Low Input Dairying Challenges and Opportunities

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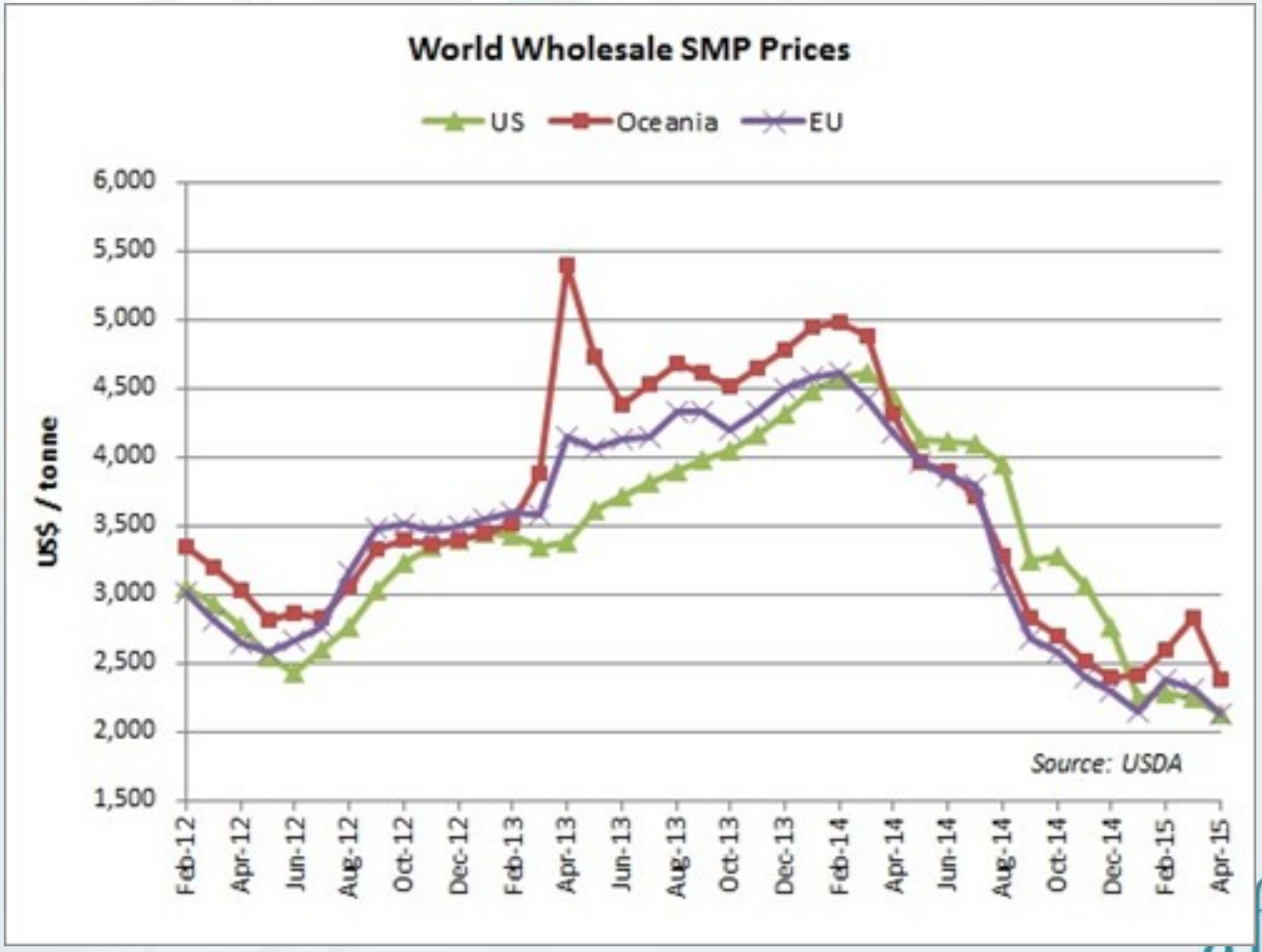
Overview

- Why Low Input?
- Role of Grass and Forage
  - Growing grass
  - Effective grassland management
  - Efficient conversion of grass to milk
- The Way Forward?

Global Dairy Markets in Decline



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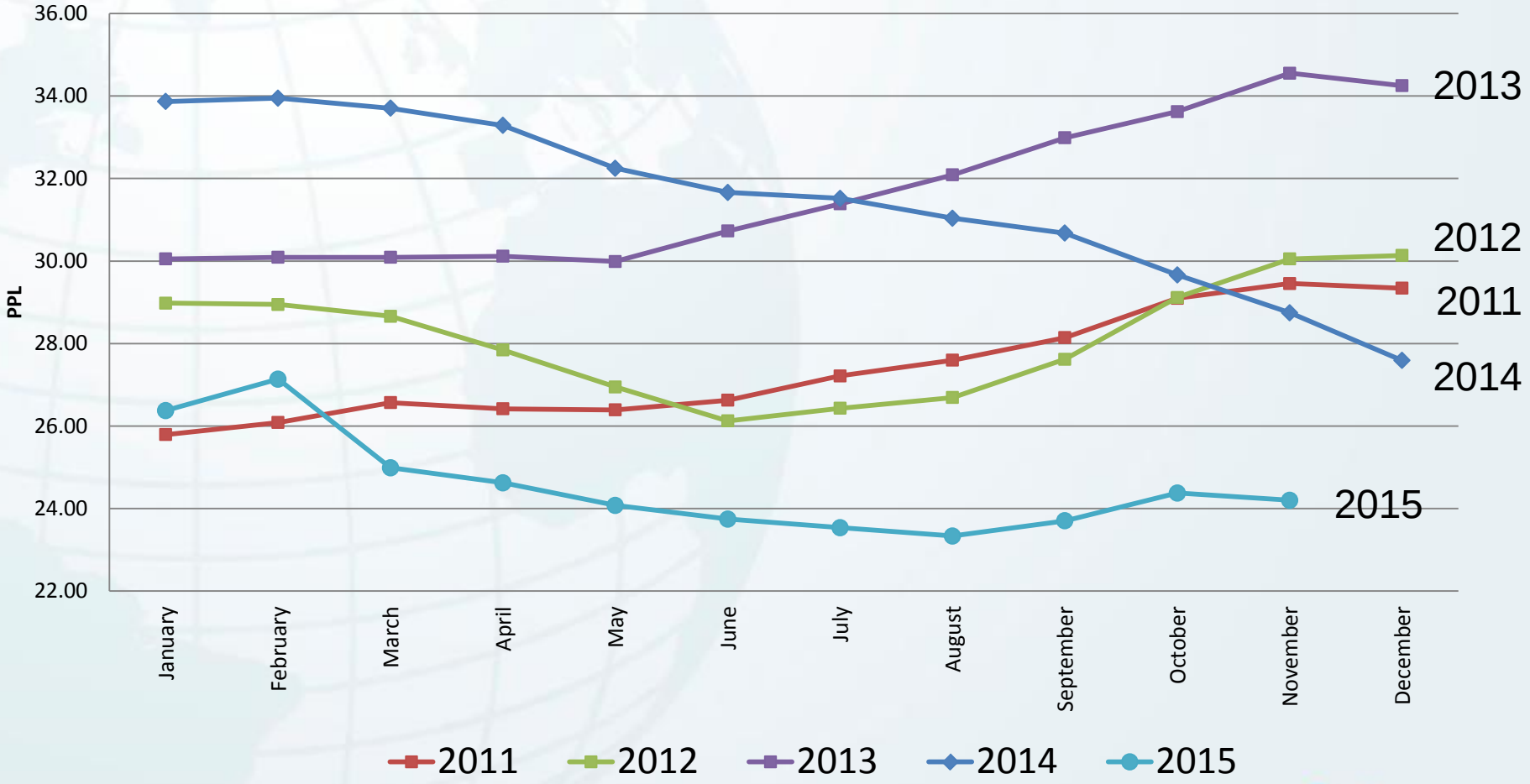
UK Milk Price 2011-2015



Source: AHDB Dairy

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Costs of Milk Production 2015 (ppl)

	Top 25%	Bottom 25%
Total Variable costs	12.3	13.8
Replacement cost	2.1	3.4
Cash only fixed costs	9.1	12.5
Total cash costs	23.5	29.7
Other fixed costs	12. 1	18.2
Total FEC	**26.5**	**35.5**

Source: AHDB Dairy

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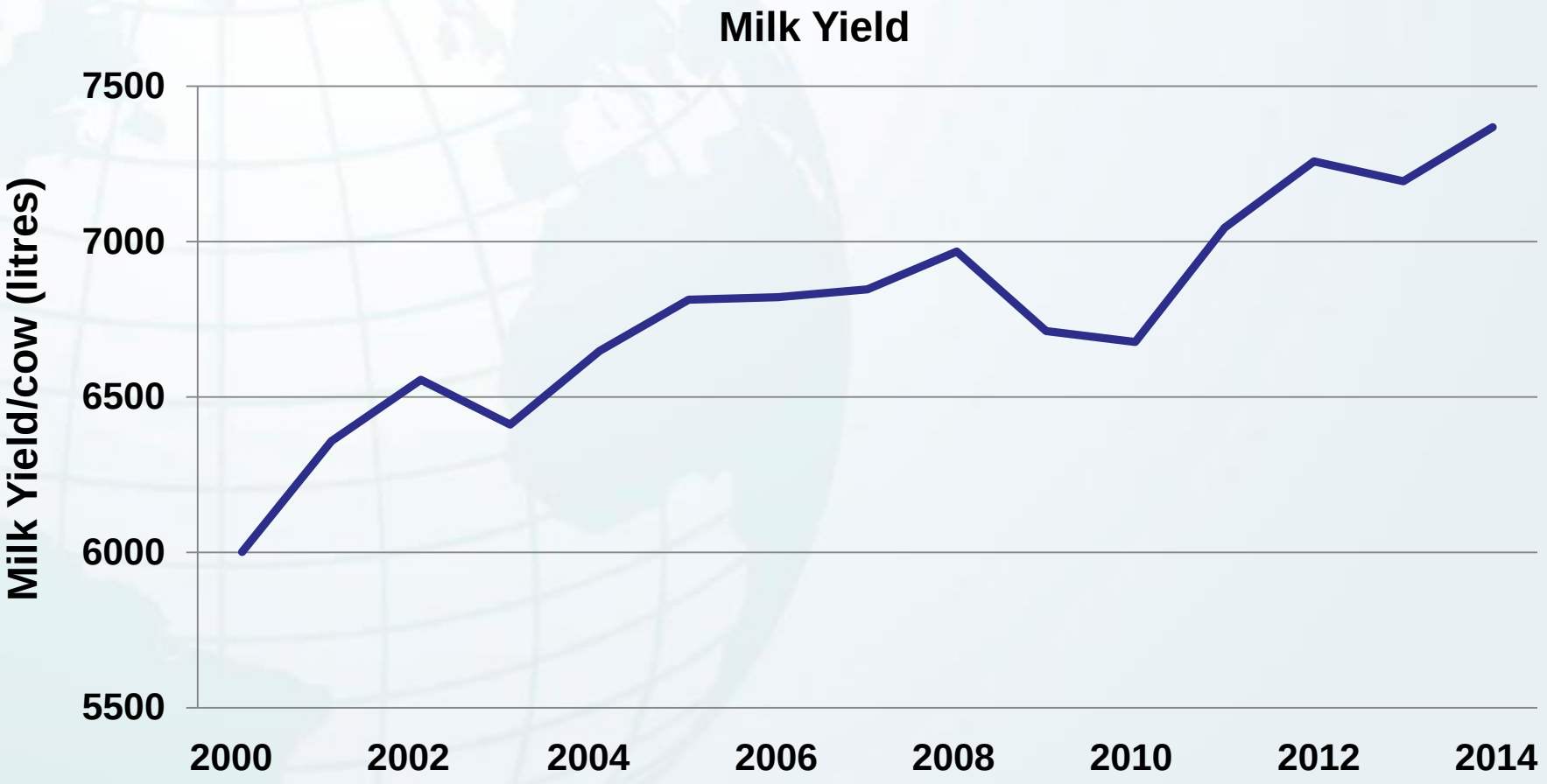
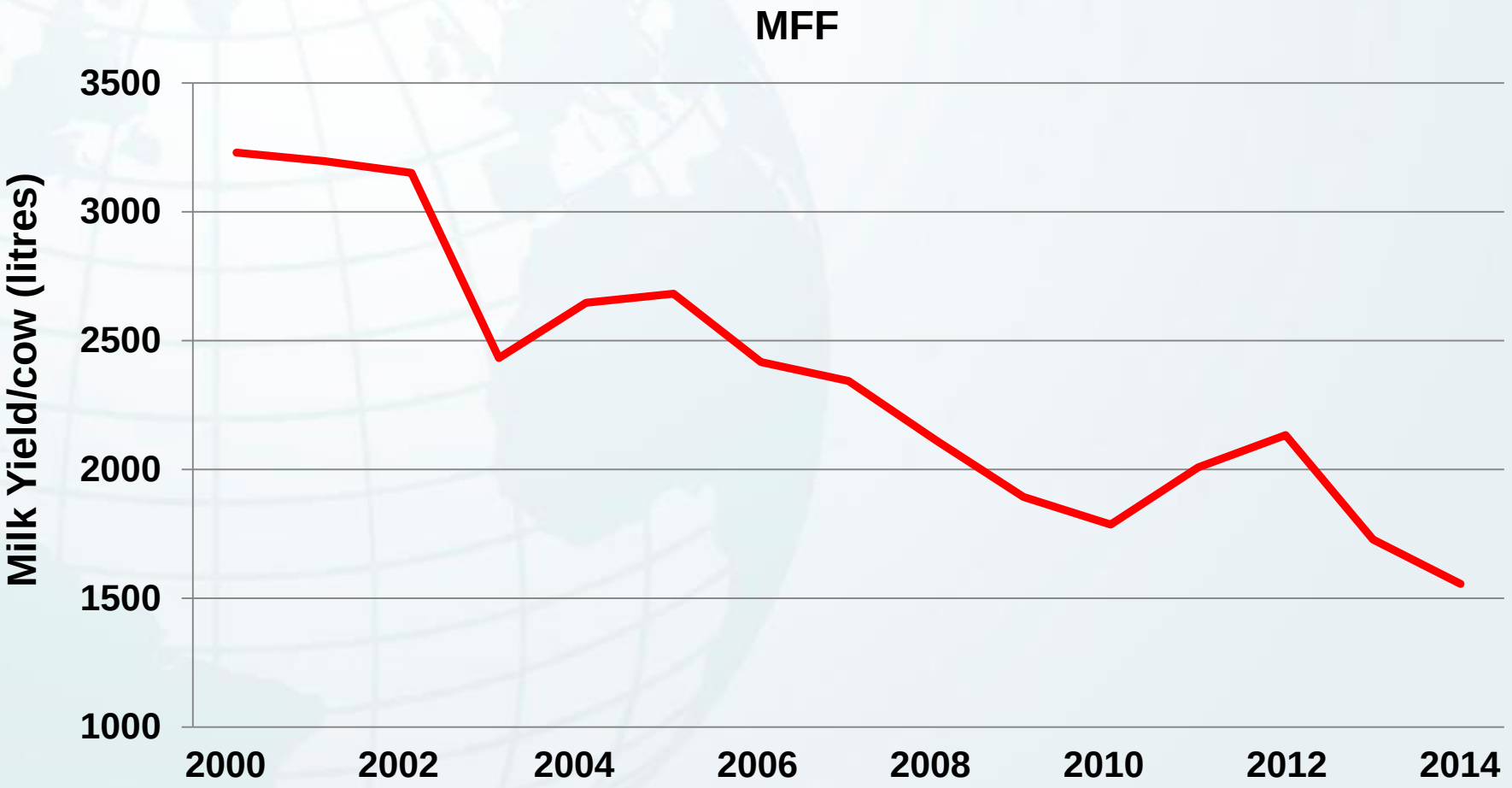
Trends in Milk Yield Per Cow



CAFRE Benchmarking Data

Production From Forage Per Cow



CAFRE Benchmarking Data

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Why is Reduced Production From Forage a Concern?

West of UK - competitive advantage is grass.

- Potential Yields of up to 14 tDM/ha
- Long/reliable growing season

Increase in demand for concentrate feed ingredients:

- Increasing global food demand
- Volatile global market
- Transport costs
- Global shortage of protein feeds

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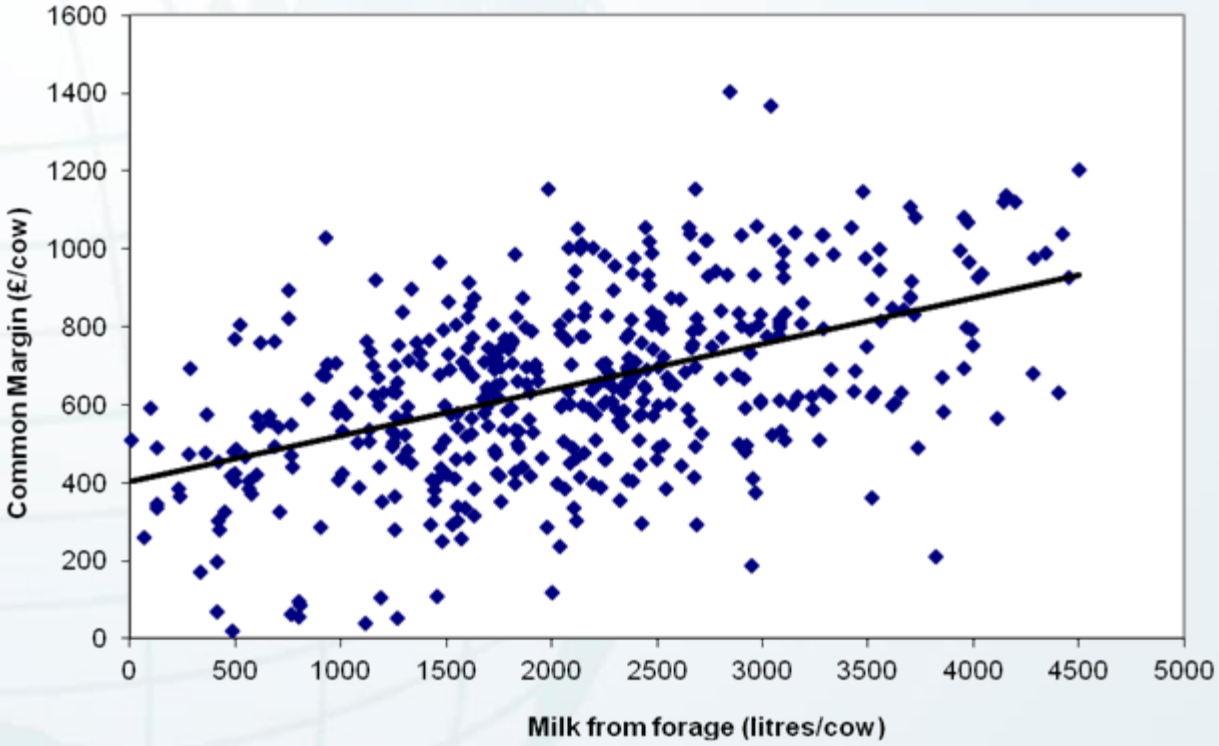
Relationship Between Milk From Forage and Common Margin Per Cow from CAFRE Benchmarking



Each 1000 litre increase in milk from forage is worth £120 per cow in increased profit.

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Production From Forage - Research

Milk from all forage

1. **4680 litres** - Rae et al. (1986), England. 3-year study, all-grass diet, winter calving.
2. **5500 litres** - Lincoln University, New Zealand, 2011/12. All-grass diet, spring calving, rotational grazing, irrigation.
3. **5841 litres** – (Ferris et al, 2013 Northern Ireland).

   3-year study, high genetic merit cows, autumn calving, high quality silage +6 kg concs, early turnout, rotational grazing, no concs. Total yield: 8230 litres. Milk from forage = **70%** of total.

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Grass Production

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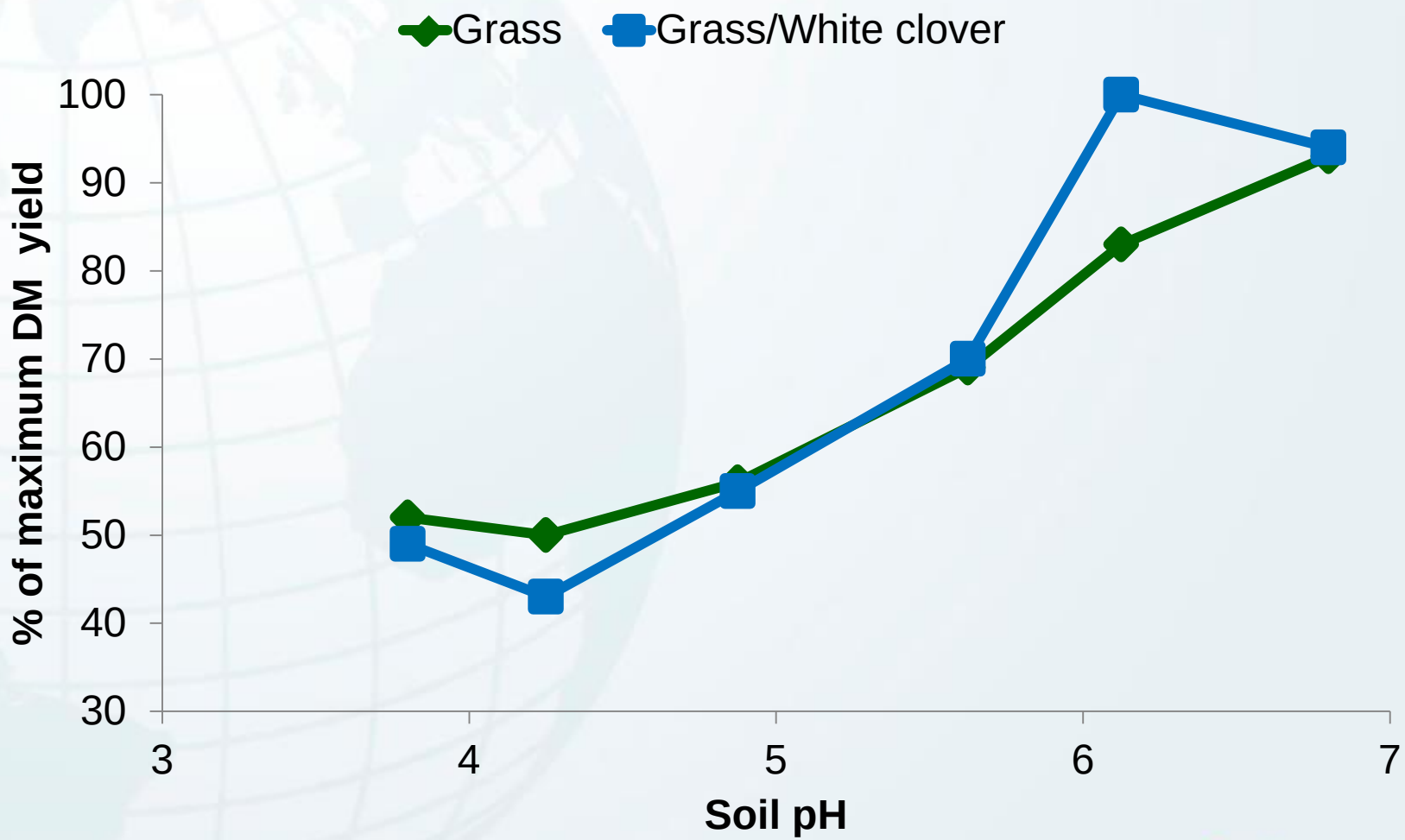
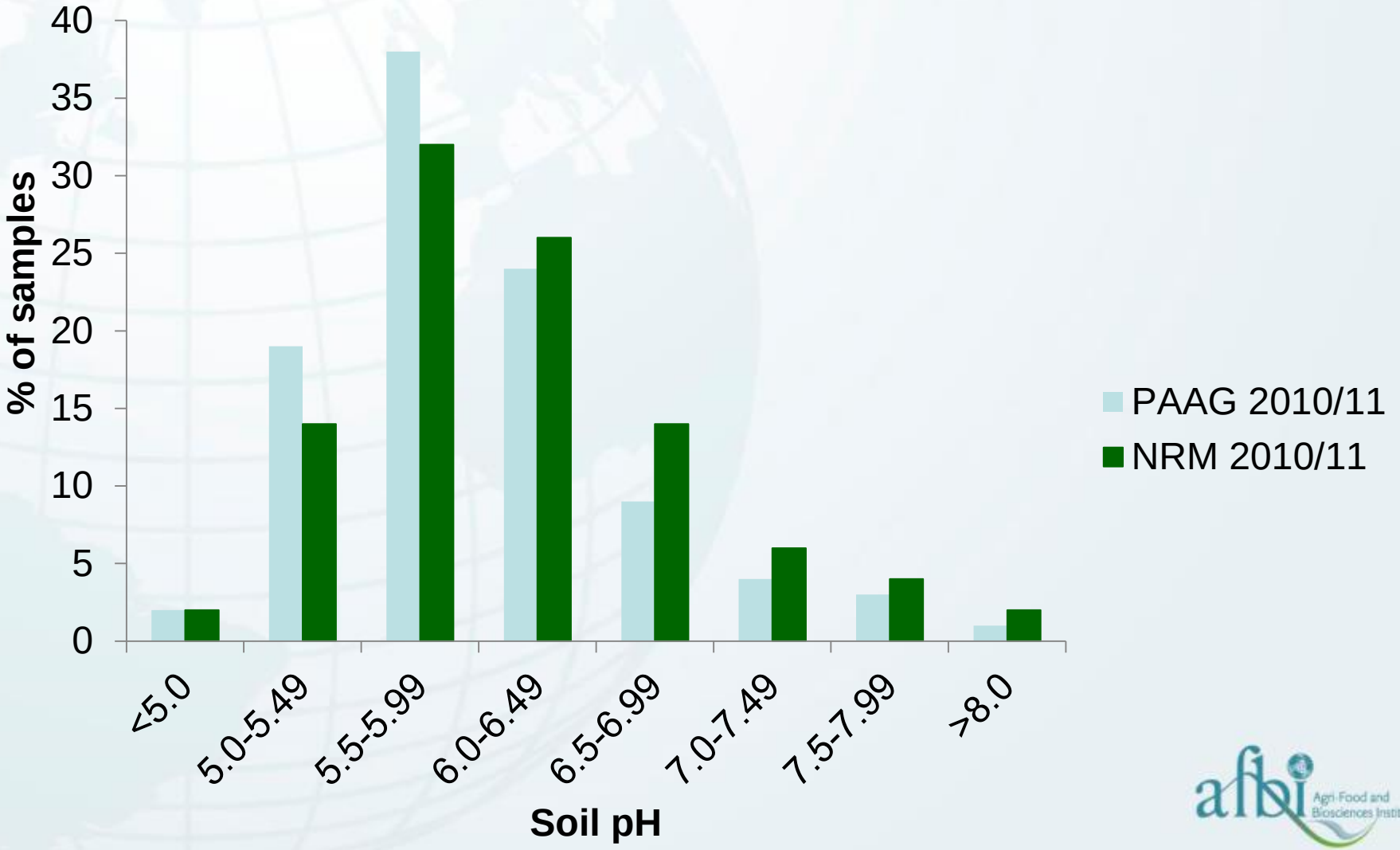
Soil pH and Grass/Clover Growth



From Hopkins *et al.* (1990) Grass and Forage Science

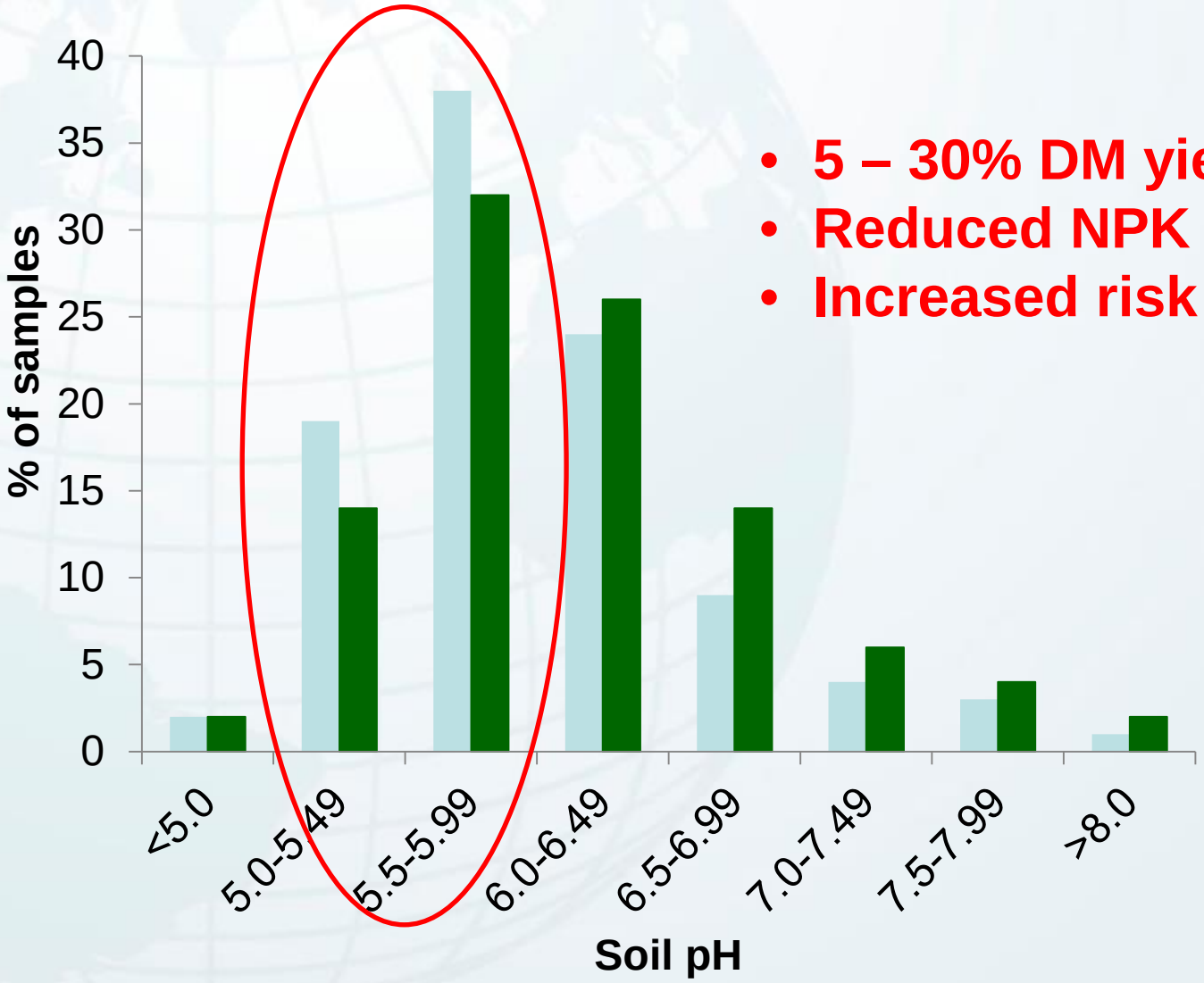
Soil pH – UK Grassland Soils

Source: Fisher, 2013



Soil pH – UK Grassland Soils

Source: Fisher, 2013



- **5 – 30% DM yield loss?**
- **Reduced NPK efficiency?**
- **Increased risk of N/P loss?**

Phosphate and Potash Status – no better!

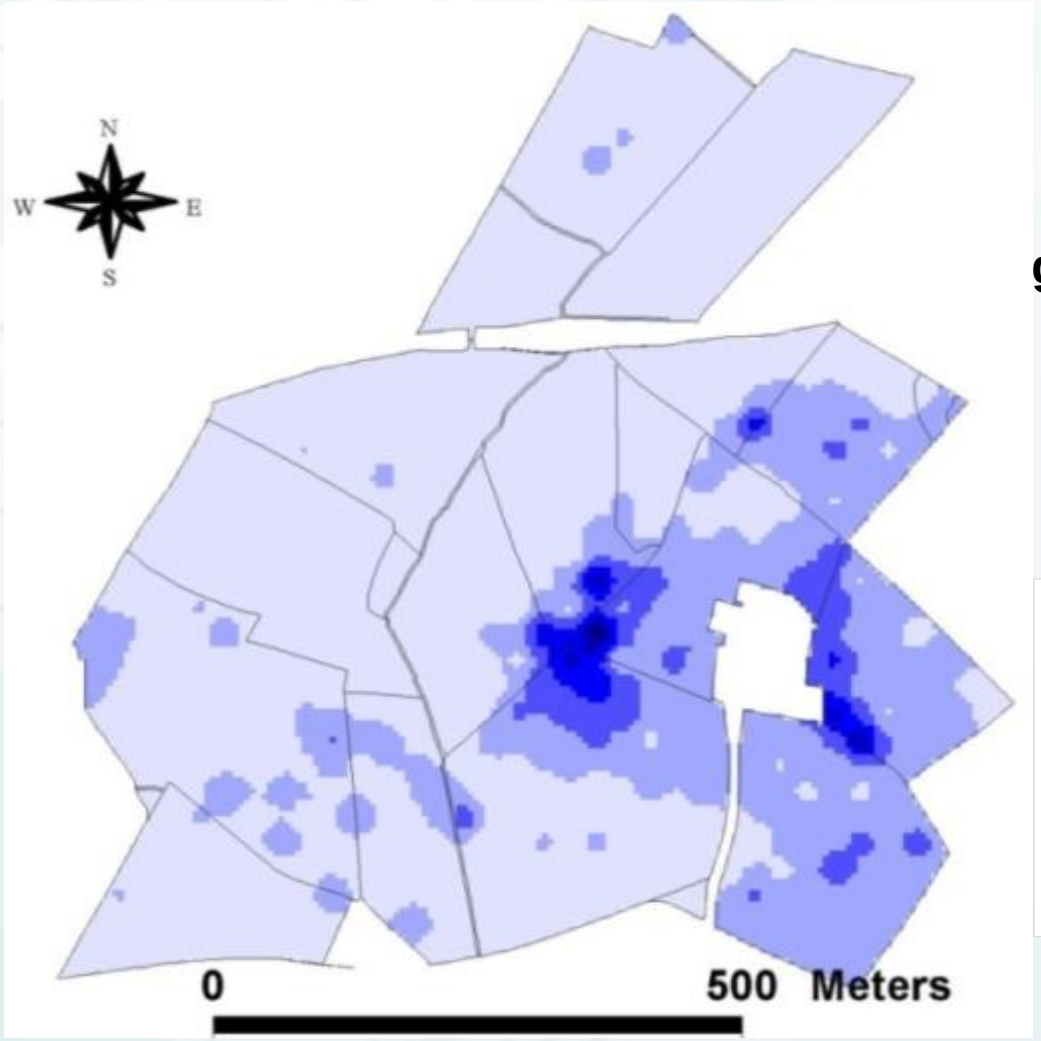
Source: Fisher, 2013

Percentage of grass samples in P and K indices

	P INDEX		
K INDEX	*< target*	*target*	*> target*
< target	**20**	**12**	**10**
target	**10**	**8**	**8**
> target	**7**	**9**	**15**

(PAAG, 2012 – 38,266 samples)

Soil P Distribution on a Grassland Farm



Soil P distribution across 50 ha grassland farm (Bailey et al, 2013)

Soil P Index

1 & 2	Low - OK
3-	High
3+	High
4	Very High
5-	Gross Excess
5+	Gross Excess

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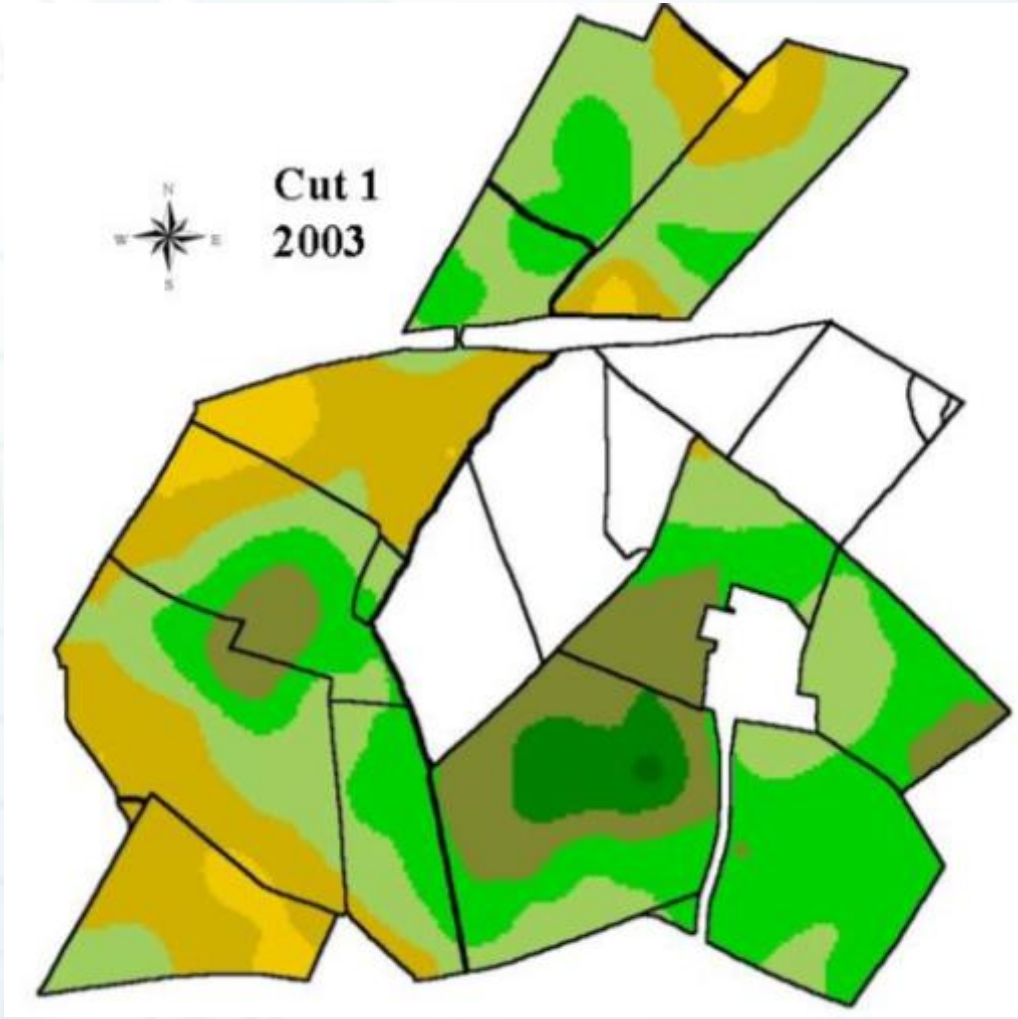
Variation in Grass Production



Source: Bailey, 2015

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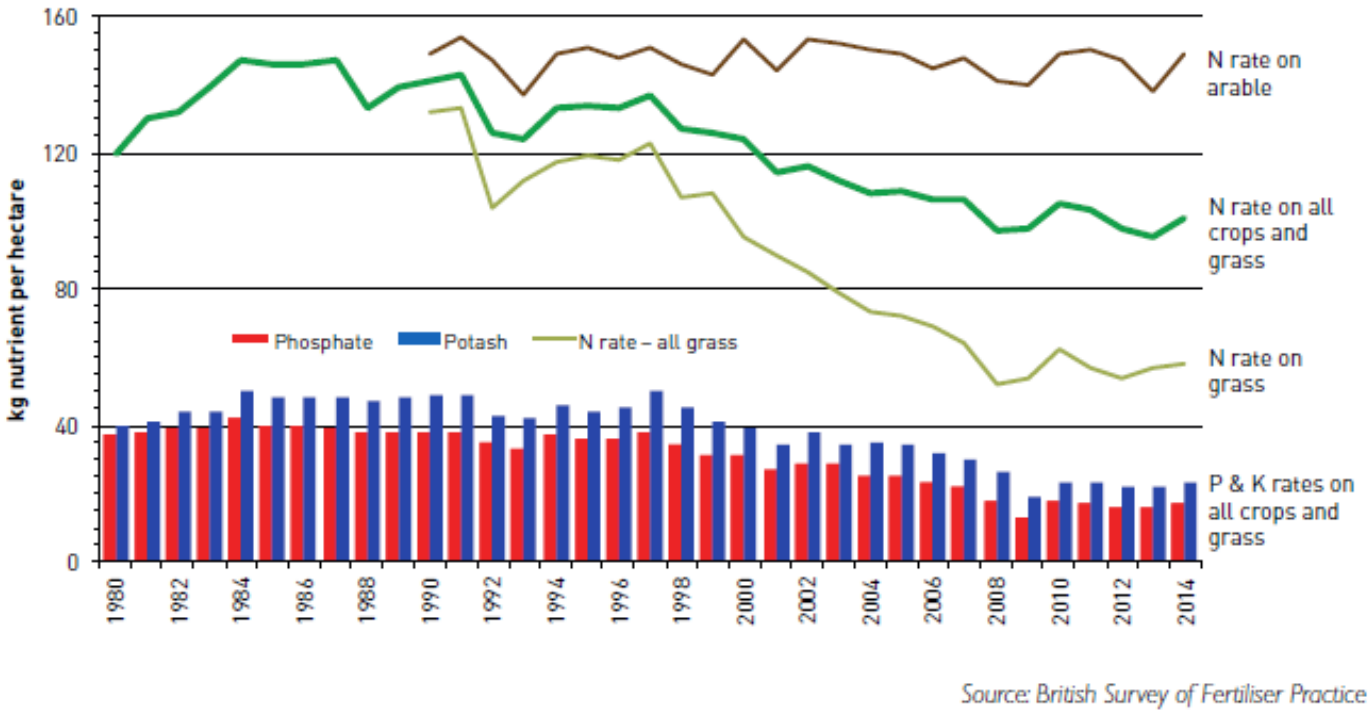
Nitrogen Fertiliser Levels for Grassland

Figure 1
Changes in overall fertiliser nutrient application rates, England and Wales



N level on grassland now 60 kg N/ha compared to 130kg N/ha in 1990

Source: AIC Fertiliser Statistics 2015

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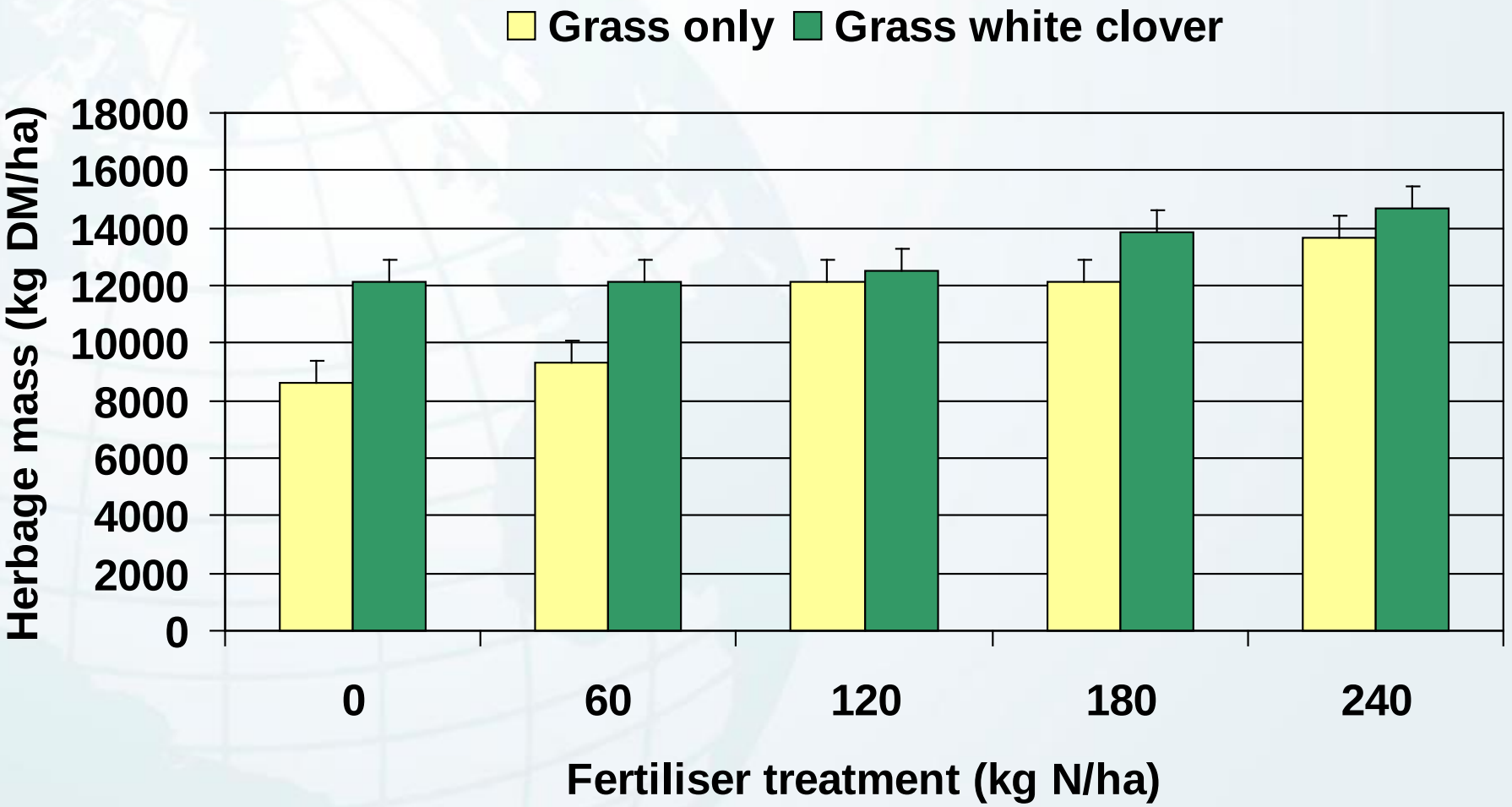
Three Years Herbage Production (2010-12)



Source: Teagasc: *(Enríquez-Hidalgo* et al., 2013**)**

Efficient Grassland Management

At Paddock Level

Producing grass that is easy to graze

- Recommendations based on age of regrowth (15- 35 days) or pregrazing height (PreGH)
- To maximize intake **per cow** and **per ha**, PostGH needs to be around 45% of PreGH
- Target:

  Enter paddock between 10 to 14 cm PreGH
  Exit paddock at 4 to 5 cm PostGH

Source: Delaby et al, 2013

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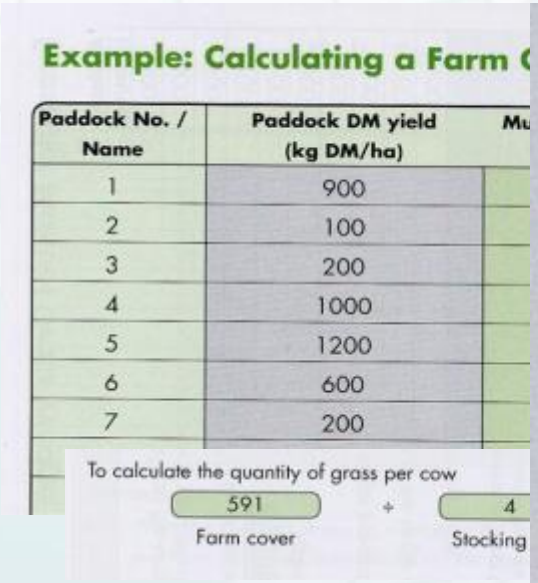
Keep Grass Covers Low

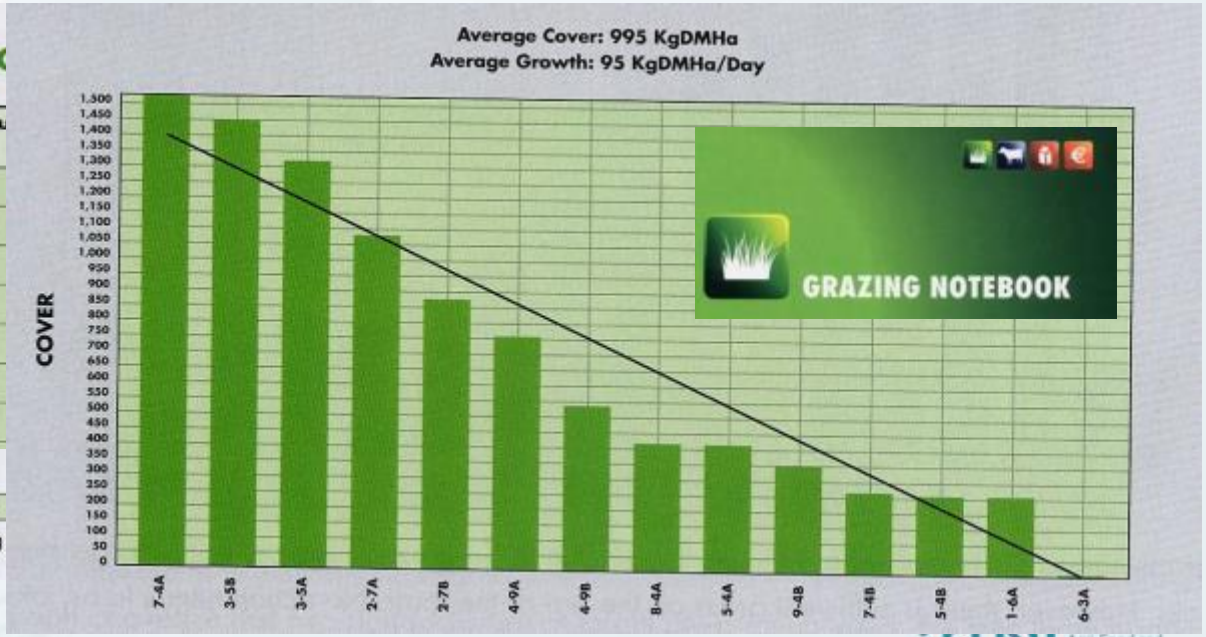
At System Level

Managing the grass budget

- Major developments in grass budgeting methods and tools:

  Grass Wedge (NZ, Ireland,…) and Herb'aVenir (France)






Efficient Conversion to Milk

Production From Forage – Cow Genetics

Selection of animals for grass-based systems is essential for profitable pasture-based systems

Key Characteristics:

- Propensity for high grass DM intake
- Efficient conversion of grass to milk solids
- High fertility and longevity
- Easy care and docile
- Robust to fluctuations in grass quality an quantity

Crossbreeding?

- Why crossbreeding? Introduction of desirable traits from another breed

	Holstein	*Jersey crossbred*
Milk Yield (litres/cow/lactation)	**6070**	**5463**
Fat (%)	**4.20**	**4.78**
Protein (%)	**3.30**	**3.59**
Fat + Protein yield (kg/cow/lactation)	**467**	**471**
Average live weight (kg)	**510**	**470**

- Crossbred cows grazed for an extra 50 minutes each day - well suited to grass based systems
- Functional traits:
  - Reduced incidence of still births, mastitis and lameness
  - Improved fertility,
  - Increased longevity (4.8 vs 3.6 lactations)
  - Increased profitability (£27/cow/year)

Source: Ferris et al, 2015

Summary

The basics of profitable livestock production from grass remain the same:

- Growing high yields of quality grass:
  - managing soil and swards
  - soil ph and fertility
  - N fertiliser or grass/cover or mixed swards

- Using grass efficiently for grazing and silage:
  - lower grass covers pre and post grazing
  - the right cow for the system
  - flexibility to cope with adverse weather

- Major Research/Advisory/Industry initiative needed to drive :

Focus on Forage

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