	360 kg/ha
Approx. % of nutrient retained by the cow (not excreted back to pasture in dung / urine).	40 %	10 %
Nutrient retained by the cows (= offtake by the cow)	**19 kg/ha**	**36 kg/ha**

When P Fixation & K Leaching are factored in:

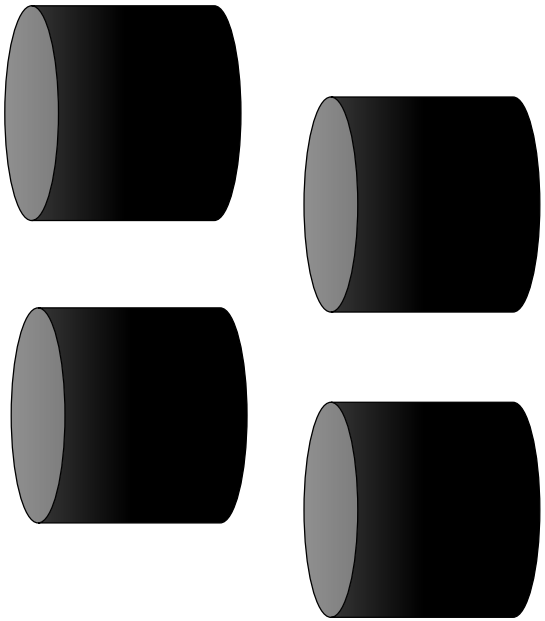
20 units/acre P 40 units/acre K

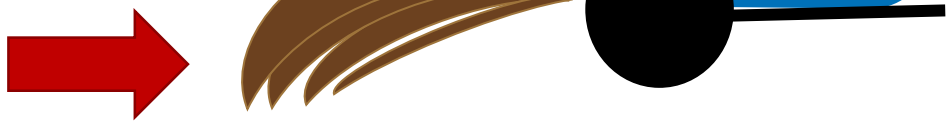
Low Soil Index:

Index 2:	+ 8 units/acre P	+ 25 units/acre K
Index 1:	+ 16 units/acre P	+ 50 units/acre K

Cutting Paddocks

4 bales of Silage = 1000 gallons Slurry

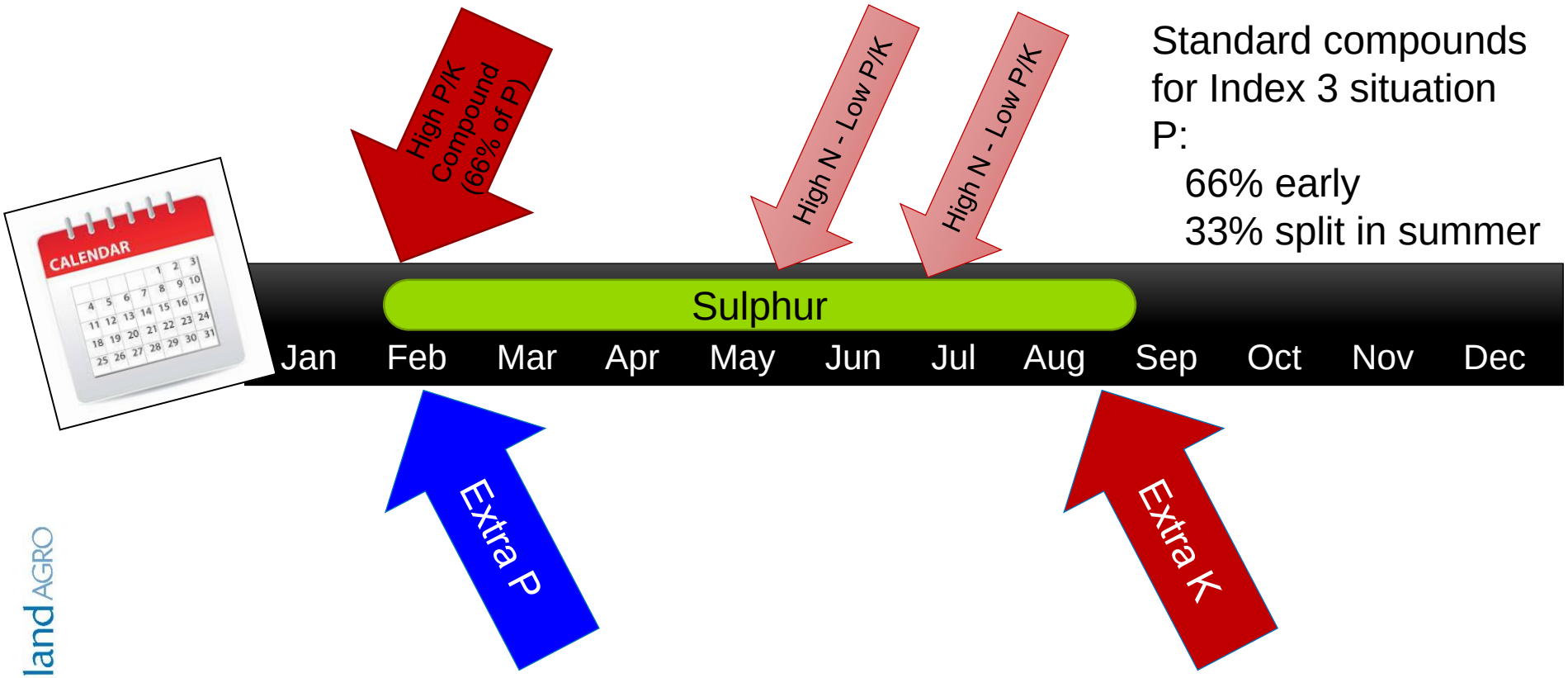




Watery Slurry…….

1000 gallons = 2 Bales

Fertiliser programmes (P K S)



Grass needs 1 unit of Sulphur to balance every 12 units of Nitrogen

Simple Annual Plan

(units/acre)		Spring	Summer	Autumn
Application Targets	N	100	80	70
	P	14	3	3
	K	28	6	6
	S	8	6	6
Program		Urea	CAN	CAN
		18-6-12	High NPK + S	High NPK + S
		Urea	CAN	CAN
Extras	Low P	10-10-20 TOP PHOS		
	Low K			MOP Slurry

- Simple plan across the farm
- Minimal number of products
- Phosphorus (P) – Spring
- Potassium (K) – Autumn
- Sulphur – Spring plus 2 (?) rounds
- Simple adjustments for Low soils

NPK for silage

	N	P	K
First Cut (5 t/ha DM)			
kg/ha	125	20	125
units/acre	*100*	*16*	*100*
Second Cut (4 t/ha DM)			
kg/ha	100	16	100
units/acre	*80*	*13*	*80*
Strong Paddocks - Every 1 t/ha DM (= approx. 2 bales / acre)			
kg/ha		4	25
units/acre		*3*	*20*

4 bales of silage requires 1000 gals slurry to replace the P & K

Annual Fertiliser Programmes - (John Farmer)

Grassland AGRO

Programme ID	1) Dairy Grazing	Crop Type(s)	Grazing (Dairy),

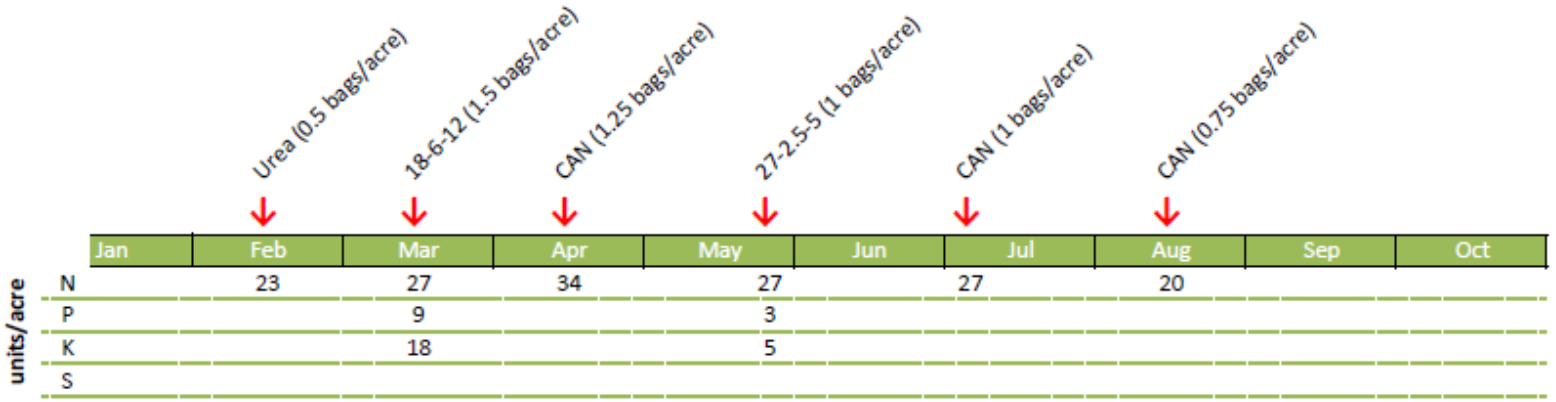
Fields receiving this programme: Dairy Grazing,

Soil Samples receiving this programme: SS 1 Dairy,

Soil pH (Weighted)	6.3
N Index (Weighted)	Grass
P Index (Weighted)	3
K Index (Weighted)	3
Total Area	20.0 acres

Nutrient Advice for these fields

	N advice	P advice	K advice	S advice
Units/acre	161	11	24	0



Total (Units/acre)	
N	**158**
P	**12**
K	**23**
S	**0**

Annual Total Product	Per Acre		Total	
Urea	0.5	bags/acre	**0.5**	Tonnes
18-6-12	1.5	bags/acre	**1.5**	Tonnes
CAN	3	bags/acre	**3**	Tonnes
27-2.5-5	1	bags/acre	**1**	Tonnes

Notes

Fertiliser advice should be cross checked against Nitrates Regulations N and P allowances on the farm.
Grassland AGRO accept no responsibility for breaches in Nitrates limits for fertiliser application.

Common Issues on Farm

Soil Condition

- Structure / Compaction
- Shallow rooting
- Sod Pull
- Surface Capping – High Slurry Application
- Maintaining good soil pH

PHYSIOLITH
PHYSIO +

Phosphorus

- Poor grass growth, especially in spring
- Soil P hard to build
- Extremes of pH (Very Low vs. High)
- Phosphorus issues in cows

PHYSALG 27
PHYSACTIV

TOP PHOS 23
TOP PHOS

TOP-PHOS

What is Physiolith ?

PHYSIOLITH
PHYSIO +

Active Ingredients

CALCIMER®
APPROVED FERTILISING MATERIAL • AMM N° 1120069

+

Marine Calcium Soil Conditioner

25.7% Ca – 0.6% Mg
Higher solubility, porosity and reactivity that conventional lime

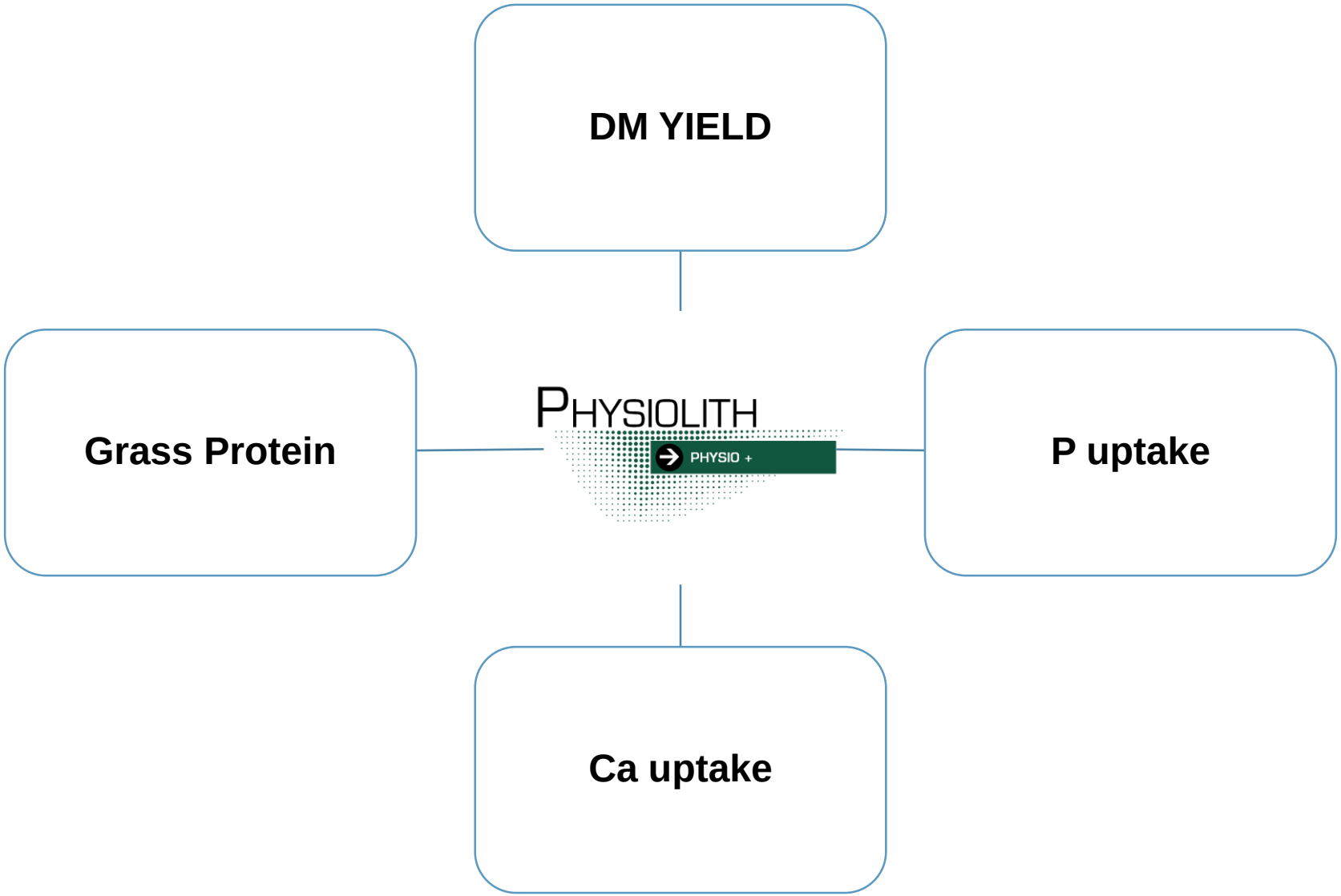
Root Stimulant

Seaweed Extracts
Plant hormone stimulation for root and plant growth and health

Similar in activity to standard lime products

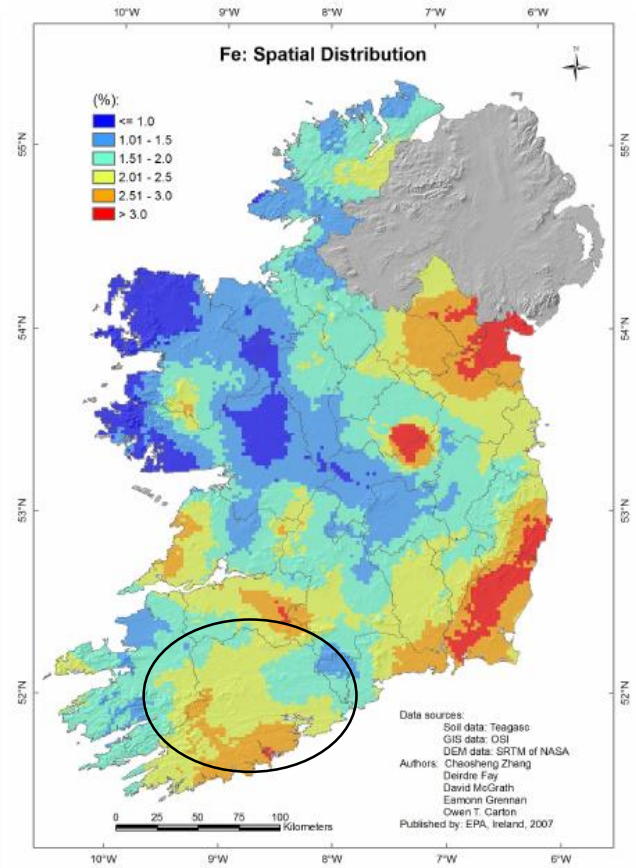
Completely Unique to Physiolith

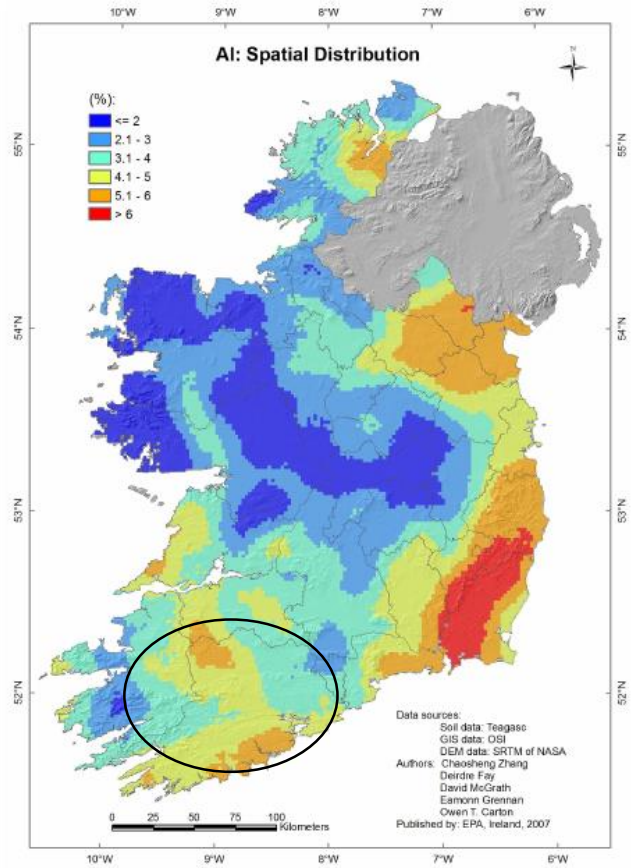
Trials with Physiolith

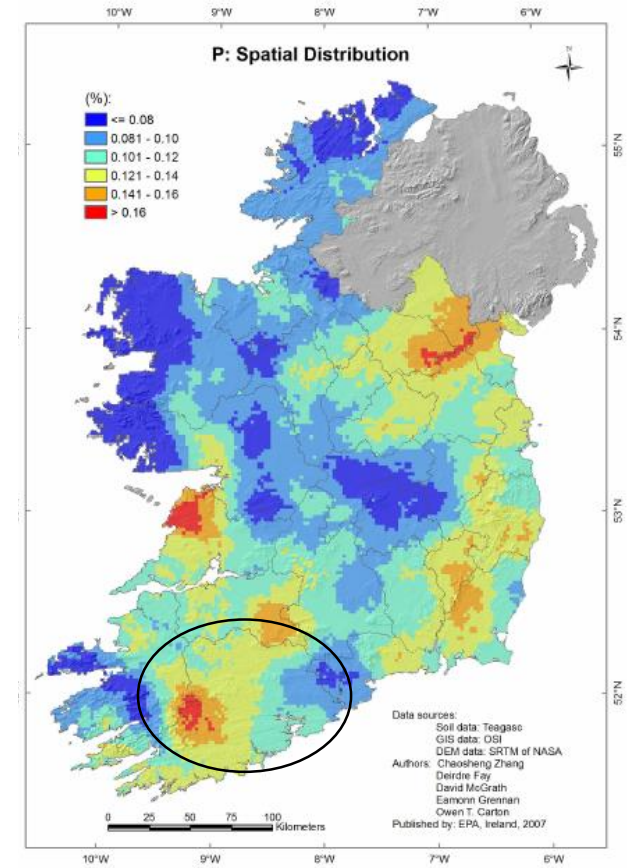


Iron / Aluminium / Phosphorus

(Teagasc – Soil Geochemical Atlas)





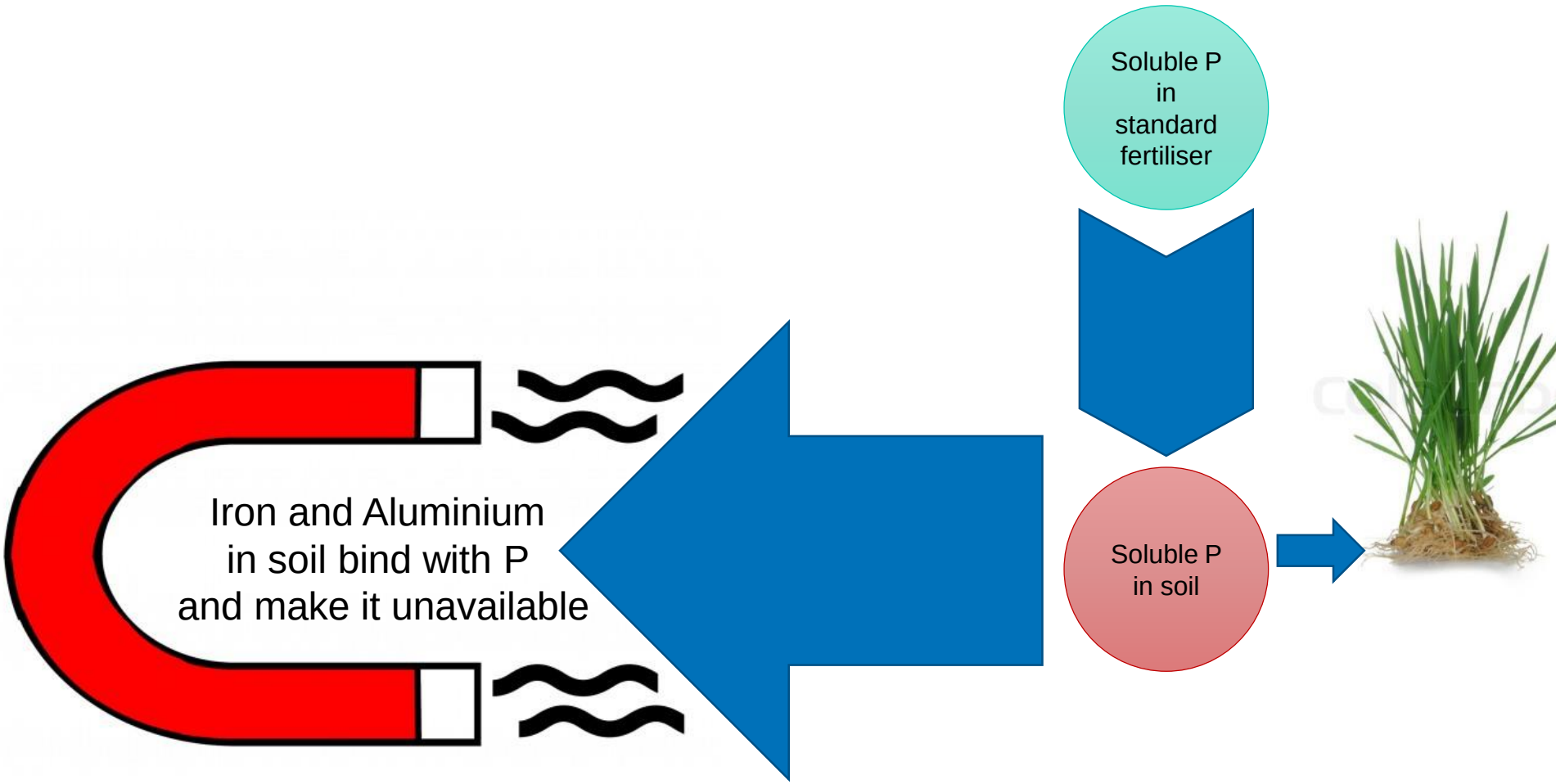


High Iron (Fe) + Aluminium (Al) in soil = High Total P

Iron and Aluminium fix a lot of P in the soil !!!!!

The P is in the ground, but it is not available

Phosphorus Fixation



PHYSALG 27

PHYSALG 27
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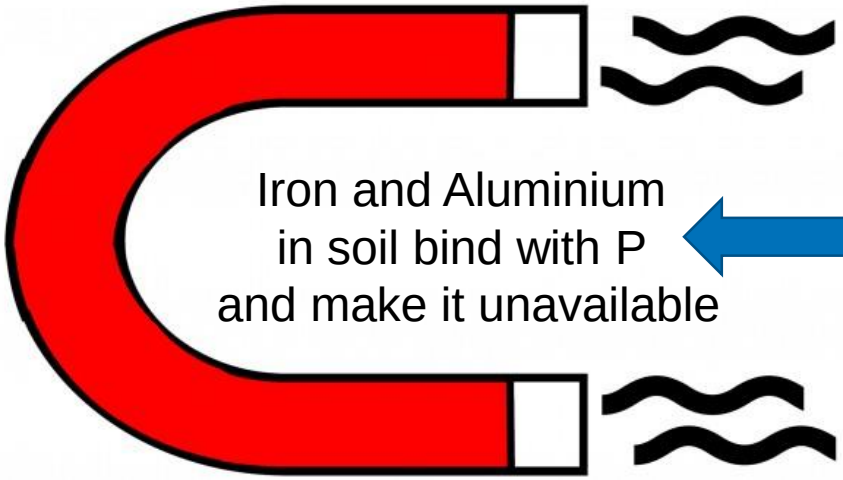
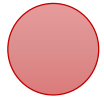


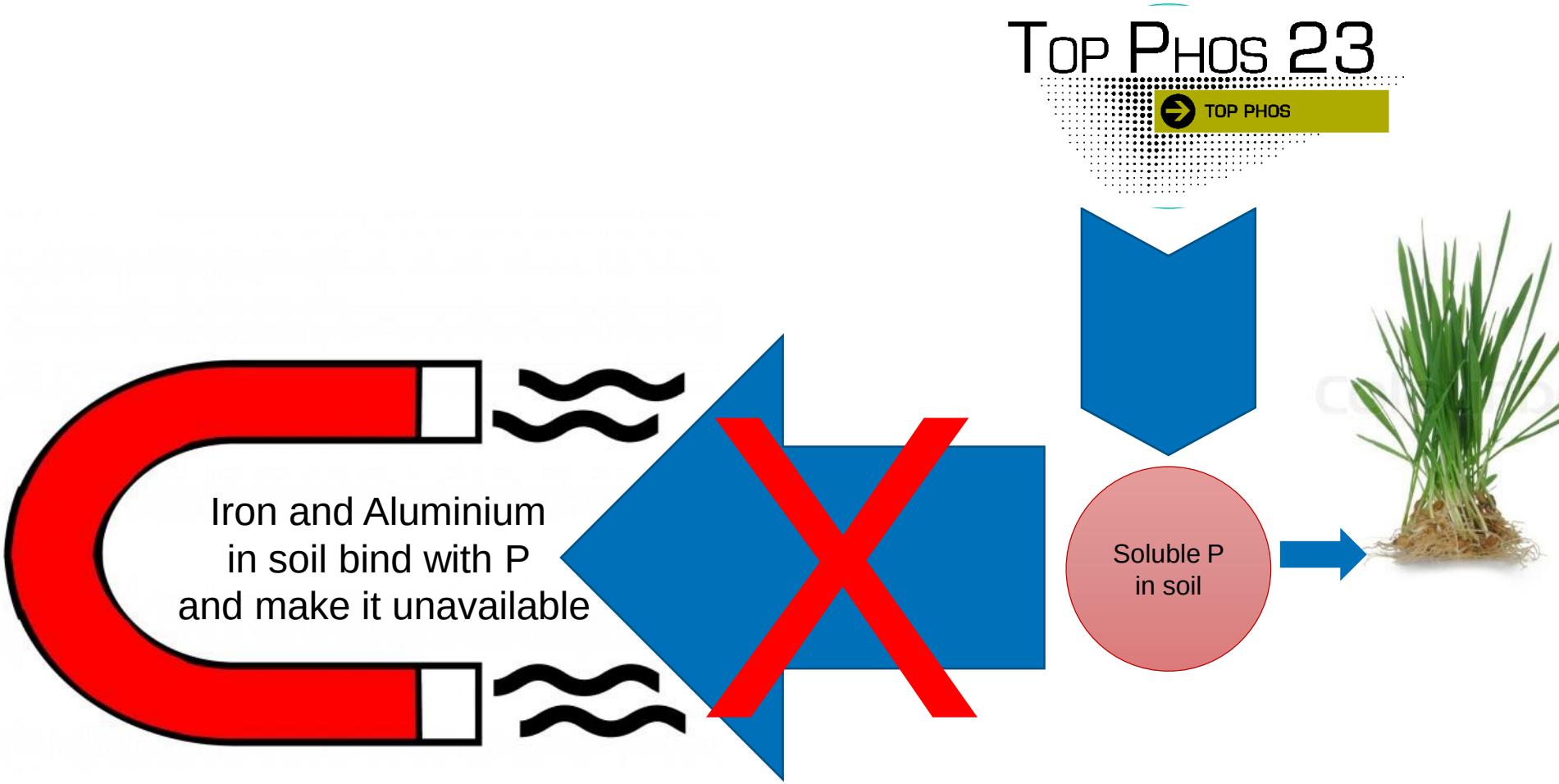
Iron and Aluminium
in soil bind with P
and make it unavailable



Soluble P from fertiliser

Release of P from the granule is slower, so the grass can compete better over a longer period.
+
Plant root and soil stimulants in the product helps the roots to get more P from the soil

TOP PHOS

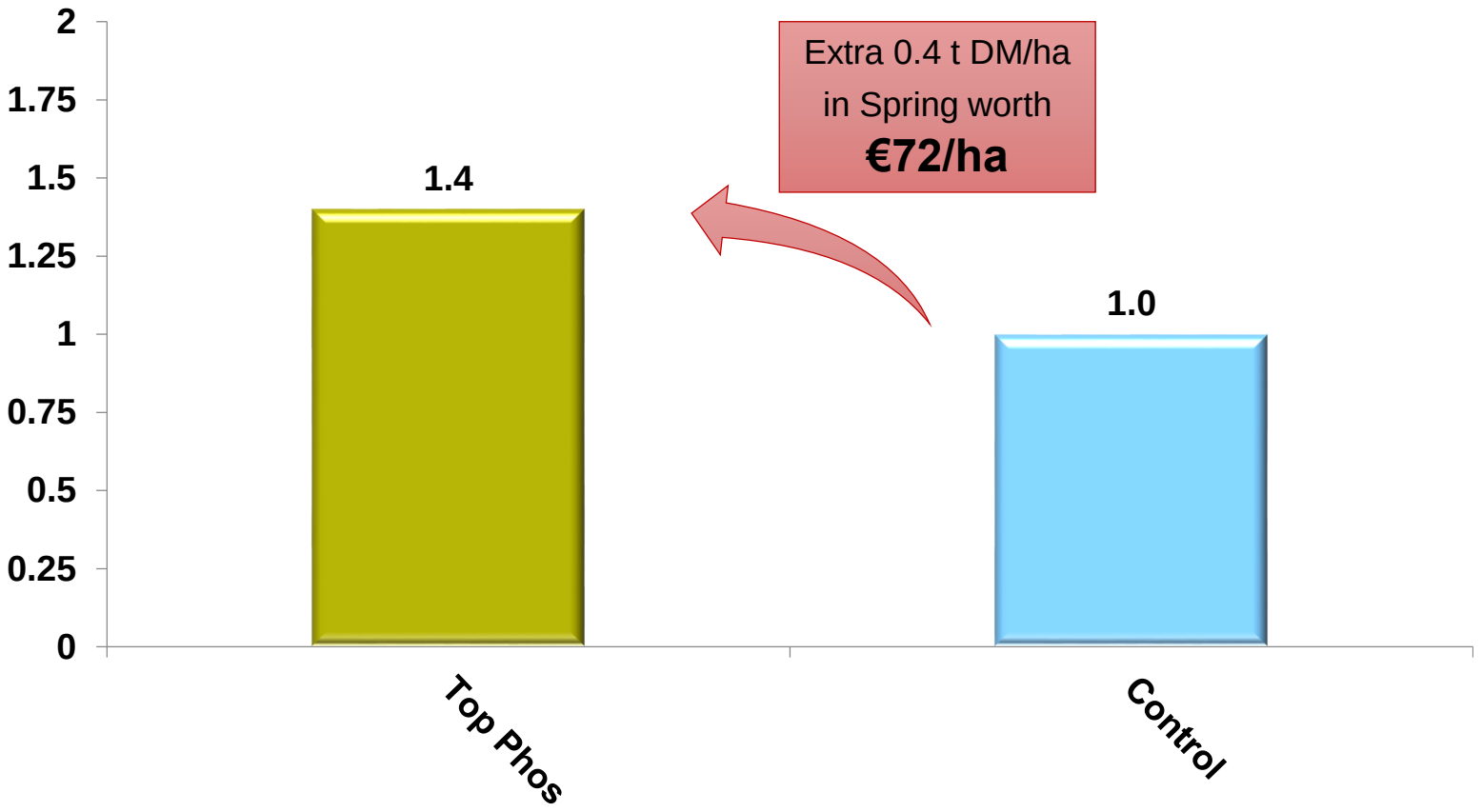


P Fixation is blocked by the Organic Binder on the TOP PHOS

- *Water soluble – Plant available*
- *More available in colder soils – Spring kick-start*

Top Phos Grazing Trial 2017 (Offaly)

Spring *(Jan- Apr)* **Yield (t/ha of DM)**



In Summary

- Get Soil results in place on which to make decisions
- Spread lime where you need it
- Get slurry to where its most valuable
- Have a fertiliser plan in place
  - Keep it simple
  - Small adjustments for low fields
  - Get P out early
  - Build K in Autumn
- Soil Condition is part of Soil Fertility
- Options with newer soil/fertiliser approaches

Thank you !!!!

ANY QUESTIONS ????????