Food harvest 2020 - 50% increase in milk production, 40% and 20% in beef and sheep value

Abolition of milk quotas in Ireland 2015 – Irish industry is getting ready for expansion

New entrants to dairying, conversions of beef/tillage to dairying

In future, more productive animals to feed – require more productive swards

Improve competitiveness on milk production costs

Achieve by greater efficiency in grass growth and utilization
  • Grass measurement is critical
  • More knowledge on grass cultivars is critical, more genetic gain

Development of new grassland technologies

More genetic gain progress in grass breeding

Pasture Base is an important step - direct to grassland farmer
What has been achieved in perennial ryegrass

Genetic gain per decade (%)

Forage yield

Grain yield

- P. ryegrass: 5%
- W. clover: 6%
- Oats: 8%
- Barley: 10%
- Wheat: 21%
- Maize: 24%
Until Now

• Low reseeding levels - 2%
• Little national impact
• No measure of commercial grassland farm performance
• Questions on what has grass breeding delivered for the commercial farmer?
• No feedback from end user
New Challenges & Focus

- 1% increase in grass utilisation - €27million nationally
- Require Reseeding levels at 5 - 8%
- Quantify grassland performance on farms
- Require farmer/farm data feedback
- Identify and focus on most profitable grasses - increase genetic gain
- Identify the most profitable traits
- Deliver more profit for the industry
Grasses for the Future conference 2010 – Gap in Knowledge

• Require measurement of grass cultivar performance at farm level
• Quantify grass growth and DM production on-farm using a common measurement methodology
• Quantify grass cultivar performance at commercial farm level
• National grassland database – commercial farmers data, used for industry gain
Grass Evaluation Department of Agriculture

Common Objectives

Data capture

Grass Breeding Programs

Grassland farmers

National grassland database

Commercial industry and Extension

Grassland Research

Grass economic index

PastureBaseIreland
• Web based grassland management decision support tool – Front end
• Grassland data base – back end
• PBI has different roles for users - Farmer > Group Leader > Researcher > Administrator (Vincent Griffith)
• Capture grass production data weekly (farmer recorder)
• Core measurement is pre-grazing herbage mass / farm cover
• PBI stores the measurements in a common structure
  • Background data e.g. cultivar, soil type, topography, drainage
  • Other inputs to the farm system also recorded, e.g. fertiliser, slurry applications, reseeding date, cultivation methods etc.
• Link with local Met Eireann meteorological data
Functions of PBI – Decision support Tool

Decision support system

- Spring/Autumn Rotation planner
- Grass Wedge
- Grass Budget
- Grass wedge, Growth distribution, paddock summary
- Sharing of data - comparison and benchmarking of grass management between farms
- Currently 140 farms nationwide using PBI – across enterprise (dairy, beef and sheep)

The Irish Agriculture and Food Development Authority
Functions of PBI – Grass cultivar evaluation – commercial farms

- Paddock is unit of measurement – data linked
- Grass cultivar data capture from commercial farms
- No measure of cultivar performance at commercial farms, no end user feedback
- Grass cultivar persistence and longevity
On Farm cultivar study

- Investigating the persistency and performance of perennial ryegrass cultivars
- DM yield measured, Paddock summary report (total and seasonal)
- Persistence – ground score change - annual
- Life time performance of swards
- Reseeding thresholds
- Long term study

Currently 74 farms involved - >100 farms

Fig. 1 Location of some farms involved in study
What farmers are been recruited

• Measurement history - measuring grass routinely (weekly)
• Still measuring in 10 years time
• Using farmers from discussion groups, Dairymis, Blackwater, Greenfield, Crookstown, Bride & Blackwater, Damour, 80/20, Co-op Monitor farms
• Research Dairy farms (Curtins, Moorepark, Dairygold, Solohead, Johnstown Castle, Ballyhaise, Clonakility, Kildalton)
• Greenfield programme and Heavy soils programme
• Athenry, Grange, Johnstown Castle beef herds
• 30+ Better beef farm herds, 4 better farm sheep farms
• Aim for 600 farms in 2016
On Farm evaluation

- Control cultivar sown on all farms
- Each farm has a minimum of 2 cultivars
- Maximum number of cultivars on any farm is 7
- All recommended list varieties and will concentrate on recently recommended cultivars
- Cultivars sown as monocultures (with or without clover)
Functions of PBI – Grass economic index and new concepts

- Quantification of DM production across farms - different
  - Enterprises
  - Grassland management systems,
  - Regions and soil type
  - DM production values will eventually be used as the base value within index

- Persistence – investigate ground score change over time
Functions of PBI – Grass economic index and new concepts

• Performance/challenge of cultivars in plots is not the same as in paddocks
• Cultivar longevity on farms – what is it?
• Pasture quality – base line measurements from farms
• Grazing out scores - palatability, farmer preference scores
• Performance of cultivars on commercial farms (DM yield stability) – feed back other issues (plant pulling, re...
Results - Year 1

- Average production on 40 farms - 11.2 t DM/ha
- Large variation between farms in terms of DM production ranging from 16 t DM/ha to 8 t DM/ha.

<table>
<thead>
<tr>
<th></th>
<th>Mean of all paddocks (kg DM/ha)</th>
<th>Std Dev</th>
<th>Minimum (kg DM/ha) (Paddock)</th>
<th>Maximum (kg DM/ha) (paddock)</th>
<th>Range (kg DM/ha)</th>
<th>Coeff of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>All farms</td>
<td>11.2</td>
<td>2.8</td>
<td>3.1</td>
<td>19.9</td>
<td>16.8</td>
<td>24.9</td>
</tr>
<tr>
<td>Dry farms</td>
<td>11.4</td>
<td>2.8</td>
<td>3.6</td>
<td>17.7</td>
<td>14.1</td>
<td>25.6</td>
</tr>
<tr>
<td>Wet Farms</td>
<td>10.9</td>
<td>2.8</td>
<td>3.1</td>
<td>19.9</td>
<td>16.8</td>
<td>24.5</td>
</tr>
</tbody>
</table>

The Irish Agriculture and Food Development Authority
## Results

Large variation in paddock performance within farms

<table>
<thead>
<tr>
<th>Farm</th>
<th>Average DM production (t DM/ha)</th>
<th>Std dev</th>
<th>Coeff var</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8.5</td>
<td>3.2</td>
<td>0.37</td>
</tr>
<tr>
<td>2</td>
<td>9.5</td>
<td>3.2</td>
<td>0.34</td>
</tr>
<tr>
<td>3</td>
<td>9.3</td>
<td>2.6</td>
<td>0.28</td>
</tr>
<tr>
<td>4</td>
<td>9.7</td>
<td>2.3</td>
<td>0.24</td>
</tr>
<tr>
<td>5</td>
<td>9.0</td>
<td>1.9</td>
<td>0.21</td>
</tr>
<tr>
<td>6</td>
<td>13.3</td>
<td>2.6</td>
<td>0.19</td>
</tr>
<tr>
<td>7</td>
<td>12.3</td>
<td>1.7</td>
<td>0.13</td>
</tr>
<tr>
<td>8</td>
<td>13.6</td>
<td>1.8</td>
<td>0.14</td>
</tr>
<tr>
<td>9</td>
<td>16.2</td>
<td>1.5</td>
<td>0.09</td>
</tr>
<tr>
<td>10</td>
<td>13.9</td>
<td>0.7</td>
<td>0.05</td>
</tr>
</tbody>
</table>
## Seasonality difference in DM production between 11 and 13 t DM farm

<table>
<thead>
<tr>
<th></th>
<th>Spring</th>
<th>Summer</th>
<th>Autumn</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>11 t DM/ha</td>
<td>0.6</td>
<td>5.8</td>
<td>4.7</td>
<td>11.0</td>
</tr>
<tr>
<td>13 t DM/ha</td>
<td>1.5</td>
<td>6.7</td>
<td>4.8</td>
<td>13.0</td>
</tr>
</tbody>
</table>
## Differences in Paddock performance between farms

- 1 ton DM utilised - €160/ha

<table>
<thead>
<tr>
<th></th>
<th>11t DM/ha</th>
<th>€/ha</th>
<th>13t DM/ha</th>
<th>€/ha</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Top 33%</strong></td>
<td>12.7</td>
<td>448</td>
<td>14.2</td>
<td>627</td>
</tr>
<tr>
<td><strong>Middle 33%</strong></td>
<td>11.3</td>
<td>269</td>
<td>12.9</td>
<td>320</td>
</tr>
<tr>
<td><strong>Bottom 33%</strong></td>
<td>9.2</td>
<td>Base - €0</td>
<td>11.8</td>
<td>Base - €0</td>
</tr>
<tr>
<td><strong>Within farm difference</strong></td>
<td>€9,321</td>
<td></td>
<td>€5,810</td>
<td></td>
</tr>
<tr>
<td><strong>Between farm difference</strong></td>
<td></td>
<td></td>
<td>– €9,984</td>
<td></td>
</tr>
</tbody>
</table>
Industry Requirements –
Addressing low DM production, how cultivars perform

- Perennial ryegrass content is low on commercial farms – why?
- Soil fertility is also low
- Measurement will identify the poorer producing paddocks
- Measurement will identify the better performing cultivars or mixtures
- Persistency – require to investigate ground score change over time (needs more research)
- Why is there such large DM production differences within farms?
- How long do swards last on farms?
- How much do they produce in their lifetime?
- What is the indicator to the farmer to reseed - DM production, ground score, animal preference
Future work

• PBI - will be rolled out further in 2014
• More farms to be recruited to grass cultivar project
• Data from PBI – will be linked to the grass economic index
• Move to recruit more farms especially in Northern half of country, Better beef and sheep farms
• Investigate performance of different mixtures in coming years
• Investigate the possibilities of molecular mapping swards over time – what/what proportion of sown cultivar/s have persisted
Acknowledge –

Dairy Levy Funding – Irish dairy farmers

Questions