



Keythorpe Organic Farms

The Keythorpe Herd Today

- **350 Autumn calving Holstein cows 7,500 – 8,000 lts**
- **160 < 250 Spring calving Holstein cows being bred to New Zealand genetics 5,500 – 6,000 lts**





Glebe farm 15/4/15

Paddock Grazing

Turn- out 18/02/15



A close-up photograph of a person's lower leg and foot wearing a brown rubber boot, standing in a lush green field. The field is densely packed with a mix of grass and clover plants. The lighting is natural, suggesting an outdoor setting.

In to 2800 Kg/ Ha

?



Out at 1500Kg/Ha ?

Infrastructure Key





Cut & Graze round 4 & 6/7

Grass Silage



Lucerne

- Establishment
- Quality Protein
- No Fertiliser Requirement



Red Clover

- Established in the spring
- Suppresses weeds
- Builds fertility



Fodder beet

- High yielding
- High energy
- High digestibility



Triticale



Oats

- Cover crop
- Wholecrop
- Grain





USA



Australia



Sweden



NZ

Sustainable Milk Production

The vital role of Soil for Feed Integrity



Denmark



NZ



UK

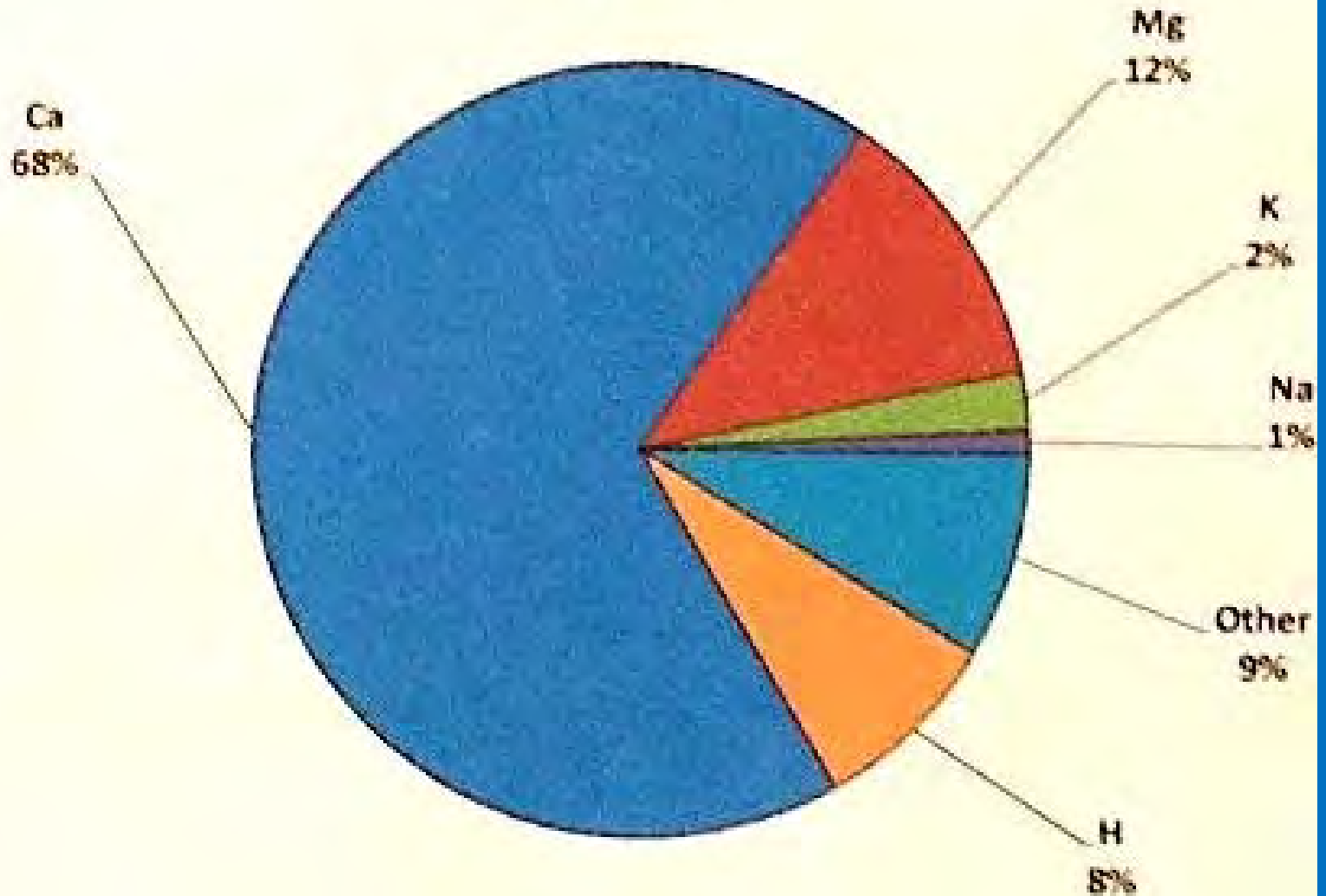


Denmark



Albrecht soil analysis

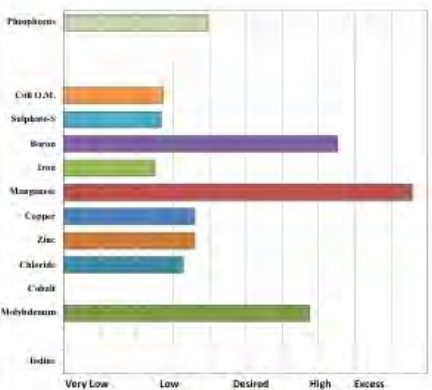
Desired Base saturation levels



Customer: [REDACTED] Farm: ACRE WALK FARMS Advisor: Ian Robertson 0165312

FIELD ID: Paddock	THA/E: 0	Sample No: Q2800
Lrop: [REDACTED]	Lab No: 45314	Sample Date: 03/03/2015
		Report Date: 03/11/2005

Total Exchange Capacity:	14.93
Colloidal Organic Matter %:	1.81
Soil Type: Potentially an over-saturated soil.	



BASE SATURATION PERCENT	
DESIRED Ca : Mg RATIO FOUND	88 - 12
CALCIUM	93.24
MAGNESIUM	2.40
POTASSIUM	1.98
SODIUM	0.78
OTHER BASES	1.80
EXCHANGEABLE HYDROGEN	0.00
pH of Soil Sample	7.3

CALCIUM	Desired Value	449
kg/ha	Value Found	6093
	Deficit/Surplus	=1597

MAGNESIUM	Desired Value	439
kg/ha	Value Found	94
	Deficit/Surplus	-345

POTASSIUM	Desired Value	380
kg/ha	Value Found	253
	Deficit/Surplus	-127

SODIUM	Value Found	58
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NITROGEN	ENR	
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Sulphate (SO ₄)	Value Found	28
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phosphate (P2O5)	Desired Value	128
kg/ha	Value Found	73
	Deficit/Surplus	-55

MORGAN P	
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TOTAL PHOSPHORUS as ppm:	1190
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TOTAL PHOSPHORUS as P ₂ O ₅ kg/ha	2745
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SULFUR ppm	512
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TOTAL K kg/ha	2310
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TOTAL Ca kg/ha	115114
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TOTAL Mg kg/ha	2596
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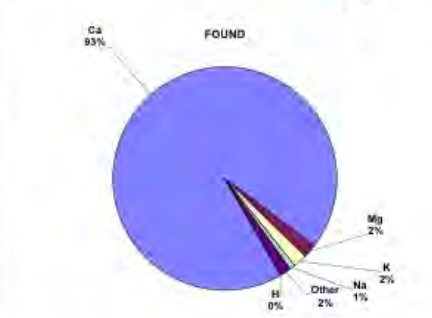
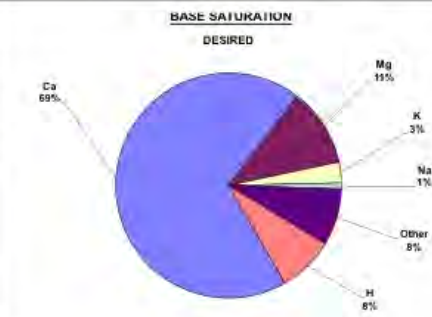
TOTAL Na kg/ha	172
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UK Index	Mg/L	Index
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Phosphate	14	1
Potassium	128	2
Magnesium	39	1
pH	3.1	

Soil Index	Mg/L	Index
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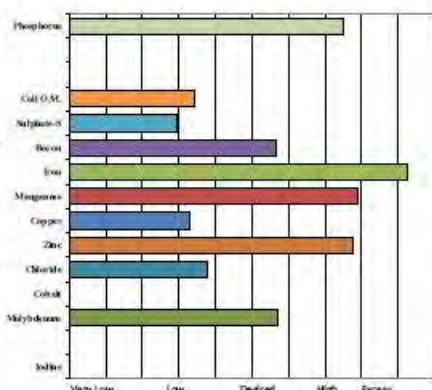
Phosphate (Morgan)	0	
Potassium	0	
Magnesium	0	
Calcium		
Organic Matter	3.1	
Buffer pH	7.4	



Customer: [REDACTED] Farm: NICHESBOROUGH HILL Advisor: Ian Robertson 0165312

FIELD ID: MOW MEADOWS TOP	THA/E: 0	Sample No: Q28000
Lrop: [REDACTED]	Lab No: 46321	Sample Date: 03/03/2015
		Report Date: 03/11/2005

Total Exchange Capacity:	12.91
Colloidal Organic Matter %:	3.50
Soil Type: Dark coloured sands, Sandy Loam	



BASE SATURATION PERCENT	
DESIRED Ca : Mg RATIO FOUND	64 - 12
CALCIUM	86.23
MAGNESIUM	58.09
POTASSIUM	25.32
SODIUM	3.94
OTHER BASES	3.68
EXCHANGEABLE HYDROGEN	4.60
pH of Soil Sample	6.1

CALCIUM	Desired Value	3433
kg/ha	Value Found	3143
	Deficit/Surplus	-290

MAGNESIUM	Desired Value	300
kg/ha	Value Found	784
	Deficit/Surplus	+484

POTASSIUM	Desired Value	340
kg/ha	Value Found	410
	Deficit/Surplus	+70

SODIUM	Value Found	197
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NITROGEN	ENR	
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Sulphate (SO ₄)	Value Found	46
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phosphate (P2O5)	Desired Value	128
kg/ha	Value Found	167
	Deficit/Surplus	+39

MORGAN P	
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TOTAL PHOSPHORUS as ppm:	2012
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TOTAL PHOSPHORUS as P ₂ O ₅ kg/ha	4807
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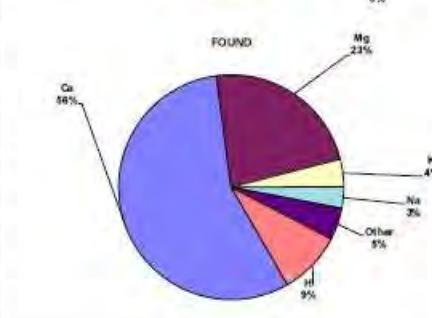
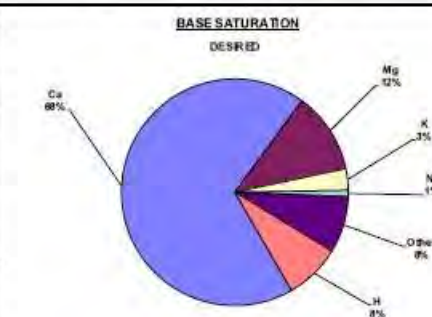
SULFUR ppm	962
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TOTAL K kg/ha	9078
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TOTAL Ca kg/ha	5276
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TOTAL Mg kg/ha	15728
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TOTAL Na kg/ha	302
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UK Index	Mg/L	Index
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Phosphate	36	3
Potassium	195	3
Magnesium	342	5
pH	6	

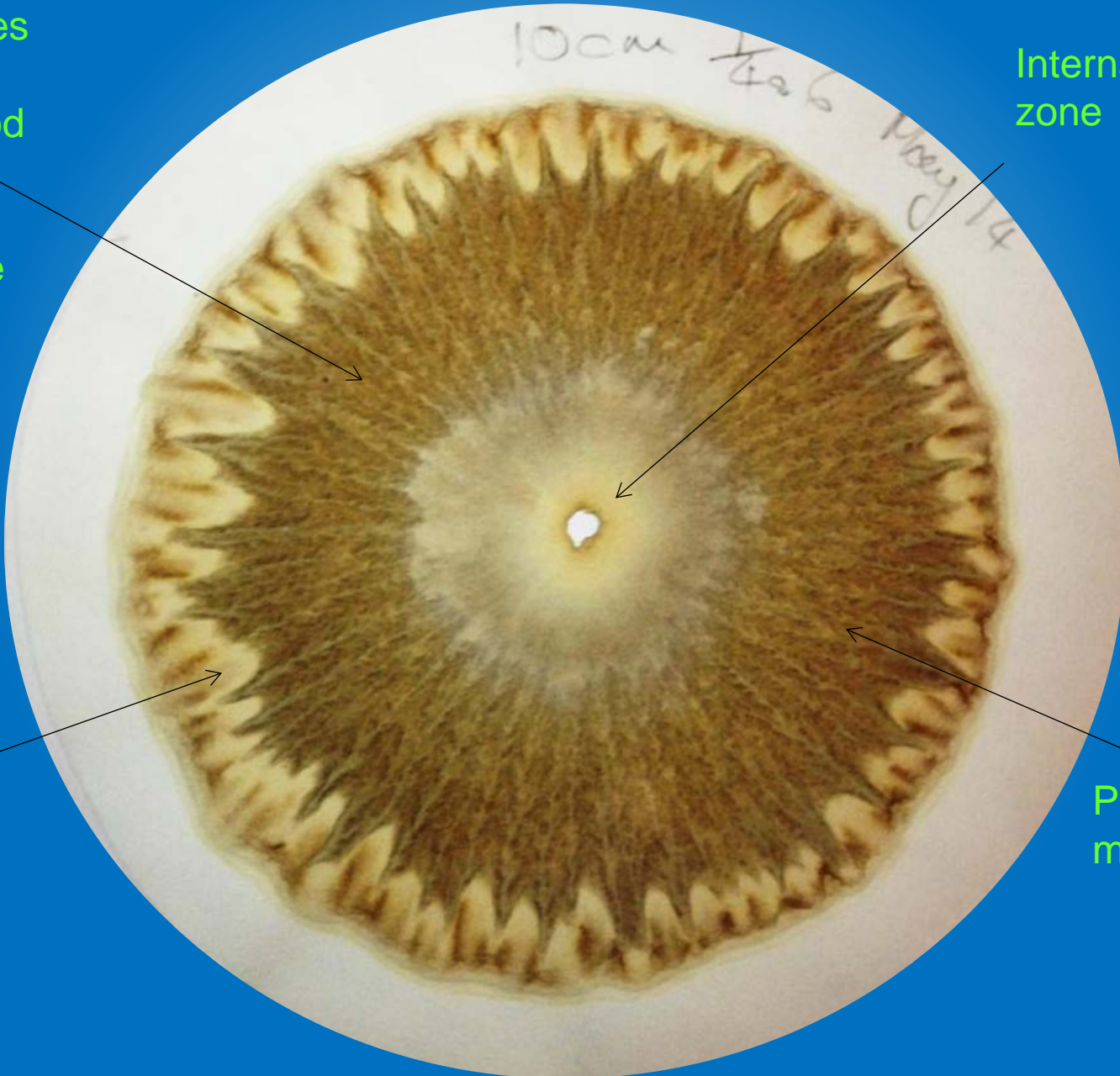
Soil Index	Mg/L	Index
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Phosphate (Morgan)	0	
Potassium	0	
Magnesium	0	
Calcium		
Organic Matter	6	
Buffer pH	6.8	

Soil Chromatography

Irregular lines and rays indicate good biological activity between the zones

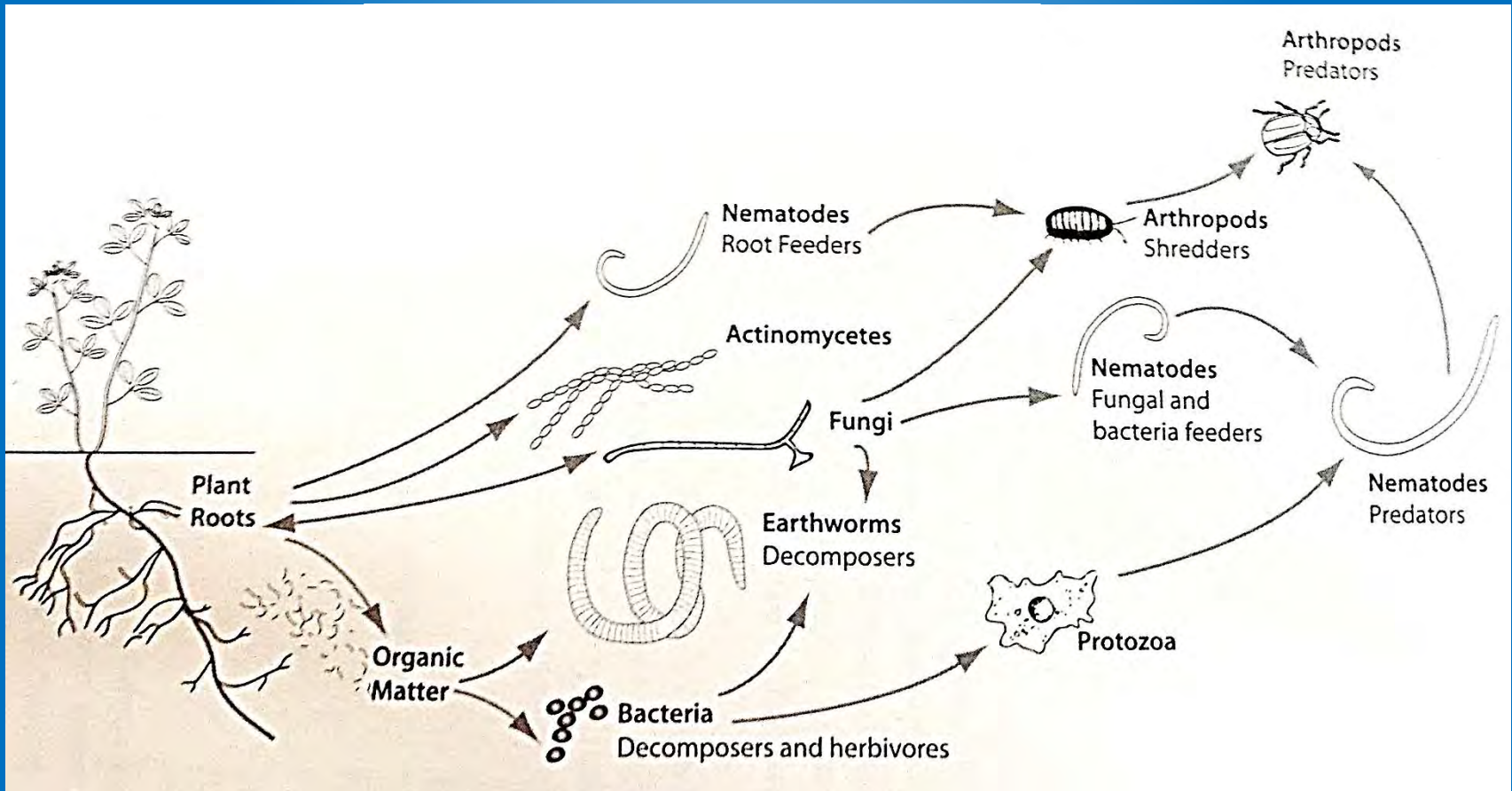
Internal mineral zone



Periferal biology zone

Proteic organic matter zone

Renewables



The Soil Food Web

The Productivity of our soil can never be great than the plant food element which is in least supply for...

Yield & Quality

Tonnes of dry matter per hectare

Mineral dense food

tDM/ha

Brix

Grow top soil

Grazing heights

Chemical

Hoof and tooth

Focus points

Physical

Plant diversity

Liquid feeds

Compost

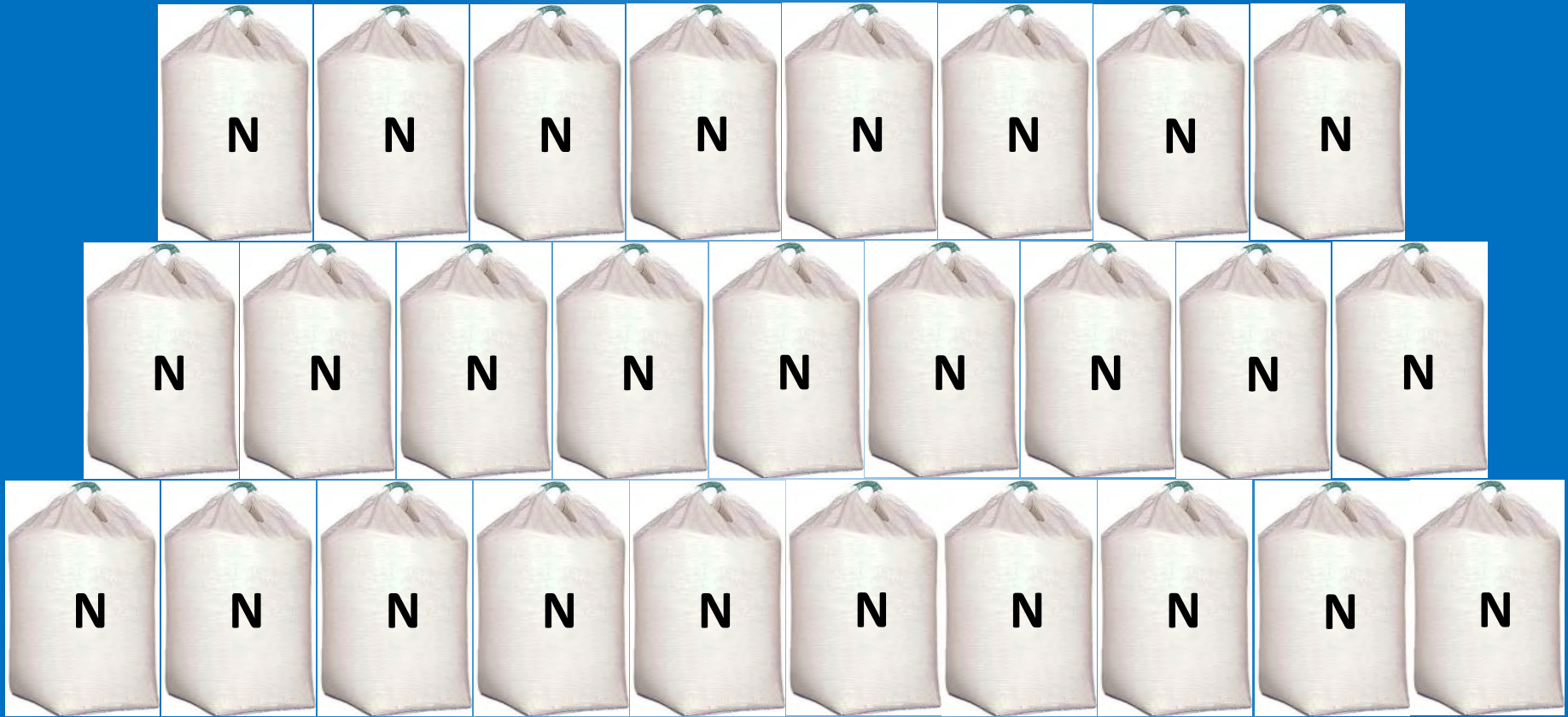
Biological

Growing Top Soil

Soil Penetrometer



Air vital for soil health



74,000 tonnes of N are above every hectare



CO₂



Cover Crops

- Maximising photosynthesis
- Feeding and protecting soil biology



Mob Graving

- Maximising plant exudates
- Building organic matter





Plant Diversity





Compost

- Carbon source
- Chelating minerals
- A live fertilizer
- 10x more effective than FYM



Foliar feeds

- Carbon source
- Mineral suspensions
- Energy sources
- Competitive exclusion with good biology
- Urea is an amine



Keythorpe Farms fertiliser programme 2015



- Molasses
- Liquid sea weed or fish
- Epsom salts
- Sulphur
- Boron
- Humates??

The Quality and Integrity of the feed we produce on farm is a result of the way we manage Our Soils.



Conclusions

- The management of our soils has a direct impact on the **Integrity** of the food we produce.
- **Soil biology** and **Plant Diversity** will build **Resilience** and **Efficiency** in our farming systems and increase the **Nutrient Density** of the food we produce.
- Farmers have a massive opportunity to **Multiply Soil Biology** using compost and foliar feeds.
- Plants grown in high biological soils are **Less Prone** to **Disease** and **Pest** attack.
- Excessive use of soluble fertilizers and chemicals will **Shut Down** biological functions reducing the nutrient density of the food produced
- 1st generation GM technology is **Mummifying** soil biology, burning off organic matter and producing **Empty Calories** that can not feed the world.

Biological Farming is the Future



Recommendations

- Know your **Base saturation** levels in your soils and adopt an appropriate fertiliser policy.
- Feed and nurture **Soil Biology** as a priority.
- Use **Plant and Soil Microbe Diversity** to improved feed quality and build **Resilience** in our soils and farming systems.
- Maximise on farm manures to make **Live Mineral Rich Fertilizers**.
- Collaborate with **Arable Farmers** to secure our future.
- **Question** the integrity of any bought in feeds.
- **Influence** the **Decision** on the 1st generation of GM technology being grown in the UK

**Biological Farming Can Out Perform Chemical Agriculture
And Produce Higher Integrity Feed.**

