Dry matter production persistence of perennial ryegrass swards on commercial grassland farms

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Summary

- Stability of pasture dry matter production has a significant impact on farm economic sustainability.
- Results from on-farm evaluation suggest little difference between varieties in terms of persistence in swards up to eight years old.
- Dry matter production was similar between one and 5-8 year old swards for all varieties evaluated.

Introduction

Maximising pasture intake of dairy cows is a key factor in determining profitability on Irish dairy farms. This is due to the low cost of producing pastures in Ireland where the most expensive aspect of pasture production is often reseeding, which is most recently estimated at €1,100/ha by Teagasc. Perennial ryegrass (PRG) is the predominant pasture species used on commercial grassland farms in Ireland. As it is a perennial species PRG should, by definition, produce similar amounts of dry matter (DM) each year where all other factors affecting growth remain optimal.

In recent years, Teagasc researchers have been utilising data from PastureBase Ireland (PBI) to evaluate PRG variety performance on commercial farms. This ongoing evaluation has been operational for almost a decade and many paddocks on the trial have aged to eight years. This has allowed for the evaluation of varieties in a state of 'permanent pasture' (defined as pasture older than five years) on commercial grassland farms; such work is facilitated by the use of PBI and has not previously been possible. Up to now variety persistence values were derived from ground score measurements of Recommended List (RL) plots; however, measuring the actual DM production of varieties as they age is a more accurate method of assessing persistence. The persistence of a given variety has two major impacts at farm level: (1) where varieties are not persistent there will be an increased need for pasture reseeding to maintain adequate levels of forage production and (2) where varieties are persistent the cumulative difference in DM production between high and low yielding varieties will increase with each year post sowing.

Commercial farm research trial

Monocultures of eight varieties of PRG were sown in 649 paddocks across 101 Irish grassland farms between 2012 and 2021. These paddocks were treated similarly to all other paddocks on-farm in terms of grazing, fertilisation and weed control practices. Growth data for each paddock was taken from PBI; farmers on the trial were required to complete a minimum of 30 farm walks per year and where this standard was not met paddocks were excluded from the dataset for that year.

The eight varieties (along with the associated ploidy and heading date in parenthesis) sown as part of this work were: AberChoice (D; 9 June), AberGain (T; 4 June), Astonenergy (T; 2 June), Drumbo (D; 7 June), Kintyre (T; 6 June), Majestic (D; 1 June), Twymax (T; 7 June) and Tyrella (D; 4 June). These varieties were chosen as they were all RL varieties that provided a fair representation of the varieties sown on progressive grassland farms in Ireland from 2012–2021.

Results

Dry matter production was associated with sward age (Figure 1) but there was little change in the differences in DM production between varieties as they aged. One year old swards produced 955 kg DM/ha more than the average of 2-4 year old swards; however, there was no difference in DM production between one and 5-8 year old swards (Figure 1). Variety affected total DM production; AberGain had the highest DM production (15,376 kg DM/ha per year), growing 1,389 kg DM/ha per year more than the lowest producing variety.

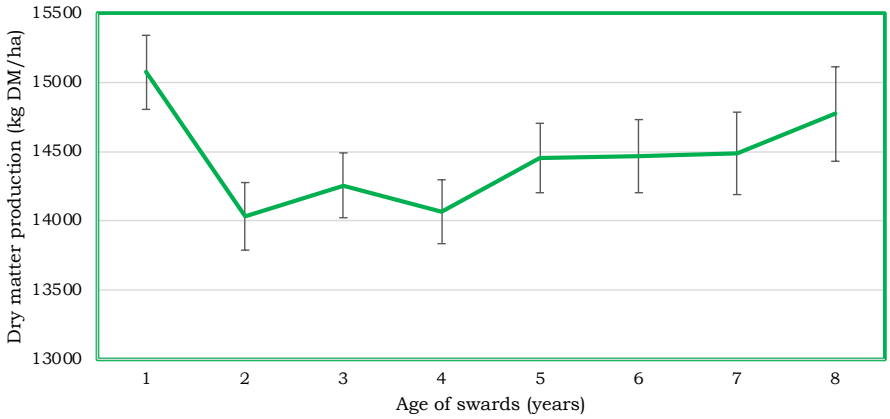

Figure 1. *Mean total dry matter production (kg DM/ha) of eight perennial ryegrass varieties (error bars represent standard error) from ages 1-8*

These results underline the persistence of PRG varieties on the Irish RL when they are utilised on well managed grassland farms. The pattern of DM production over time was similar for all varieties in the current trial as they aged to eight years old. This work emphasises the importance of choosing high performing RL varieties when reseeding paddocks as the differences between varieties will persist over time and can equate to an extra grazing per paddock per year. These results imply that the value of reseeding a paddock with improved PRG varieties may be underestimated when all other factors affecting grass growth (soil nutrient status, climate, grazing management) are optimised. This on-farm trial will continue indefinitely in order to assess the ongoing persistency of these varieties as the age to 10 years and beyond.

Conclusions

There is little difference between PRG varieties in terms of DM persistence on commercial grassland farms in Ireland up to eight years post sowing; selection of PRG varieties at reseeding will affect DM production throughout this period.

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