Science and Innovation in Grassland

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Why Grassland?

• Grassland, including rough grazing, dominates the UK landscape accounting for around 70% of agricultural land area.

• Grass and forage make a major contribution to the ruminant livestock sector – 50% of diet in dairy cows, 80-85% in beef cattle and 90-95% in sheep (cheapest feed source).

• Consumers prefer livestock products from grass-based systems.

• Fatty acid content of milk and meat from grass–based systems is ‘healthier’ than from other systems.

• Grassland also contributes to a wide range of ecosystem services – C sequestration, flood risk mitigation etc.
The Opportunity

• Significant underutilization of UK grassland is costing the UK ruminant livestock sector in excess of £1600 m per annum - **this represents 50% of current subsidy support.**

• A renewed focus on grassland management and utilisation and application of current technologies:
  - significantly improves farm profitability and product quality
  - reduces nutrient loss to the environment
  - enhances carbon sequestration from grassland.
Consumer Preference

- Strong consumer preference for animal products produced from grazing systems.
- Legislation in a number of European countries ensuring minimum grazing period during summer months.
Grass Enhances Beneficial Omega-3 in Lamb and Beef

(Scollan et al 2017)
Relationship Between Grass Utilisation and Profit

![Graph showing the relationship between Profit/Dairy Ha - Kg DM Utilised/Ha. The graph includes a linear regression equation: y = 0.2673x - 1255.5, with an R² value of 0.5556.](image_url)
## Grass Production and Utilisation

<table>
<thead>
<tr>
<th>Grass yield (t DM/ha)</th>
<th>Experimental plots</th>
<th>Highest yielding fields</th>
<th>Top 1% dairy farms</th>
<th>Average UK dairy</th>
<th>Average UK beef</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20+</td>
<td>18</td>
<td>12</td>
<td>7.5</td>
<td>4.1</td>
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</tbody>
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(Mayne and Bailey, 2016)
Opportunity Cost of Low Productivity

• Each additional 1 t DM/ha worth
  - £334/ha for milk production (@28ppl)
  - £204/ha for beef production (@380 p/kg)

• Increasing grass utilisation by 1 t DM/ha across the 6.12 million ha of permanent grassland could increase net margin by £1.64 bn per year

• This is equivalent to half of the current subsidy payment to UK agriculture
Innovation in Grassland Systems

- Exciting array of cutting edge technology now available to manage intensive grassland in the same way as arable crops
- Precision feeding of grazing livestock is the new buzz word!
  - Opportunity to optimise productivity whilst protecting the environment
- Grass breeding in UK now focussed on sustainability and nutrient efficiency.
Soil pH – UK Grassland Soils

Source: Fisher, 2013

- 5 – 30% DM yield loss!
- Reduced nutrient efficiency!
AFBI Precision Grassland Platform

- High-tech research platform which enables the collection of detailed information on soil, plant and animals

Similar investment in England - Rothamsted North Wyke Farm Platform – sustainable production systems
Measuring Pasture Growth from Space

Percentage difference from average accumulated biomass for the period April 1-May 24th

Based on NASA MODIS data created by Stuart Green, REDP, Teagasc
GrassCheck - Grass Growth Monitoring

Week Beginning 28 May 2018

**Weekly Grass Growth (kg DM/ha/day)**
- GrassCheck plots: 113.1
- Dairy farms*: 80.4
- Beef & sheep farms*: 74.8
- Forecast: 113.8 (7 day), 93.1 (14 day)

**Grass Quality**
- **Plots**
  - DM (%): 17.8
  - ME (MJ/kg DM): 10.5
  - CP (% DM): 15.2
  - WSC (% DM): 13.8
- **On-farm**
  - DM (%): 17.1
  - ME (MJ/kg DM): 11.6
  - CP (% DM): 15.9
  - WSC (% DM): 16.6

*On-farm grass growth data supplied by AgriNet
GrassCheck plots receive 270 kgN/ha/year

**Management Notes:**
- Growth has remained strong again this week and with continued good weather forecast, total growth for May is expected to be above the long-term average of 2t DM/ha. With soil moistures falling in eastern counties it is likely that growth will start to be restricted in these areas.
- Grass quality has fallen with many plants now entering the reproductive phase and generating seed heads. Pre-mowing, topping or taking out paddocks for silage will help remove this fibrous material and ensure good quality at the next rotation.
- More information on GrassCheck will be available at the AFBI Dairy Open Day on 6 June 2018. Visit afbini.gov.uk/events for event details.
Cultivar Evaluation -
Teagasc Pasture Profit Index
€ per ha/year

DM yield
Spring: €0.16
Summer: €0.04
Autumn: €0.11

Grass quality
April: €0.001
May: €0.008
June: €0.010
July: €0.009

Silage yield
1st Cut: €0.04
2nd Cut: €0.03

Persistency –
12 year baseline

-€56 per year

Total Grass yield

Quality

Silage yield

-€56 per year
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Unique opportunity to develop policies which refocus attention on the productive potential of our greatest national resource – grassland, whilst enhancing the UK’s natural capital, improving farm profitability and achieving wider environmental benefits.