

GrassCheck: monitoring and predicting grass production in Northern Ireland

P.D. Barrett¹ and A.S. Laidlaw²

¹Agricultural Research Institute of Northern Ireland, Large Park, Hillsborough, Co. Down, BT26 6DR, UK,

²Department of Agriculture and Rural Development for Northern Ireland, Plant Testing Station, Crossnacreevy, Belfast, BT6 9SH, UK, Email: scott.laidlaw@dardni.gov.uk

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Introduction Grass budgeting is a key management practice on dairy farms to balance grass supply on paddocks with grass demand by the grazing herd. Grass budgets must be pre-emptive to be effective. The uncertainty of grass production and the difficulty in quantifying both current and forecasted rates of growth hamper effective budgeting and paddock management. Grass growth rates are highly variable both in time and space. Therefore, they vary greatly between locations at any given time and also across the season at any given location. Figure 1 shows the pattern of growth rates recorded at the Agricultural Research Institute of Northern Ireland (ARINI) in the two seasons before this project. The GrassCheck project was established in Northern Ireland to quantify current rates of grass growth and grass quality and to predict growth rates for up to 2 weeks in advance. The project will run from 2004 until 2006. This paper outlines the project and reports on its findings after one year.

Methodology A total of 6 sets of perennial ryegrass plots were established at 3 Department of Agriculture and Rural Development for Northern Ireland (DARDNI) sites in Northern Ireland: at ARINI, Hillsborough; Greenmount Campus, Antrim and The Plant Testing Station, Crossnacreevy. Plots, circa 1.5 x 5.0m, were cut 4cm above ground with a motor scythe. A total of 365kg N/ha was applied over the growing season. Each set of plots consisted of 9 plots comprising 3 series of 3 replicates. Only one series was cut/week under a sequential weekly cutting regime. Therefore, to simulate rotational grazing, all plots were given 21 days regrowth. Also, growth rates were predicted for the next 2 weeks using the ARINI GrazeGro growth model (Barrett *et al.*, 2004). Growth rate and grass quality were determined rapidly from the plots. They, plus the 2-week predicted growth, were reported to the farmers in weekly bulletins in the local farming press and on DARDNI websites.

Results Growth rates for 2004 varied considerably across the season and deviated consistently from the 5-year mean growth rate line determined over the 5 years preceding the project. Figure 2 shows the pattern of growth rates for 2004. Accumulated grass production from Mar to Sep 2004 was 15.2% above the mean for the previous 5 years. The GrazeGro growth model provided a reliable indication of future rates of grass growth. Figure 2 also shows predicted growth rates. $R^2=0.78$ for predicted output regressed against observed growth rates until the middle of Sep 2004.

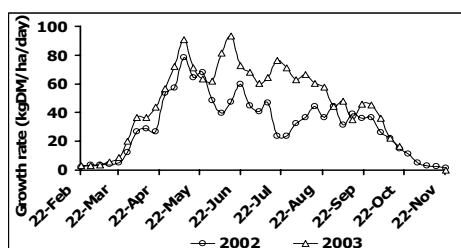


Figure 1 Variation in growth rate observed at ARINI 2002-03

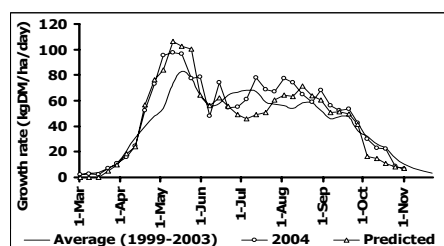


Figure 2 GrassCheck 5-year mean, actual and predicted growth rate for 2004

Conclusion Given the variability of growth, the need for a monitoring programme for grass growth and quality was demonstrated well. Weekly GrassCheck bulletins throughout the season provided accurate and timely indication of growing conditions to farmers and advisors in Northern Ireland. Given the good precision of the GrazeGro model, accurate estimates of predicted growth rates were given to aid in decision-making for grassland management and grass budgeting procedures.

References

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