Grass growth model evaluation to manage grass supply on farm in the south of Ireland

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1 INTRODUCTION

- Increased grass growth key to meeting Food Harvest 2020 targets
- Grass can provide more than 70% of the diet of dairy cows in Ireland
- Grass growth influenced by:
  - meteorological conditions
  - management factors
  - soil type
- Variable grass growth → budgeting challenges
- Models can add to understanding of grass growth
- Grassland management requires improved grass growth predictions

2 OBJECTIVE

To evaluate three existing grass growth models for use in Ireland (Johnson and Thornley, Jouven, Brereton) using measured grass growth data at Teagasc Moorepark over a 5 year period (2005-2009)

3 MATERIALS AND METHODS

- Data
  - Meteorological (2005-2009)
  - Grass growth data (2005-2009)
- Grass growth models
  - Johnson and Thornley (1983), J&T model
  - Jouven *et al*. (2006), J model
  - Brereton et al. (1996), B model
- Accuracy of the models – mean square prediction error (MSPE) which is the sum of three components:
  - mean bias
  - line bias
  - random variation

4 RESULTS

- **The Johnson & Thornley model over predicted grass growth**
- **The Jouven model under predicted grass growth for most of the year, particularly in spring**
- **The Brereton model over predicted grass growth in summer and autumn**

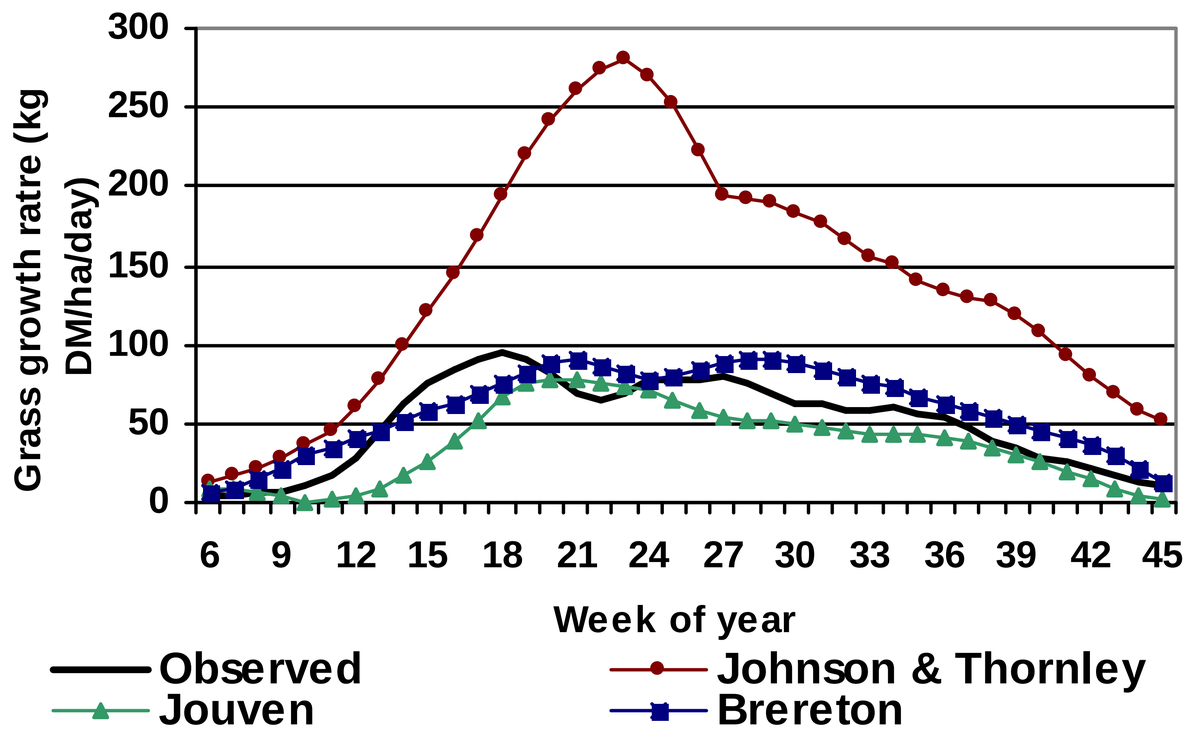

Figure 1 Predicted and measured grass growth data (kg DM/ha/day) for weeks 6 to 45 for the period 2005 to 2009 at Moorepark.

Table 1 Precision of simulation of grass growth by the three models using MSPE (kg DM/ha/day) for 2005–09.

Models	Proportion of MSPE			MSPE	R^2
	Mean bias	Line bias	Random variation		
J&T model	0.488	0.493	0.019	16309	0.66
J model	0.350	0.089	0.560	559	0.66
B model	0.181	0.090	0.730	373	0.70

5 CONCLUSIONS

- Potential models to predict grass growth in Ireland are:
  - Jouven *et al*.
  - Brereton *et al*.
- Some modification of both is required
- Improved prediction of grass growth will allow increased grass utilisation, thus facilitating the achievement of Food Harvest 2020 targets in a sustainable manner

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