

Grass Based Milk Production Systems

Wednesday 28th of August 2013

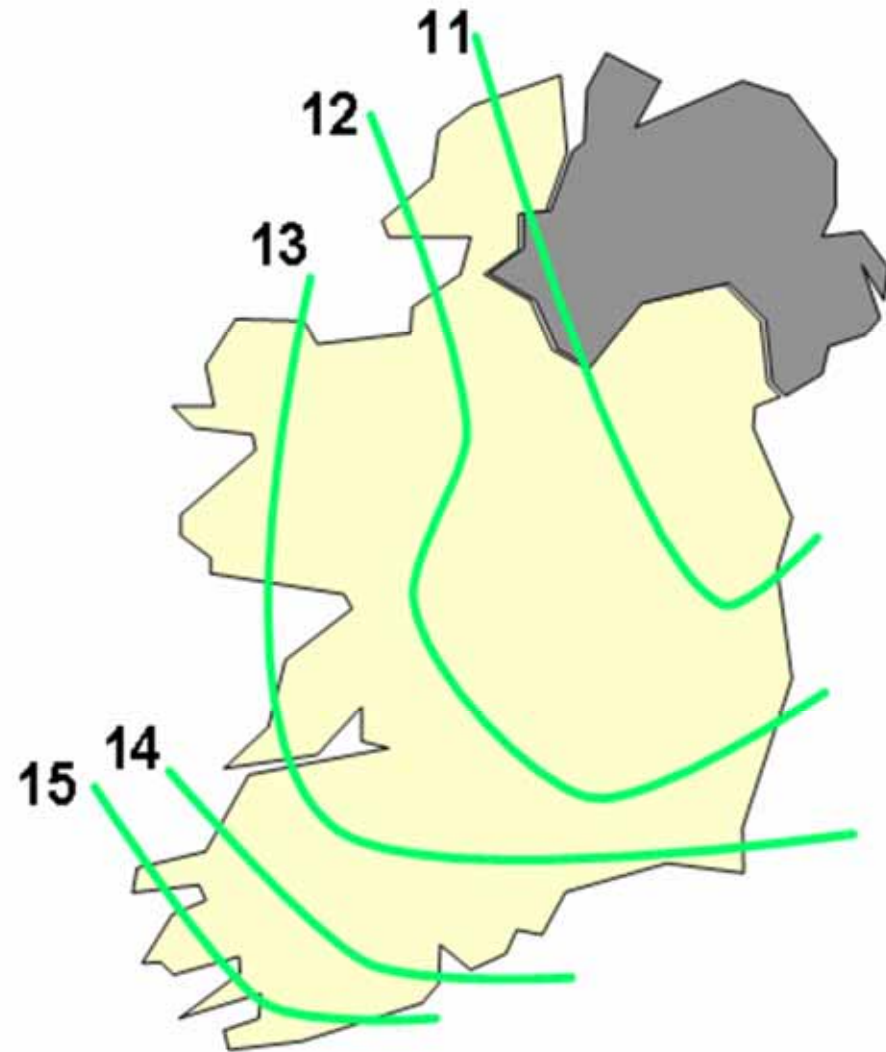
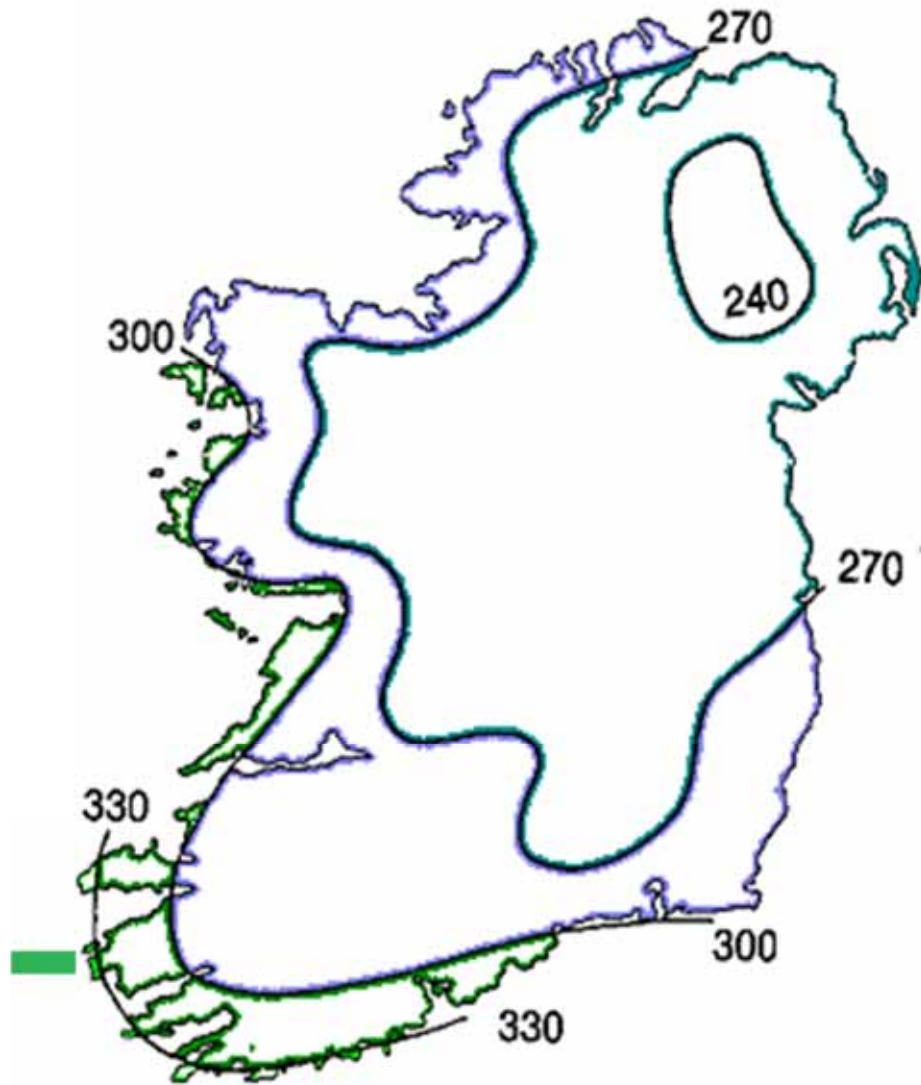
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Irish Dairy Sector-Shape and Size

- There were 18,300 dairy farmers in 2010-34% of Agriculture Output
- Dairy cow numbers are 1.127 million- average herd size- 62-cows producing 283,601 litres per farm; SR 1.9 cows/ha
- National milk supply in 2010 5.3 million litres- 5,105 litres/cow 3.85% fat and 3.37% protein
- Highly seasonal- in 2010 118 million litres in December/ 696 million litres in May
- Milk utilisation in 2009 56% Butter; 31% cheese; 4% WMP; 8% Others;
- 85% of milk produced exported as dairy products
- 2010:Gross Output 30.9c/l; Total Costs 23.4c/l; Net Margin 7.5c/l

Long grass-growing season (days) and high annual herbage production (t DM ha⁻¹) (Brereton, 1995)



Food Harvest 2020

Vision for agri-food sector

for next decade

Ambitious growth targets

milk volume: + 50%

beef value: + 20%

pigmeat value: + 50%



SMART – GREEN – GROWTH

Sustainability very important

Consumer and consumer needs are central

<http://www.agriculture.gov.ie/agri-foodindustry/foodharvest2020/>

Overview of Presentation

1. Why Grass-based systems ?
2. Key Components of a sustainable and profitable grass-based systems
3. Adoption of key principals of grazing management
4. Applying best grazing management practices
5. Opportunities for the future...

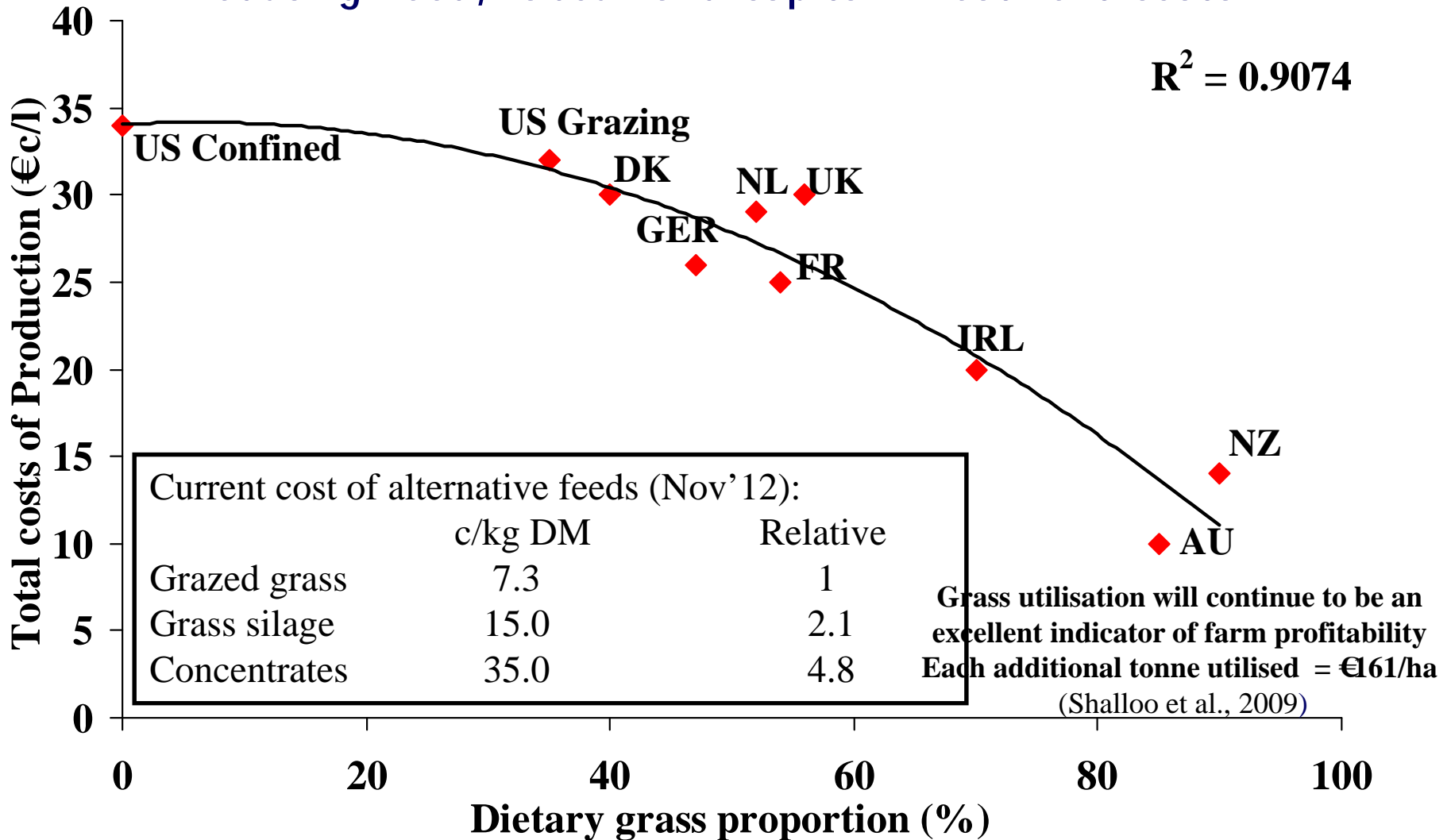
1. Why grass-based systems ?

- Lower cost per unit of milk production
- Superior in milk composition
- Grass based systems have greater sustainability:
 - Economic- family farming business
 - Social- both internal and external
 - Ecological- climate, water, soil, fauna & flora



Feed Costs

Increased grazed grass proportion in the animal diet increases farm profitability by reducing feed, labour and capital investment costs

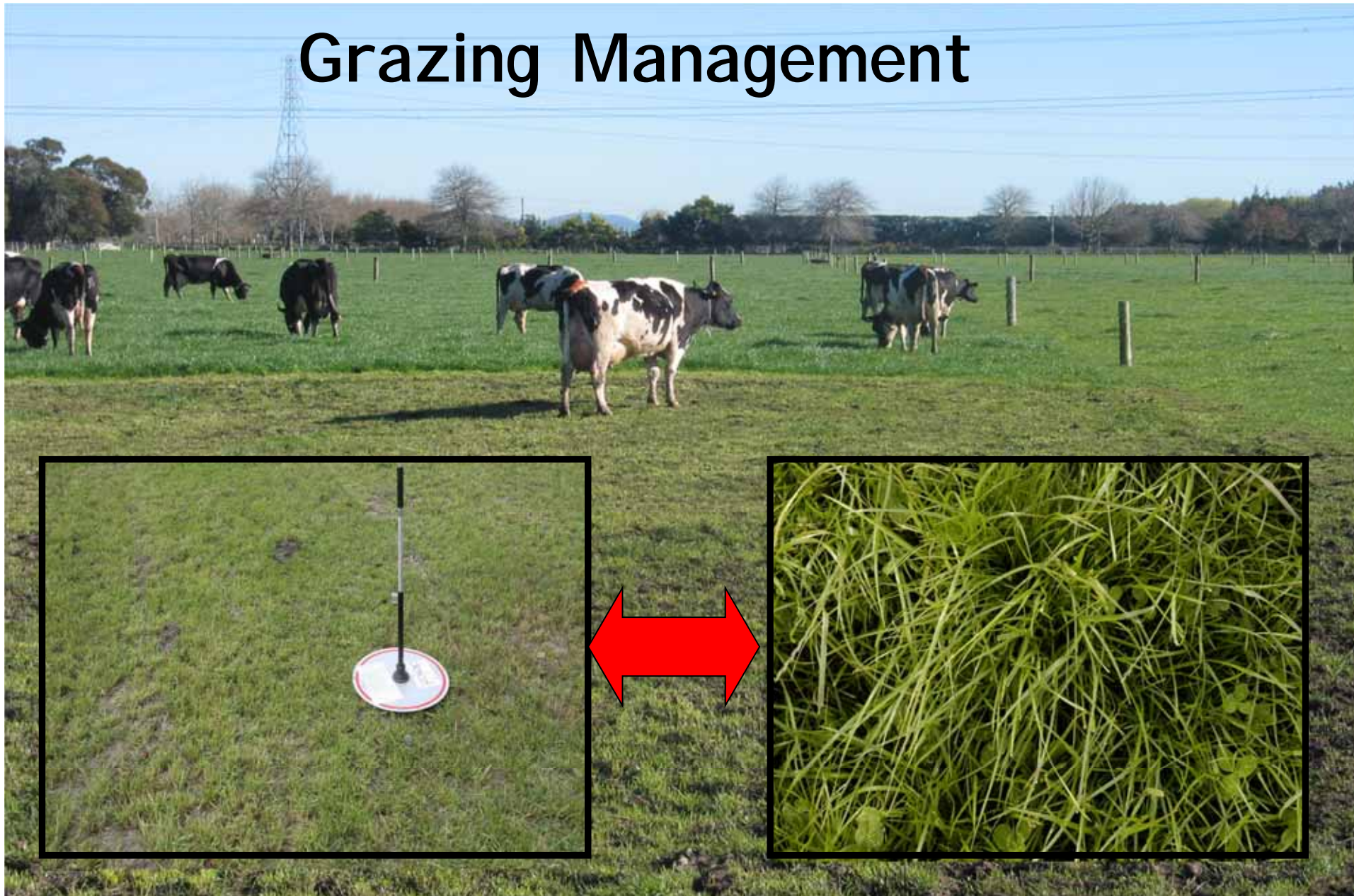


2. Key components of a profitable and sustainable grass based system

- High grass production & utilisation
- High milk productivity per hectare
- High nutrient use efficiency
- Key components
 - Grazing management
 - Genetics for the system



Grazing Management

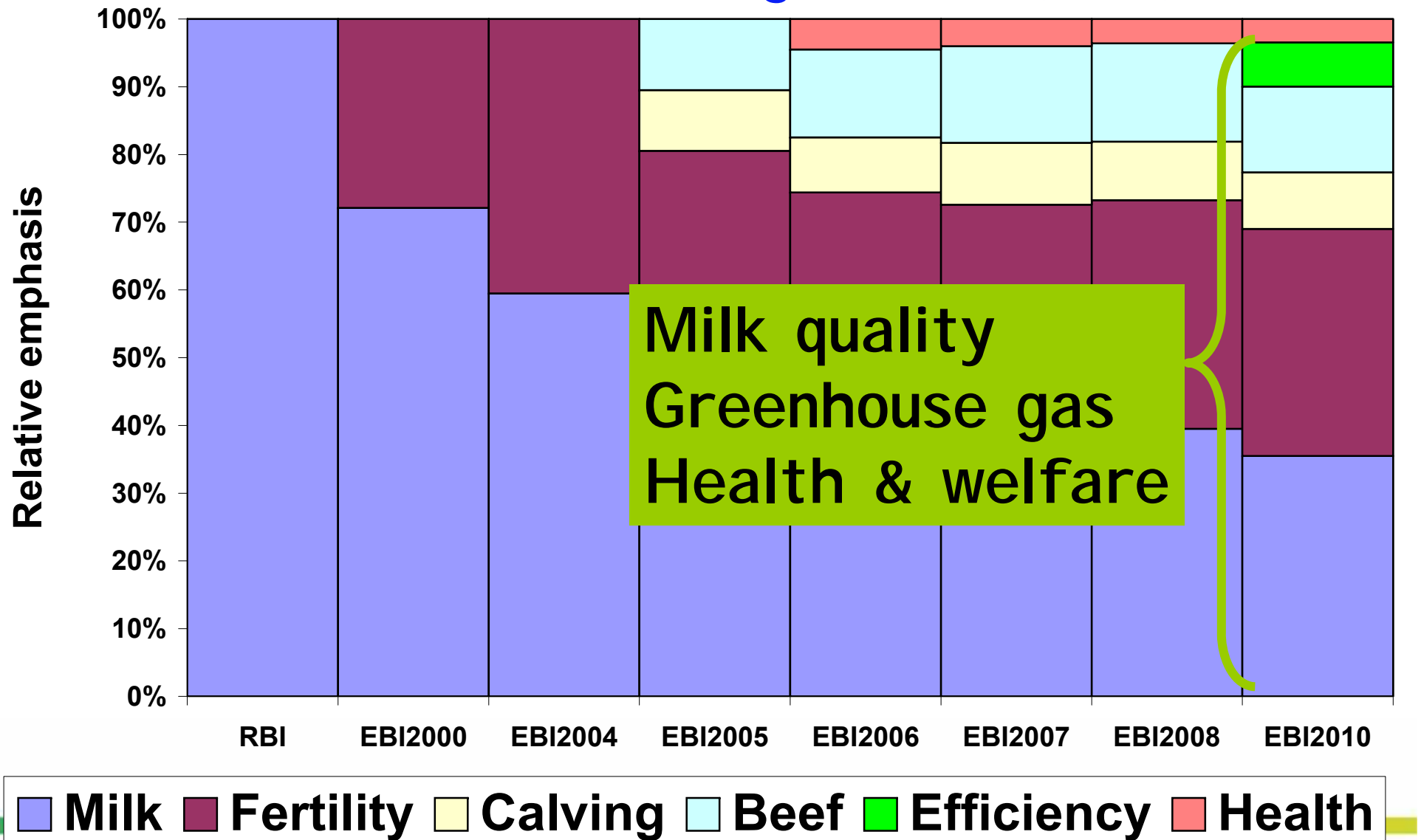


Animal Genotype

Grass-based Genetics is a Requirement of Profitable Pasture-based System: Characteristics

1. Propensity for high grass DM intake- %BW
2. High output per unit area: High Stocking Rate
3. High fertility and longevity
4. Easy care and docile
5. Finished off (predominantly) grass
6. Robust to fluctuations in grass quality and quantity

Economic Breeding Index (EBI)

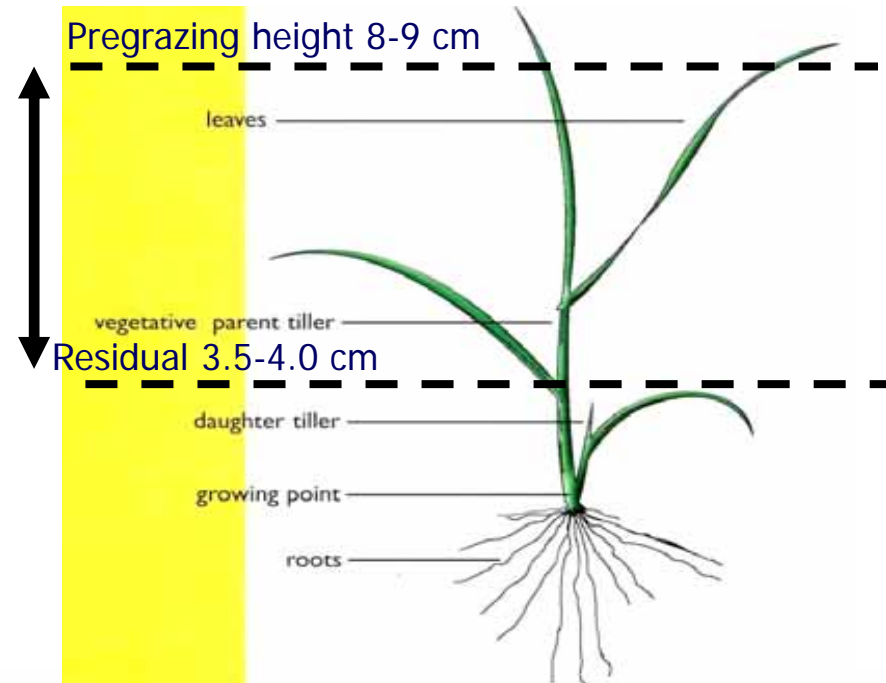
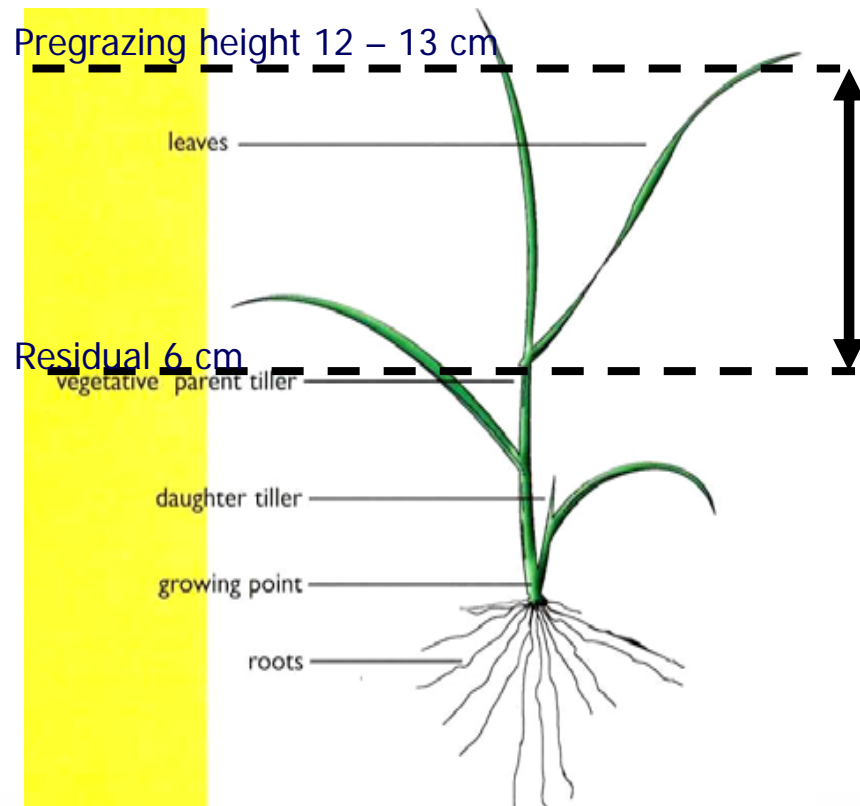


3. Adoption of Key Grazing Management Principals

Avoid leaf death-Create Green Leafy Base

2001 - 2005

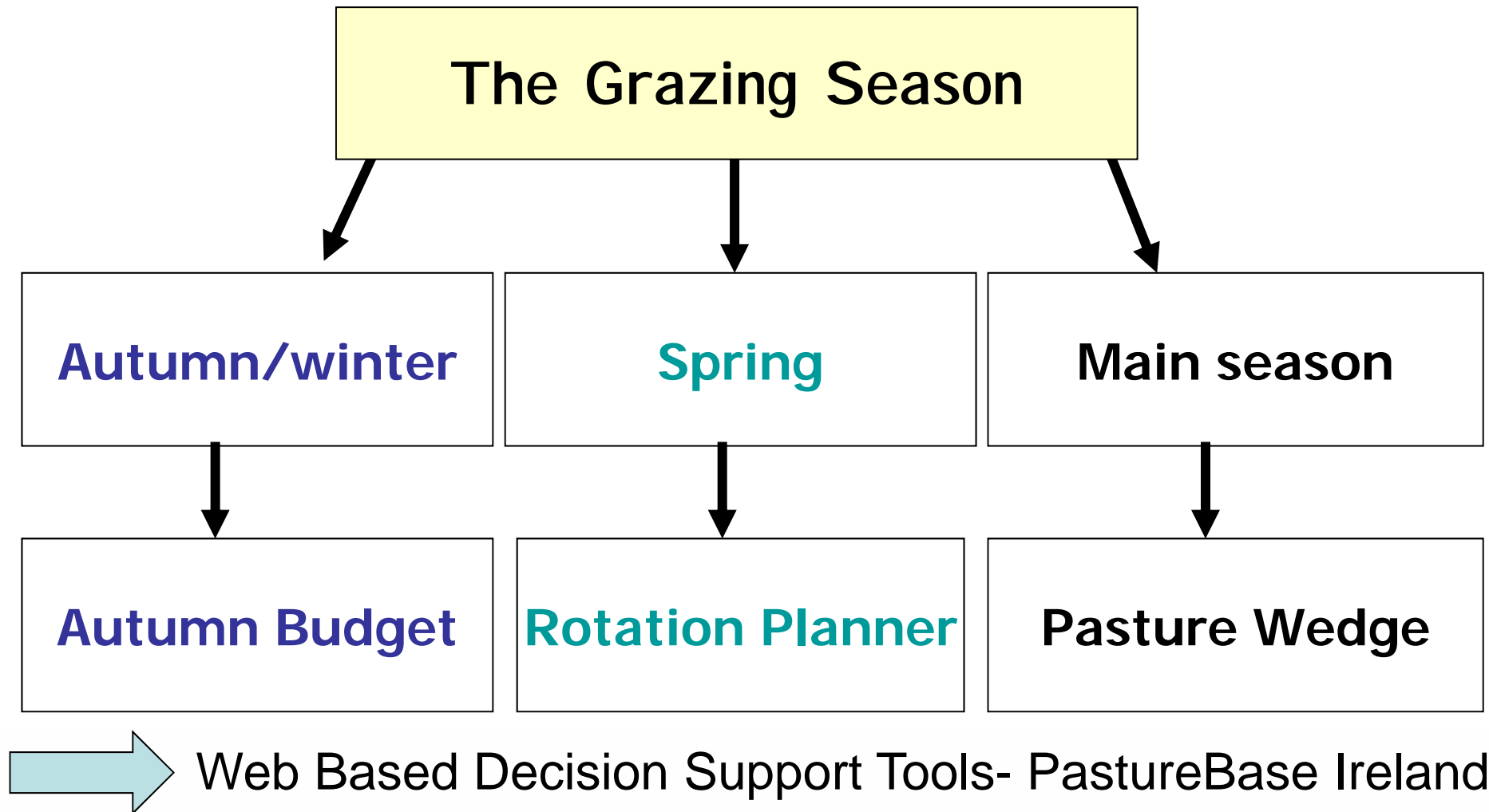
Current



Growth 14.5 tons /ha

Growth 15.5 tons /ha

4. Applying best grazing management practices



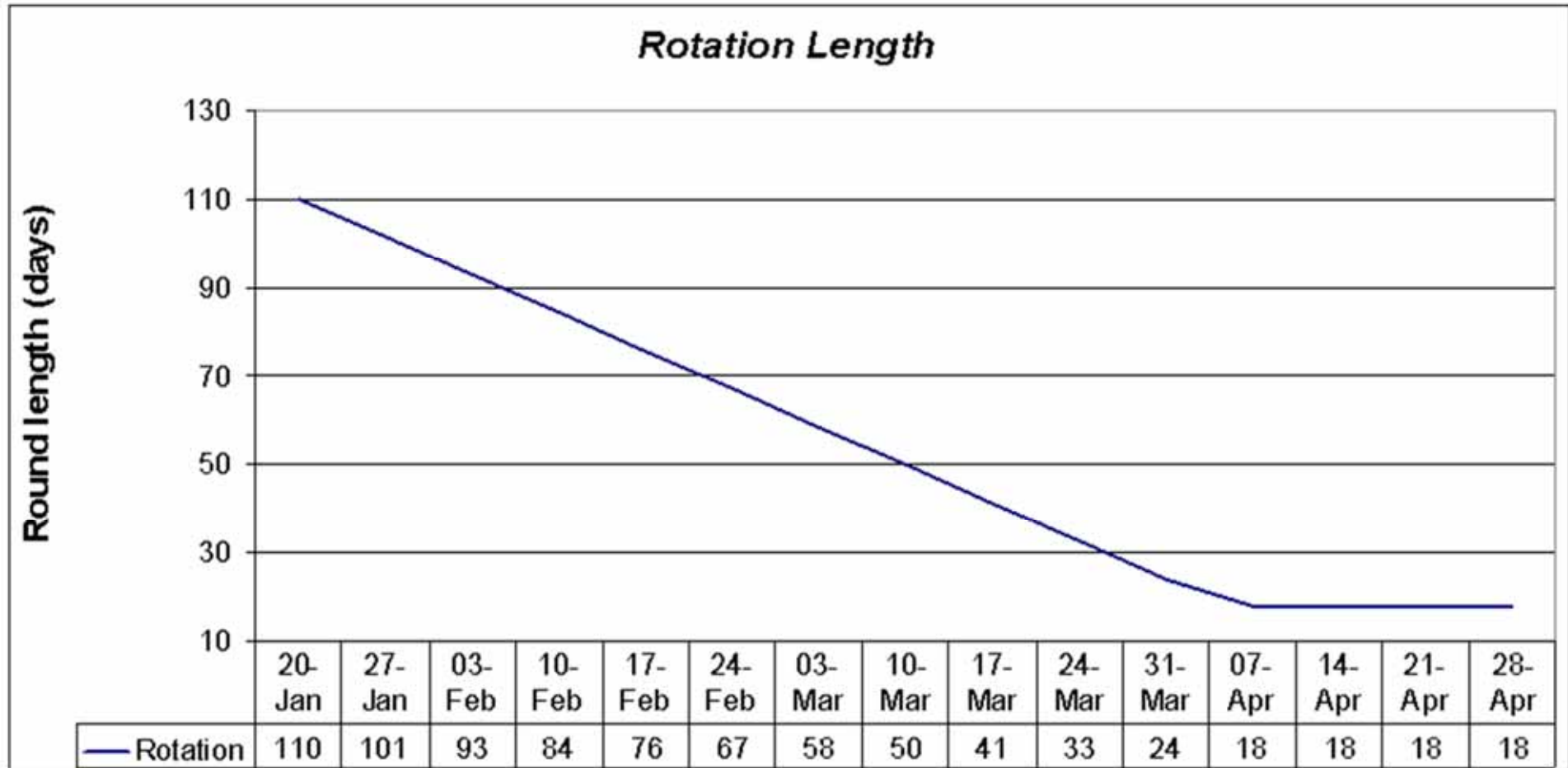
Importance of Grass Measurement



Spring Grazing Management Guidelines

- Use spring grazing rotation planner
- Consult farm grass cover targets
- Grazed to a post-grazing residual of 3.5 to 4 cm
- On/off graze during wet weather
- Use nutrient efficiently
- A strip wire must be used to allocate grass on a 12-hour basis

Spring Grazing Rotation Planner



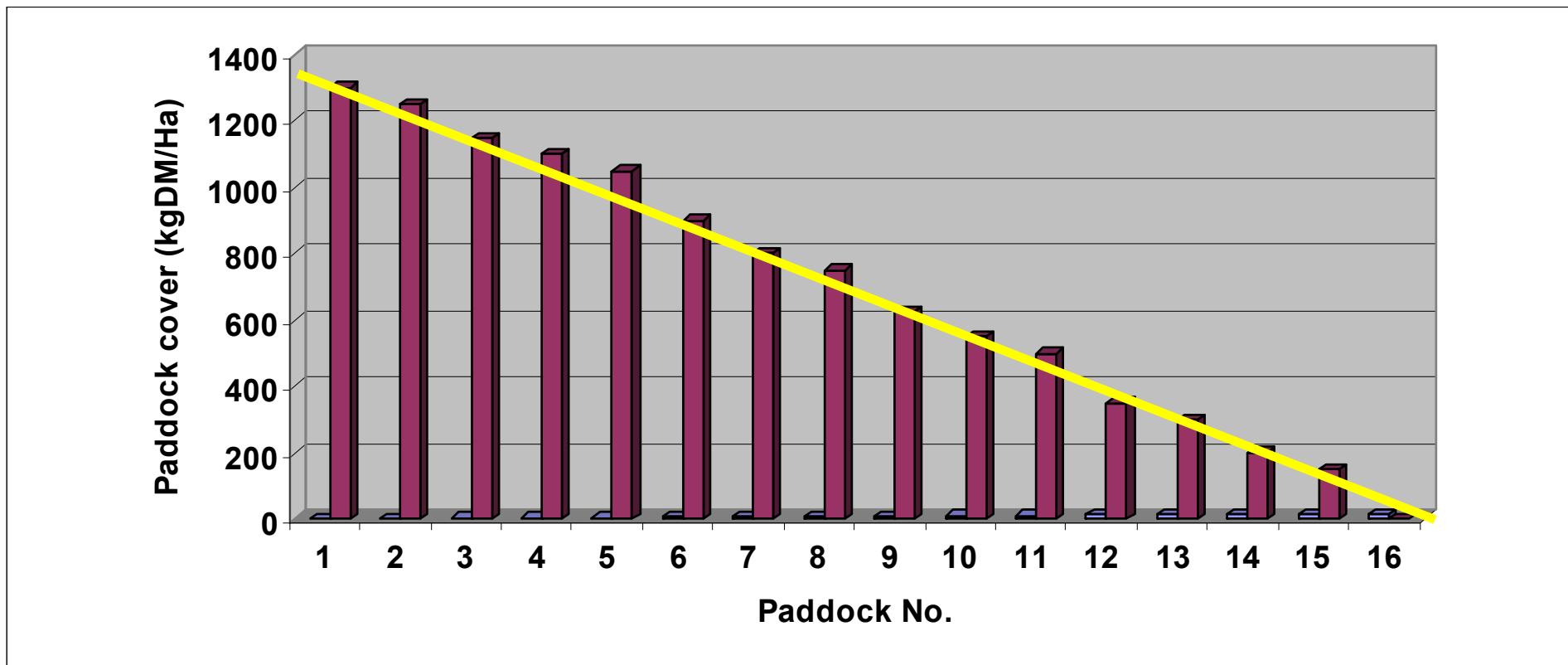
Mid-season Grazing Management

- Extends from early-April to early-August
- Use Grass Wedge to determine grass supply
- Grazed to a post-grazing residual of 3.5 to 4.5 cm
- Target pre-grazing yield 1,200 to 1,500 kg DM/ha
- Surpluses and deficits require immediate intervention

Understanding Your Grass Wedge

Pre-grazing cover = Stocking rate (4.5 cows/ha)*Allocation (16 kg DM/cow)

* Rotation length (19 days) + residual (3.5 cm= 0 kg DM/ha)= 1369 kg DM/ha

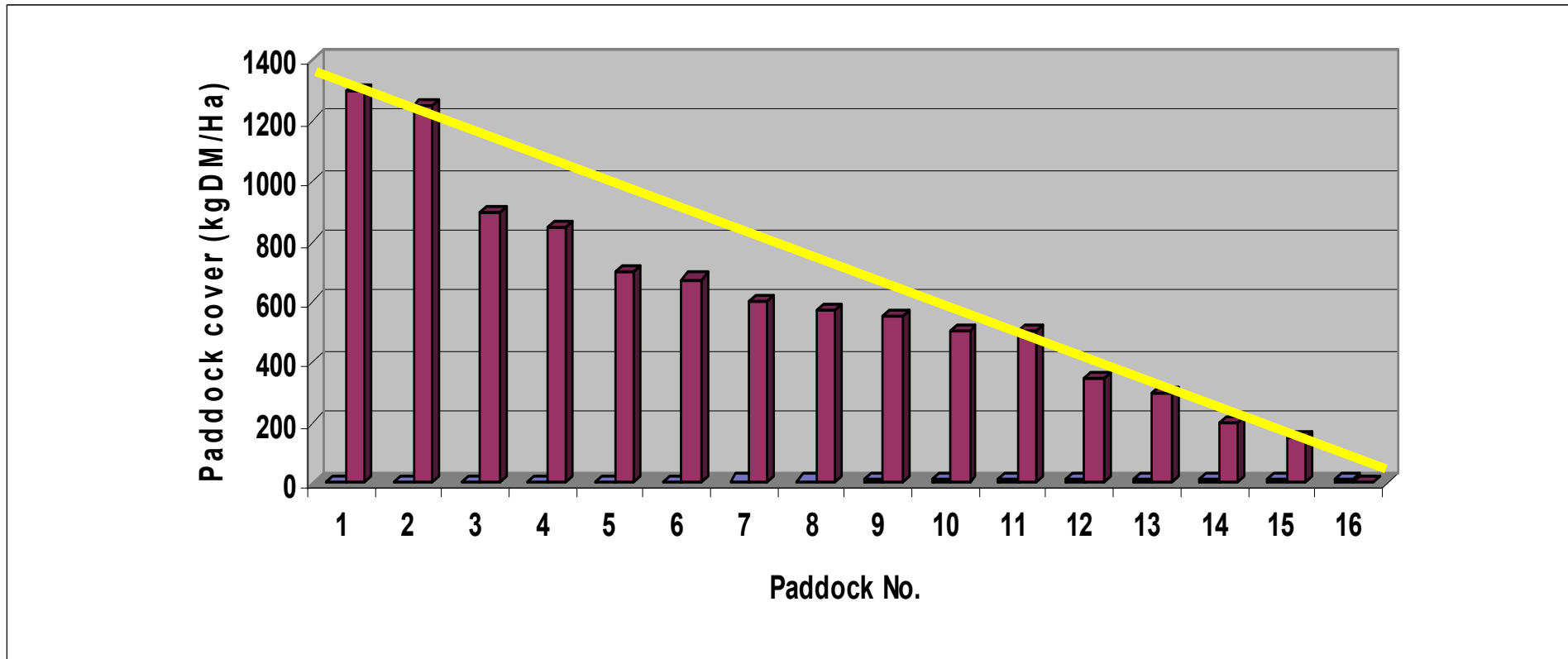


Adequate Grass Supply

Understanding Your Grass Wedge

Pre-grazing cover = Stocking rate (4.5 cows/ha)*Allocation (16 kg DM/cow)

* Rotation length (19 days) + residual (3.5 cm= 0 kg DM/ha)= 1369 kg DM/ha

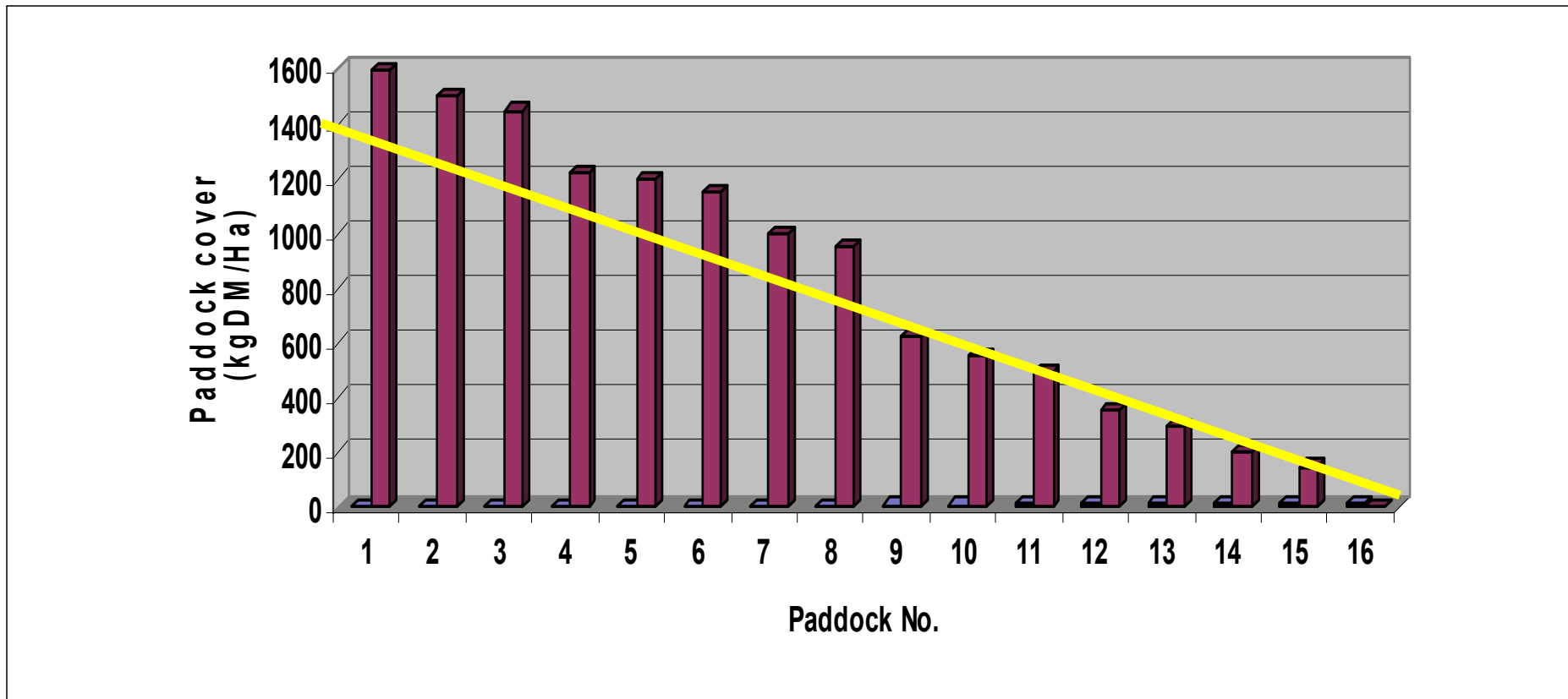


Inadequate Grass Supply

Understanding Your Grass Wedge

Pre-grazing cover = Stocking rate (4.5 cows/ha)*Allocation (16 kg DM/cow)

* Rotation length (19 days) + residual (3.5 cm= 0 kg DM/ha)= 1369 kg DM/ha



Surplus Grass

Autumn Grazing Management Guidelines

- Increase rotation length from mid-August
- Highest farm grass-covers in mid- to late-September
- Close first paddock for spring grazing early/mid-October
- 60% of farm closed by 1st week in November
- All paddocks grazed to post-grazing residual 3.5- 4 cm

5. Opportunities to Further Increase the Efficiency of Grass Based Systems

1. Grass-breeding and evaluation

2. Sward species composition

3. Increase sustainability

4. Grass budgeting

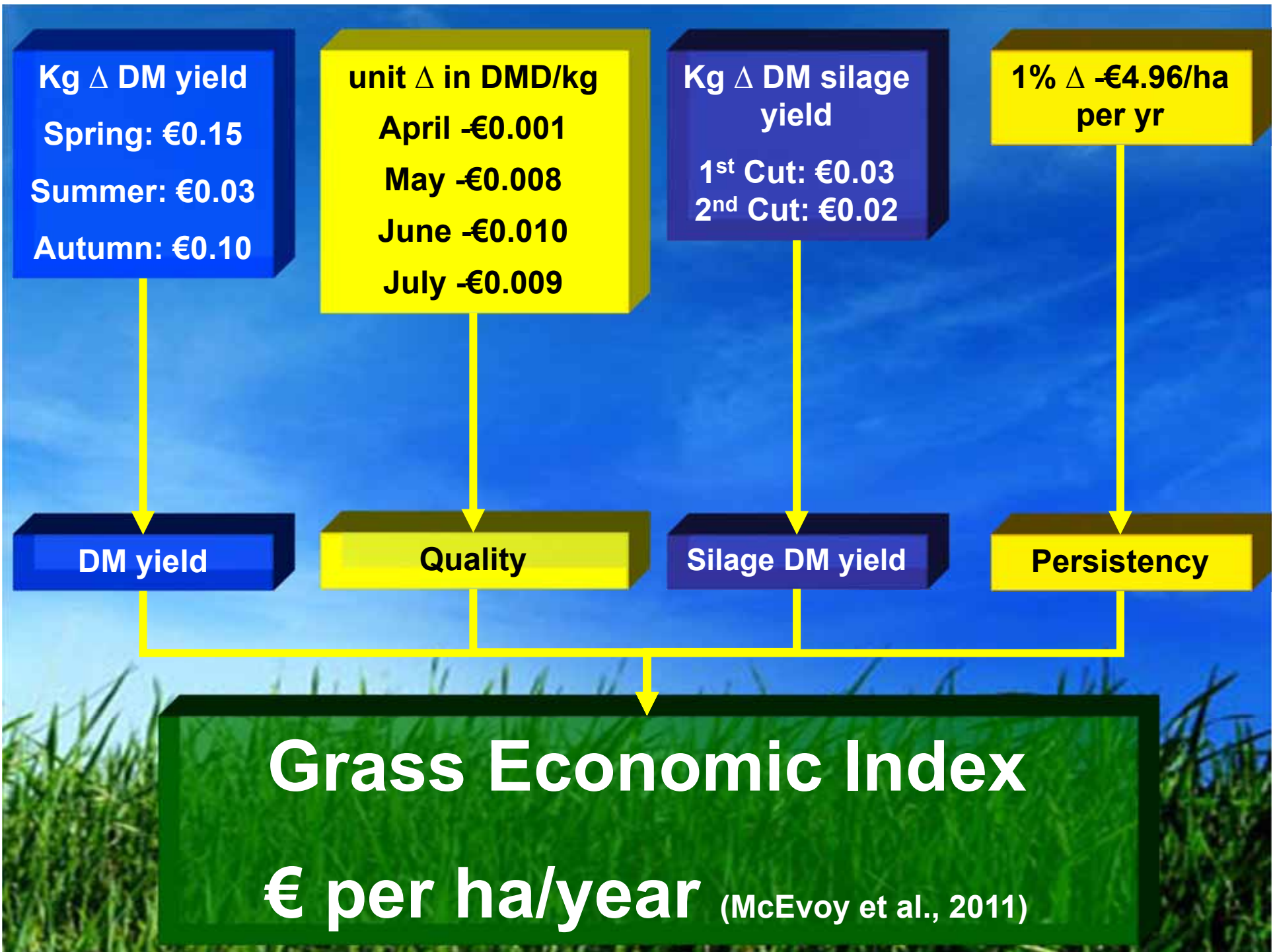
Grass-breeding and Evaluation

In EU Grass Breeders have increased DM yield by 0.5%/year 1965-1990 (Van Wijk and Reheul 1991)

→ however little evidence of increased animal performance (Lee et al., 2012)

Possible Reasons:

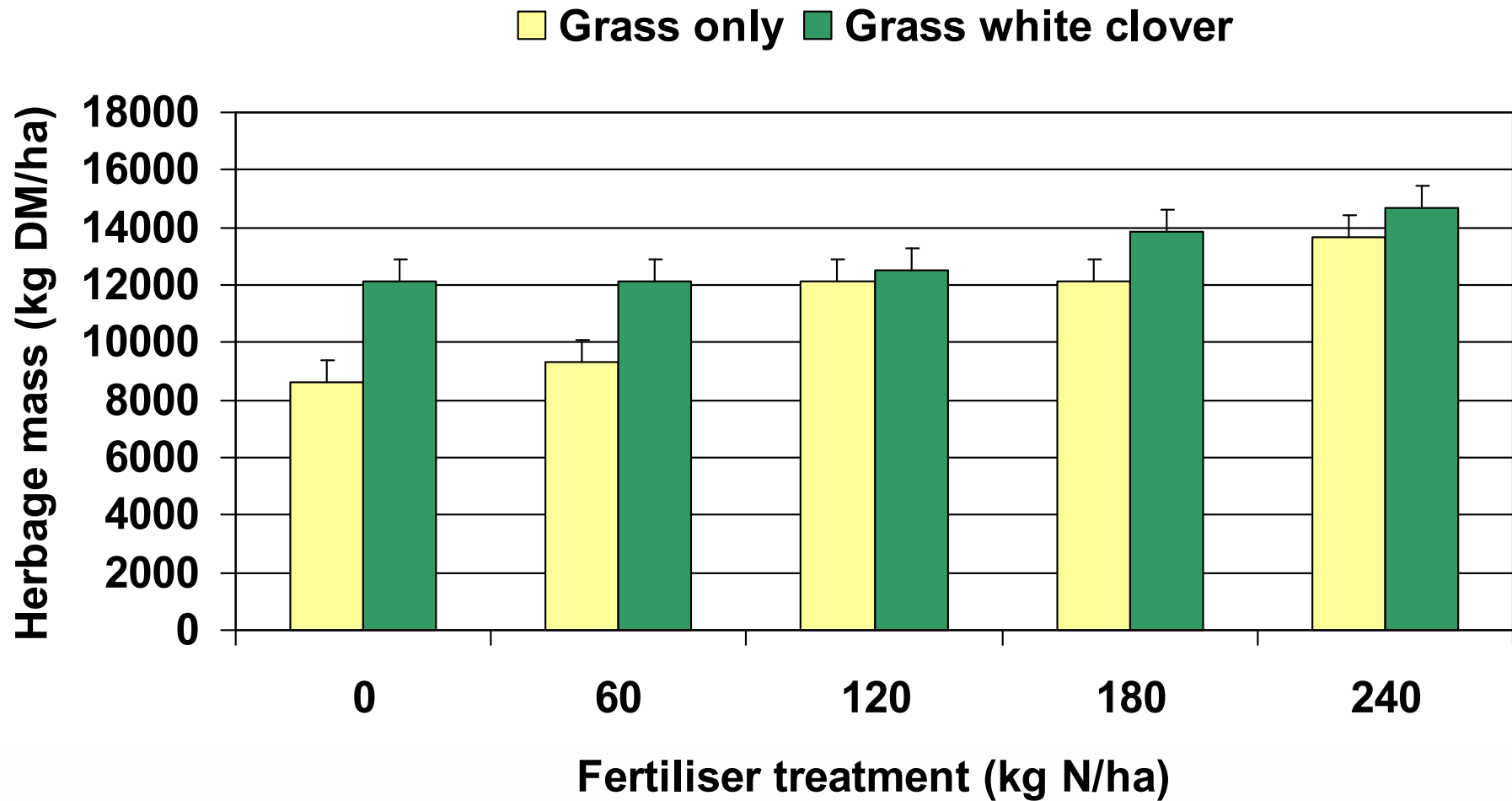
1. Protocol used- silage versus simulated grazing
2. On farm evaluation versus cutting plot
3. Breeding objectives better reflect animal requirements



Sward Species Composition

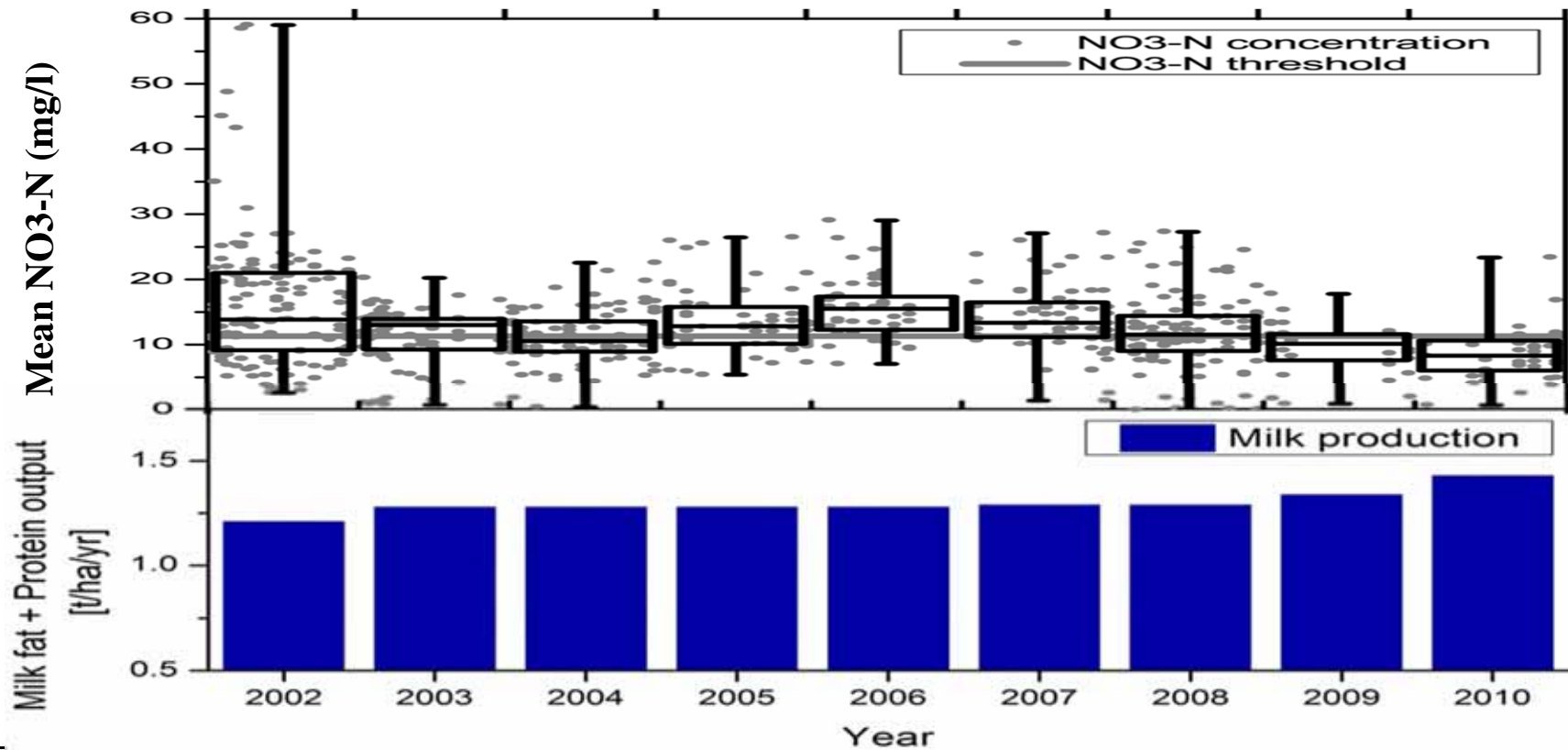


Three Years Herbage Production (2010-12)



(Enríquez-Hidalgo et al., 2013)

Farm Management Practices and Nitrate loss 2002 -2011



Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Stocking rate (cows/ha)	2.25	2.44	2.44	2.44	2.63	2.63	2.67	2.92	2.88	2.88	2.88
Grazing days (No.)	231	272	293	291	295	273	306	301	287	282	285
N application (kg/ha)	294	294	289	296	331	259	313	244	248	252	251
NO ₃ - N concentration (mg/l)											
Mean		16.0	11.1	10.2	13.3	15.2	12.4	12.2	9.7	7.3	6.6
Minimum		2.6	0.7	0.4	5.5	7.1	1.4	0	0.9	0.7	1.2
Maximum		59.1	20.3	22.7	26.5	29.1	27.2	27.4	17.9	23.5	20.6

Importance of Grass Measurement & Budgeting: PastureBase Ireland



Thank you!



Acknowledgements: Dairy Levy Trust and

