

Grasses for the Future Conference

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Rising labour and associated housing costs are forcing farmers to reanalyse their production systems in order to remain competitive. Farmers are once again looking at grass to reduce production costs and remain competitive.

In order to address farmers' requirements from grass in Ireland, Teagasc in association with the DAFF, hosted a two day conference to bring together the stakeholders within the grassland industry, including farmers, breeders, advisors, merchants, evaluators and scientists.

DAY 1: GRASSES FOR THE FUTURE CONFERENCE

The objective of day 1 of the conference was to examine grass breeding, variety evaluation and the opportunities for speeding up the breeding process by using new technology. Day 1 was split into four sessions, with leading international researchers and breeders delivering scientific papers on their specified field.

SESSION 1: THE IDEAL GRASS FOR FUTURE LIVESTOCK PRODUCTION SYSTEMS

SESSION 2: BREEDING GRASSES FOR THE FUTURE

SESSION 3: IDENTIFYING THE BEST GRASSES

SESSION 4: INDUSTRY UPTAKE OF GRASS BREEDING PROGRESS

There were three papers which were of particular interest to me, the first paper was:

1. **The requirement's of future grass based ruminant production systems** by Michael O'Donovan, Teagasc.

The recommendations of this paper were focused towards spring calving grass based dairy production.

- Michael's paper suggested that seasonal growth is far more important than annual growth. It is suggested that the ability for grass to grow at colder temperatures and provide growth at the shoulders of the season would be extremely beneficial as it would reduce the need for feeding conserved forage and expensive concentrates to the dairy herd. Michael viewed this attribute as the most important, with regards to economics.
- The paper also suggested there was little requirement for high growth rates mid season, on the milking platform, which has to be removed for conservation.
- Mid season digestibility was viewed as extremely important. The ability to maintain a high leaf to stem ratio for longer in the season is essential for optimum production from grass.



If the flowering behaviour of a cultivar could be manipulated it would have significant benefit for milk solid production. In conjunction with a cultivar's ability to grow at colder temperatures ($<8^{\circ}\text{C}$), the paper highlighted the need for cultivars to improve in canopy structure that could withstand higher levels of poaching without production losses and would persist in the sward for a longer period of time.

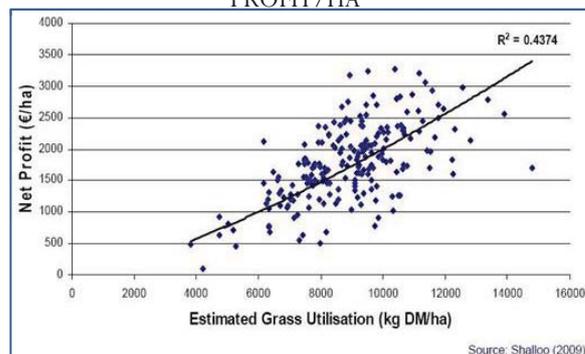


Research from Teagasc highlighted the competitive advantage of a grass based system on the world market. Research undertaken by Teagasc clearly illustrates a correlation between grass utilisation and farm profits. The graph opposite illustrates this relationship.

From the graph it is clear to see that a rise in grass utilisation from 10,000kgDM/ha to 14,000kg/DW/Ha can improve profitability by £1,000/ha, however to achieve utilisation of 14,000 kg/ha/DM per year, the farm would need to be growing 17,500t/ha/DM, a phenomenal quantity of grass even if the cows were utilising 80% of pasture grown.

Moorepark conducted a farm study into profitability from grass production, at Curtins research farm over the past 25 years. Research focused on increased stocking rate to improve grass utilisation. As the study illustrates pasture

RELATIONSHIP BETWEEN GRASS UTILISATION AND PROFIT/HA



production increased by 25% (3.2t/ha/DM) from 2005-2009, resulting in a 1.6t/DM/ha grass surplus. Milk solids fell by 70 kg cow as a result of a higher level of maintenance per ha (more cows on the same parcel of land). During this period fertiliser and concentrate was reduced by 54kg/cow and 175kg/ha respectively.

- Michael's paper suggested that increasing stocking rate by one 1LSU per ha, could increase milk production by 20% per ha. Based on a spring block calving grass based herd (MrCarthy et al, 2010).
- Moorepark's target for the study is to increase the stocking rate to 3.3cow/ha producing 18t/DM/ha and achieving 90% utilisation. To capture the maximum benefit the farm would need to ensure feed demand matches grass supply.

TABLE 2: A comparison of the dairy production systems from 1984 to 2009 at Curtins Farm, Teagasc Moorepark

Year	1984	2001-2005	2007	2009	Target
Stocking rate (LU/ha)	2.91	2.5	2.65	2.82	3.3
Concentrate (kg/cow)	725	350	190	175	300
Fertilizer (kg N/ha)	423	300	305	246	250
Grass growth (t DM/ha/yr)	12.8	12.5	14.7	15.7	18.0
Surplus feed (t DM/ha)	-	-	1.6	1.8	-
Milk solids (kg/cow)	354	500	478	430	460
Milk solids ((kg/ha)	1029	1,250	1,254	1,220	1,518

2. Developments in plant breeding by Pete Wilkins, IBERS

The focus of this paper was on breeding achievements and the expected developments from perennial ryegrass. Breeding began in the 20th century with the domestication of perennial ryegrass. Initial developments

were forged in leafy and persistent varieties, with the aim to increase digestibility. Mainstream breeding focused on making as much gain as possible from a single breeding cycle. Results for the paper highlighted that in 40 years DM yield has increased by 13%, ground cover by 21% and rust resistance by

Yr. 1	1000 breed crosses
Yr. 2	Seeds from resultant families are bred outdoors in small plots
Yr. 3&4	Large number of individual spaced plants reared from seed are visually evaluated in excess 100,000 plants
Yr. 5	Selected plants are clonally replicated
Yr. 6&7	Clones are allowed to inter cross and progeny families evaluated
Yr. 8-15	Several candidate varieties are produced and evaluated as small plots to identify the best for commercial development

44%. The important point is the time it takes to develop a new variety.

The process of developing a new variety through phenotype selection can take 16 years as illustrated in the table above, at a cost of £500,000 per variety, successful added to the recommended list. With only 1% of the material bred making it past the

breeders' initial selection process. Genotype selection is now available to breed varieties quicker than is possible with phenotype selection, enabling desired traits to be available more quickly. Bringing farmers and breeders together is of vital importance if breeders are to select for the traits farmers will need in the years to come.

3. Capturing the economic benefit of *Lolium perenne* cultivar performance by M McEvoy, Teagasc.

Moorepark has been involved in designing an economic value for individual cultivars and the third paper looked at this economic index. An economic value could then be used as a development tool for grass selection, using a similar principle to bull selection.

ensiling. Persistency is classified as extremely important within the index, varieties which are uncompetitive are heavily penalised. Economic values were applied to experimental production data, collected from 3 years of perennial ryegrass study plots. The economic

Economic values (£ per ha/year) for DM yield, quality, persistency and silage yield												
	Production (per kg DM/ha)			Quantity (per unit decrease in DM yield)						Persistency	Silage	
	Spring	Mid Season	Autumn	April	May	June	July	August	September		1 st Cut	2 nd Cut
Base value	£0.13	£0.025	£0.86	-£0.0008	-£0.008	-£0.007	-£0.0075	-£0.006	-£0.005	-£4.16	£0.027	£0.02

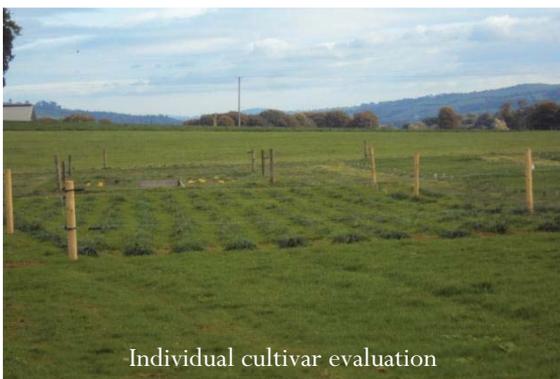
Source :M Mc Evoy et al, 2010

Traits are selected based on their ability to effect profitability on a grass based system, these traits are illustrated in the table below with their economic value. Traits were identified which have the greatest potential to influence the profitability of a farming system. Autumn growth is worth far more to the farm than that of summer, therefore it is given a higher value. Varieties which provide high growth between April-September are given a negative value, as the excess grass can not be utilised by the grazing cow and requires

value of individual varieties was then calculated. Sub indexes were used to create an index by means of a correction factor relating to grazing intensity. The aim of the total economic index is to enable varieties to be ranked based on their economic contribution to the farming system. A variety can be selected based on a grazing or silage system, matching attributes to requirements.

Although the economic index is a step in the right direction it is believed economic values should be altered based on geographic location which can dramatically effect the variety's ability to perform, based on growing conditions.

The general consensus of the delegates was that a larger data pool, over a greater number of seasons was required within the sub indexes before nominal values are presented to the market. Shareholders were worried farmers may select a variety based on its economic index as a single factor in isolation.



Individual cultivar evaluation

DAY 2 STAKEHOLDERS DISCUSSION WORKSHOP & TOUR OF MOOREPARK GRASSLAND RESEARCH

The morning of the second day was focused around a workshop forum, at which stakeholders, from farmers to researchers, were asked to prioritise the grassland traits required for the future.

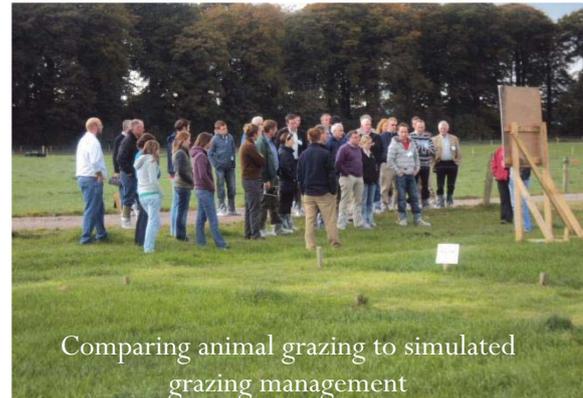
The general consensus agreed with Michael O'Dullivan's paper, which highlighted the importance for grass to grow at lower temperatures as the most important attribute. Developing varieties which are also able to produce a dense sward and withstand poaching to a higher degree during wet weather is vital if winter grass growth was to be utilised.

In addition to growth habitats and structure, nutrient efficiency was classified as integral both for farm profitability but also for environmental implications and future restrictions.

Stakeholders were asked to highlight areas for improvement in the breeding evaluation process.

It was suggested the testing system needed to be updated, adapting the cutting regime to

simulate the situation on farm, where the grass is grazed down to 3.5cm, increasing the number of cuts per year to match the number of grazing rotations on farm. Farmers believed preferential grazing trials similar to those conducted by Kingshay were a necessity as developing the perfect variety is useless if the cows will not eat it! All shareholders agreed it was important breeders were in touch with farmers' requirements and for farmers to understand the limitations of the breeding cycle



Comparing animal grazing to simulated grazing management and attribute selection.

DAY 2: TOUR OF MOOREPARK GRASSLAND RESEARCH

The highlight of the conference from my perspective was the afternoon session of the 2nd day, a tour of Moorepark grass trials. This provided an opportunity to visit one of the world leading grassland research centres. They demonstrated projects currently under investigation and practices by which preferential grazing is undertaken and grass scoring procedures.



Introduction to Moorepark grass trials

Unveiled at the conference was a machine capable of identifying and counting perennial ryegrass plants. The idea of the machine is to provide an accurate assessment of the perennial ryegrass percentage in the sward. This will enable farmers to accurately assess their swards and to justify the need for reseeding.



Pasture analysis goes hi tech

In my opinion the Grasses for the Future Conference achieved exactly what it set out to do, providing an opportunity for all the delegates to understand the entire process of plant breeding and thrash out the desired grass traits for the future.

I would like to thank the British Grassland Society for providing me with the opportunity to attend the conference, it was a unique opportunity to be involved in the discussion forums and to visit Teagasc research centre at Moorepark. The information I learnt will no doubt contribute significantly to our work at Kingshay for the foreseeable future.