Grassland Science Department

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Agriculture and Food Development Authority

Presentation Content

- Importance of Grass
- Department Description
- Program Areas
- Project Focus
- Impacts and Relevance
- Future Challenges

Importance of Grazed Grass to Ireland

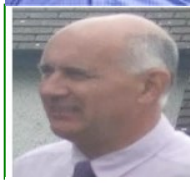
- **Produced inside Farm Gate**
- **Reliable production:11 - 15t DM/ha (high farm variation)**
- **Cost €75/t DM ; First cut Silage €185/t DM; Concentrate €260/t DM**
- **Sustainable, repeatable and resilient system**
- **Low cost input – industry to cope with volatility**

1. Objective to improve relationship between pasture utilised and profit/ha

2. Ensure the sustainability of grassland based systems

3. Leading science based grassland department with substantial industry impact

Department Structure & Staffing

- Across Enterprises – Dairy, Beef, Sheep and Grass Breeding
- 4 Sites – Moorepark, Grange, Athenry, Oakpark
- 12 Research staff, 1 Post Doc
- 2 Technologists
- 2 Technicians, 4 contract Technicians
- 24 Walshfellowships
- Budget €2.163m

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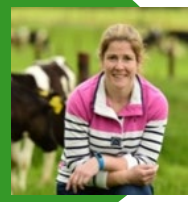
Research Program Areas



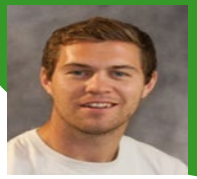













Grazing Management

Soil fertility & Nutrient use

Grass Breeding & Evaluation

Grassland Research Dairy/Beef/Sheep

Grass growth, dynamics & utilization

Grass feed & Value

Projects Presented:

- Sheep grassland research
- Clover research
- Pasture Profit Index
- PastureBase Ireland

Athenry: Sheep Grassland Study

Investigation into the effects of stocking rate and ewe prolificacy on lamb production from grassland based production systems

Key areas:

- Stocking rate
- Prolificacy
- Grass supply and demand
- Lamb performance at pasture

Stocking Rate

- Low (10 ewes/ha)
- Medium (12 ewes/ha)
- High (14 ewes/ha)

Prolificacy

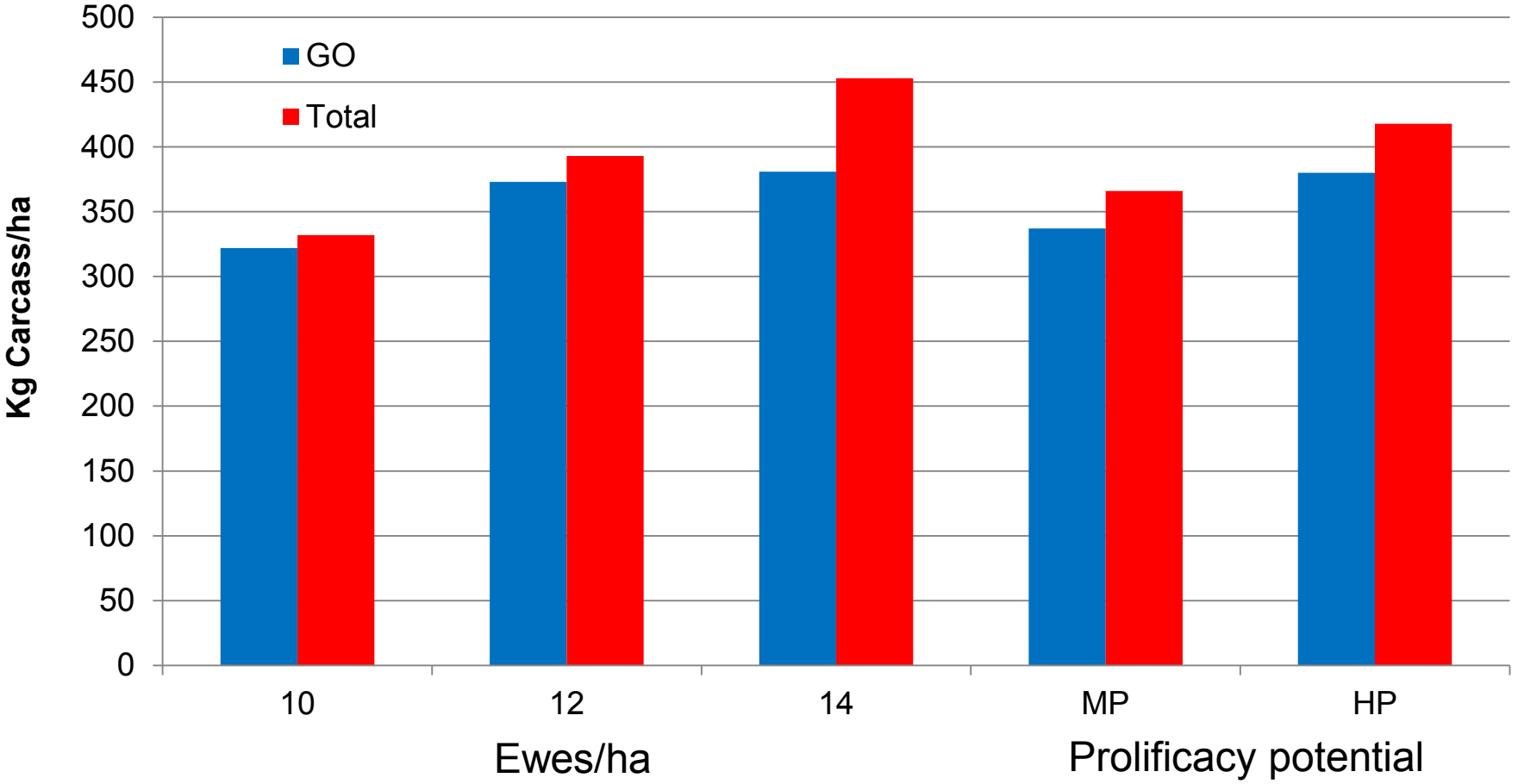
- Medium (1.5 lambs weaned/ewe)
- High (1.8 lambs weaned/ewe)

Grass utilised per hectare, per ewe and per kg of carcass output

	Stocking Rate			Prolificacy				
Parameter	**10 ewe/ha**	**12 ewe/ha**	**14 ewe/ha**	**Medium**	**High**	**SR**	**PP**	**Inter.**
Grass utilised (Kg DM/ha)	**9071^{a}**	**10141^{b}**	**11560^{c}**	**10224**	**10232**	***	NS	NS
Kg Grass DM utilised per ewe	**907^{a}**	**845^{b}**	**826^{b}**	**856**	**857**	***	NS	***
Kg grass DM utilised per kg carcass	**28.0^{a}**	**26.4^{b}**	**26.3^{b}**	**26.2**	**25.0**	**	**	NS

PP = Prolificacy potential
SR = Stocking Rate

Effect of stocking rate and ewe prolificacy potential on carcass output/ha



GO=grass only, Total = grass + supplement

The effect of tetraploid and diploid swards with & without clover on the productivity of spring milk production systems

- 4 treatments
  - Tetraploid sward - TO
  - Diploid sward - DO
  - Tetraploid + clover sward (+ 2 kg clover/acre) - TC
  - Diploid + clover sward (+ 2 kg clover/acre) - DC
- Separate farmlet of 20 paddocks for each treatment
- 30 cows per treatment

Milk Production Results 2014-2016

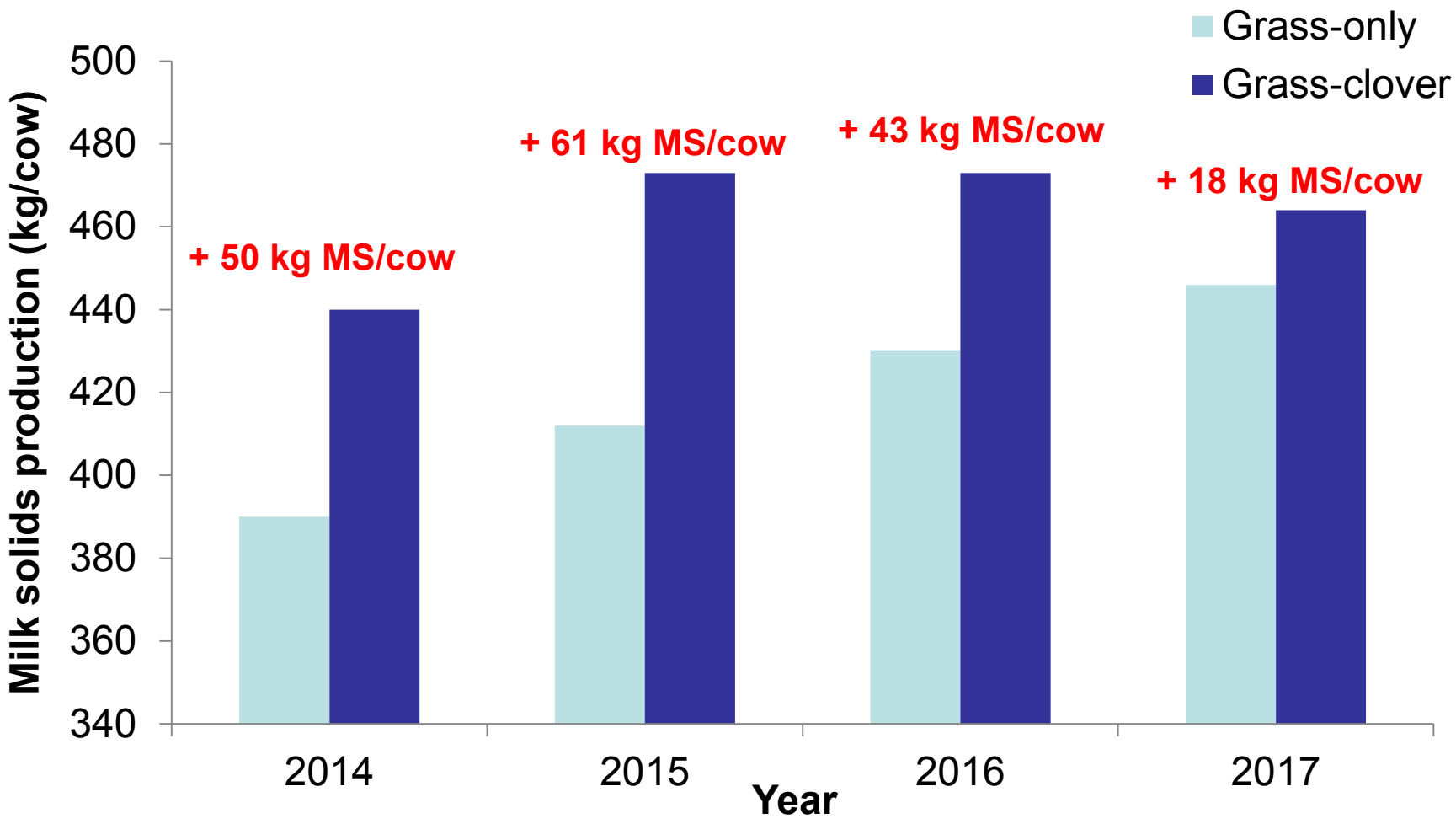
	Tetraploid	Diploid	Tetraploid + clover	Diploid + clover
Pasture DM production (t DM/ha)	15.6	15.4	17.1	16.9
Milk yield (kg/cow)	5,086	5,110	5,842	5,809
Fat (%)	4.65	4.64	4.62	4.63
Protein (%)	3.79	3.73	3.73	3.73
Milk solids (kg/cow)	429	426	487	484
Milk solids yield (kg/ha)	1,180	1,172	1,339	1,331

728 kg/cow

58 kg/cow

159 kg/ha

Milk solids production to 22/10: 2014-2017



Pasture Profit Index

Total merit index developed to assist in variety selection

- **Assigns an economic value to important traits of grass performance**
- **Define the total economic merit of a variety (€ per ha per year)**
- **Rank cultivars on Total Economic Merit**

Traits of importance:

- **Seasonal DM yield**
- **Quality**
- **Silage DM Yield**
- **Persistency**

All Data generated from DAFM recommended list trials (5 locations)

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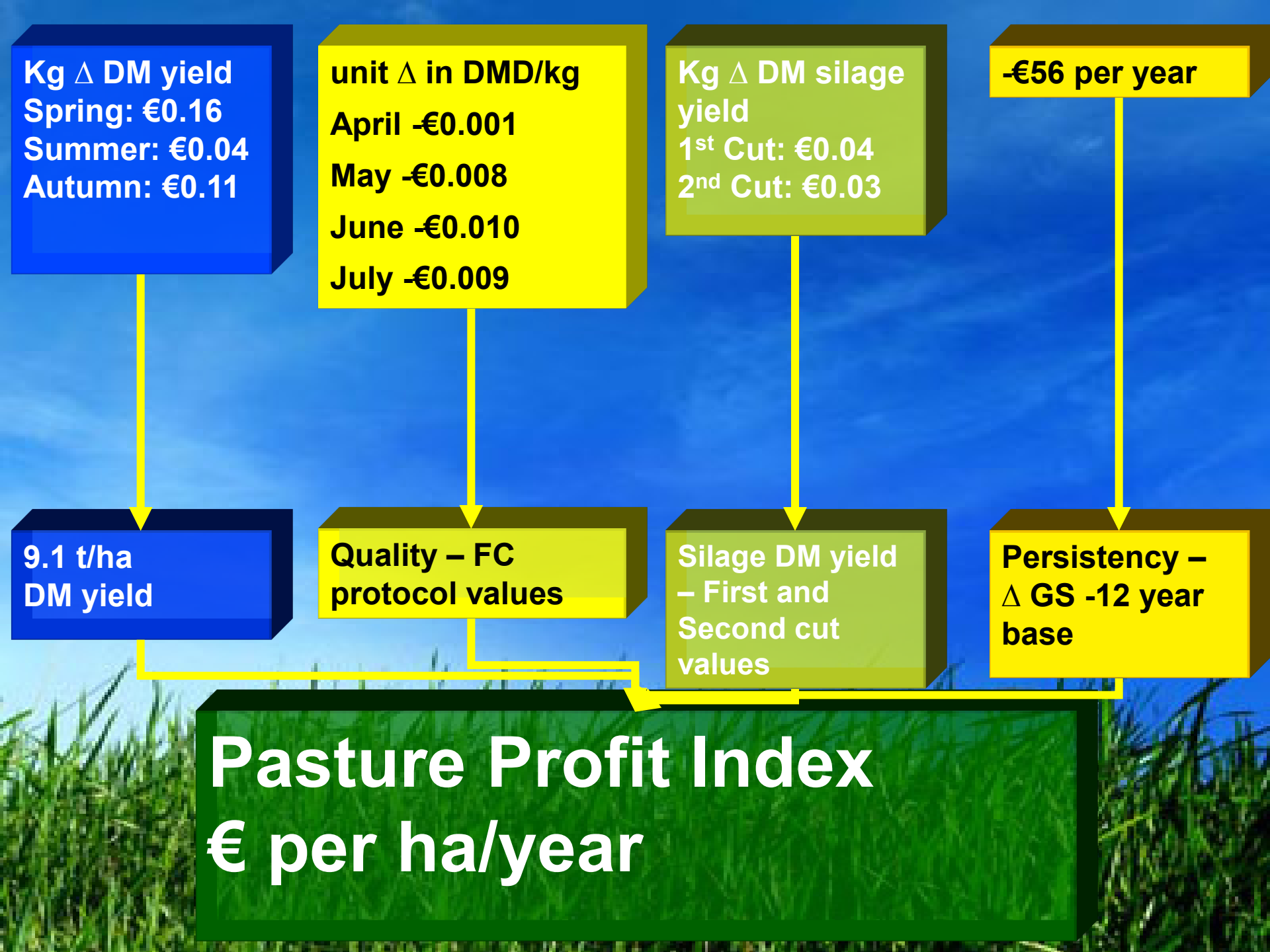
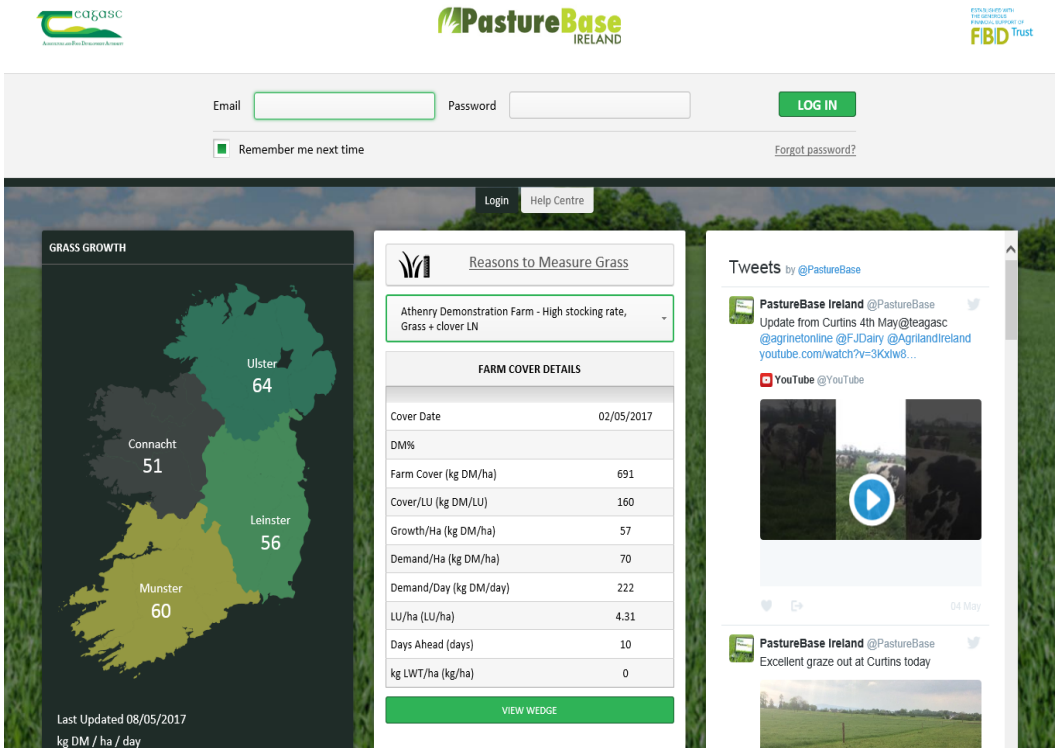

Kg Δ DM yield
Spring: €0.16
Summer: €0.04
Autumn: €0.11
unit Δ in DMD/kg
April -€0.001
May -€0.008
June -€0.010
July -€0.009
Kg Δ DM silage yield
1st Cut: €0.04
2nd Cut: €0.03
-€56 per year
9.1 t/ha DM yield
Quality – FC protocol values
Silage DM yield – First and Second cut values
Persistency – Δ GS -12 year base
Pasture Profit Index
€ per ha/year

Pasture Profit Index (PPI) – 2017

Variety Details			PPI Sub-Indexes (€ per ha per year)						Pasture Profit Index Details
			DM yield						
Variety	Ploidy	Heading date	Spring	Summer	Autumn	Silage	Quality	Persistency	Total €/ha per year
AberClyde	T	May 26	44	49	34	19	59	0	206
AberMagic	D	May 31	36	51	68	11	33	0	199
Nifty	D	May 27	70	53	57	16	-7	0	191
Fintona	T	May 22	58	39	50	21	11	0	178
AberChoice	D	June 9	11	49	47	6	63	0	175
AberWolf	D	May 31	58	39	34	12	29	0	171
Rosetta	D	May 24	89	29	40	11	2	0	170
AberGain	T	June 05	17	44	42	20	64	-19	169
AberPlentiful	T	June 9	39	50	40	9	29	0	167
Seagoe	T	May 28	33	40	43	33	19	0	167
Dunluce	T	May 30	17	44	46	17	41	0	165
Meiduno	T	Jun 06	43	45	41	12	32	-11	163
Solas	T	June 10	8	43	55	15	30	0	151
Magican	T	May 22	46	33	33	23	6	0	141
Astonenergy	T	June 2	-9	36	38	61	5	0	131

Accepted Methodology 2017



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Original papers

PastureBase Ireland: A grassland decision support system and national database

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ABSTRACT

PastureBase Ireland (PBI) is a web-based grassland management application incorporating a dual function of grassland decision support and a centralized national database to collate commercial farm grassland data. This database facilitates the collection and storage of vast quantities of grassland data from grassland farmers. The database spans across ruminant grassland enterprises - dairy, beef and sheep. To help farmers determine appropriate actions around grassland management, we have developed this

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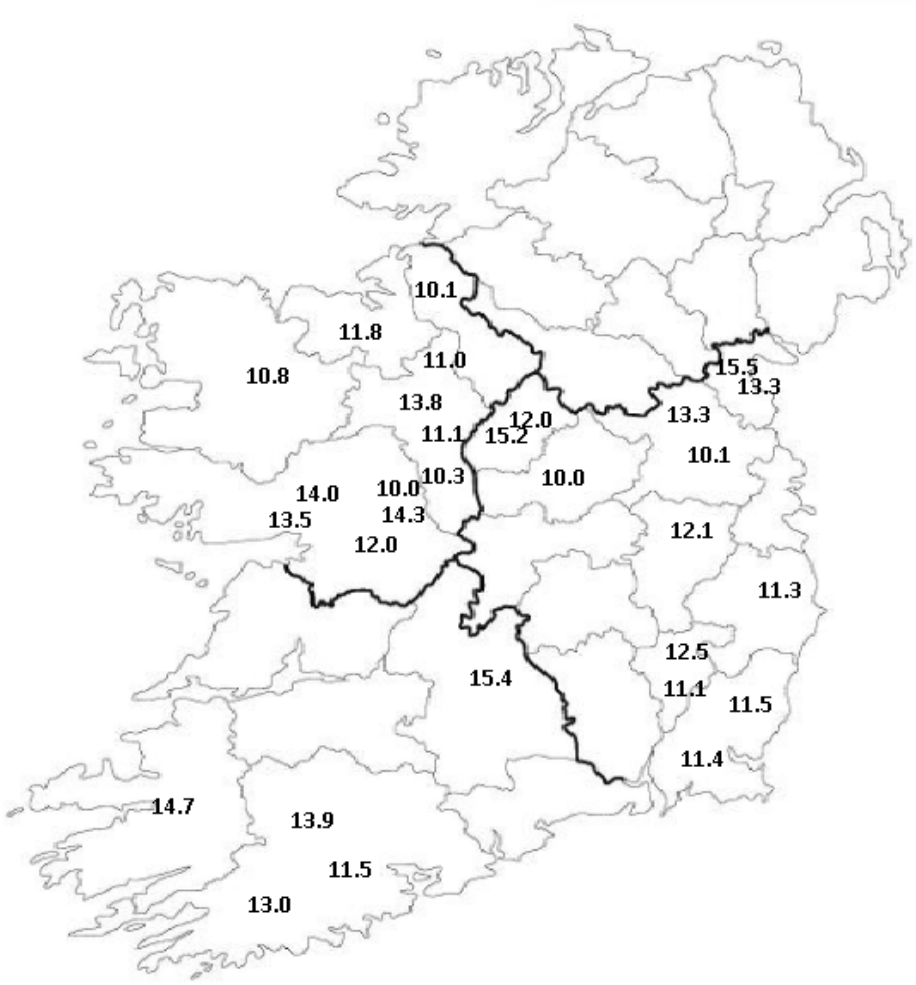
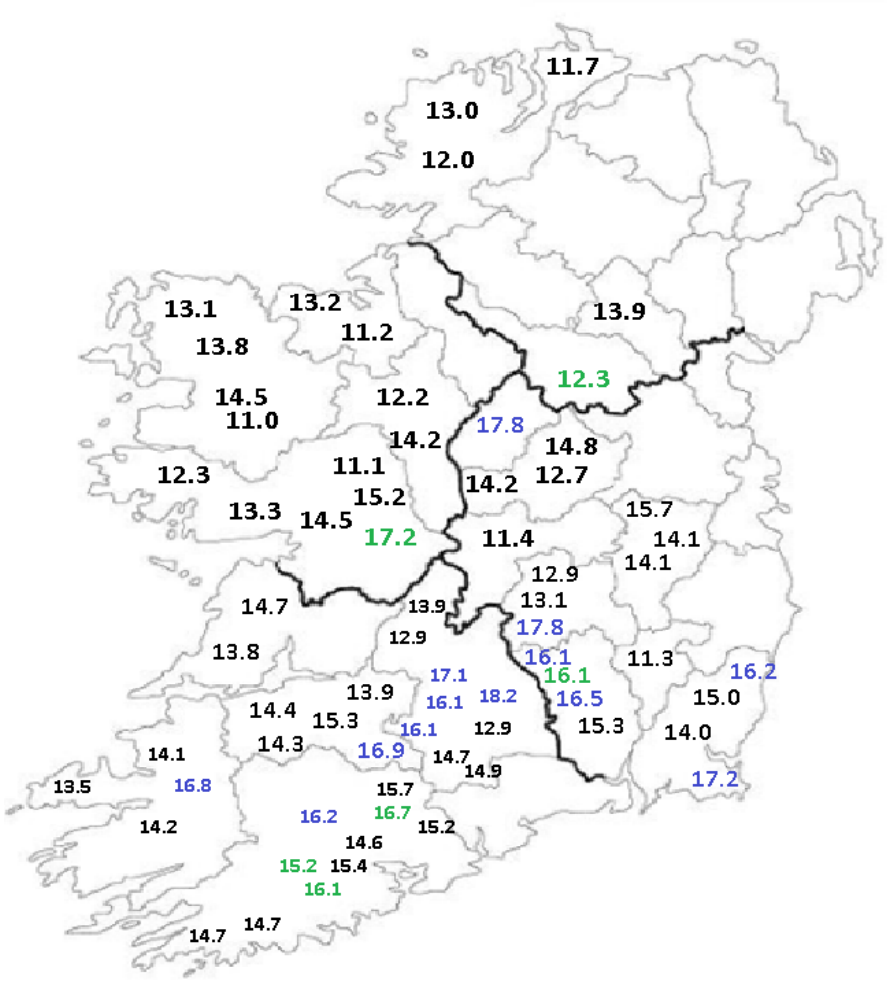
ESTABLISHED WITH THE GENEROUS FINANCIAL SUPPORT OF FBD Trust

DM Production 2016 - Drystock farms
12.2 t DM/ha



DM Production 2016 - Dairy farms
13.8 t DM/ha



- Grassland Research to Practise
- Foundation point for grassland data
- Usable across enterprises
- Bringing new innovations to research – on farm grass/clover variety evaluations

Impacts and Funding

- **Research on grazing management to increase utilization – On/off grazing work, early spring grazing and stocking rate publications**
- **Pasturebase Ireland, Pasture Profit Index, Clover research work**
- **Open days, Discussion groups, International groups, industry back up & workshops, visiting scientists**
- **Funding Sources – Goldcrop, DAFM (Stimulus), Horizon 2020 (0.8m in 2017)**
- **Dairy Levy, international grass seed companies**
- **DG-Agri Focus groups, Journal Reviewers, International invited speakers (New Zealand, Chile, France, Germany)**
- **Internal department and KT collaborations and link up**

Industry Links

- Department of Agriculture, Food and Marine
- Dairy Co-ops, Meat industry
- Grass seed industry (Goldcrop, Germinal)
- International Grass seed industry (DLF Seeds, Barenbrug, DSV/Eurograss, IBERS)
- Farming Press (IFJ, Farming Independent)
- Sheep Ireland, Volac, Keenans

Department of Agriculture, Fisheries and Food
An Roinn Talmhaíochta, Iascaigh agus Bia

GOLDCROP

BARENBRUG

Germinal

DLF SEEDS & SCIENCE

dairygold
Golden Valleys, Growing Naturally

KERRY AGRIBUSINESS

glanbia

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Collaborations

- UCC (Astrid Wingler)
- UCD (Tom Boland, Karina Pierce)
- AFBNI (Trevor Gilliland)
- WIT (Siobhan Walsh)
- INRA (Luc Delaby, Rene Baumont)
- Wageningen University (Agnes Van Der Poel, Imke de Boer, Eddie Bokkers)
- Cornell University (Mike Van Amburg)
- Dairy NZ (David Chapman, Kevin MacDonald, John Roche)
- USDA (Mike Caslor)
- DPI (Joe Jacobs, Bill Montgomery, Bill Wales)
- Young department, dynamic, seek to build collaborations across disciplines

INRA

afbi Agri-Food and Biosciences Institute

UCD DUBLIN

CORNELL UNIVERSITY FOUNDED A.D. 1865

USDA

Waterford Institute of Technology

WAGENINGEN UR For quality of life

UCC Coláiste na hOllscoile Corcaigh, Éire University College Cork, Ireland

DairyNZ

VICTORIA State Government | Economic Development, Jobs, Transport and Resources

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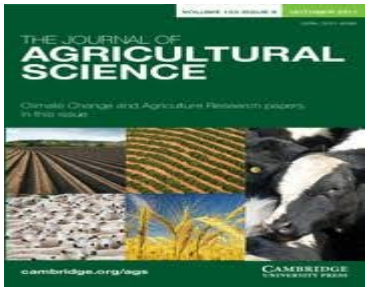
Scientific Publications

Grassland Science	2012	2013	2014	2015	2016
Total Publications	41	40	38	43	50
Publications / FTE	5.4	5.3	5	5.7	6.6
Average Impact Factor	2.02	1.95	1.99	2.30	2.39



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Future and challenges

- Ensure grass system sustainability is well quantified from nitrogen efficiency, GHG emissions and water quality
- Refine grassland management practises
- Increase grass utilisation across enterprises - esp Beef
- Grass/clover nutritive value and role of other species (plantain, chicory, red clover)
- Overcome the variation in clover contribution to grassland systems
- Develop on farm grass/clover evaluations
- Develop PastureBase Ireland - predictive grass growth, quality, benchmarks
- New skills in big data and integration of new grassland precision tools

GOAL: to be the leading grassland research department nationally and internationally

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