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Long term dry matter production of *Lolium perenne* as influenced by management and cultivar.

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**Introduction**

Long term dry matter (DM) yield is important to ensure sown pastures remain productive long after the initial years of establishment. The establishment of a cultivar with proven DM yield longevity delays the need for the costly reseeding process (Wilkins and Humphreys, 2003) but the effect of management on the cultivar should be taken into consideration (Reed, 1994). The objective of this study was to evaluate the effect of simulated grazing and conservation managements under cutting on the DM yield performance of perennial ryegrass cultivars.

**Material and Methods**

One hundred and forty four plots (5 × 1.5 m) were sown with twelve cultivars of perennial ryegrass in autumn 2006 in randomised block design. Four diploid cultivars were used with the following heading dates: Alto (15 May), Arrow (22 May), Portrush (14 June) and Tyrella (8 June). Eight tetraploids were used: Bealey (22 May), Dunloy (8 June), Dunluce (31 May), Glencar (6 June), Greengold (31 May), Lismore (28 May), Malone (22 May) and Navan (9 June). Four cutting protocols were imposed on the plots representing simulated grazing (SG); 1 cut silage (1C); 2 cut silage (2C) and 3 cut silage (3C). Each cultivar was replicated three times. The SG consisted of 10 defoliations, beginning on the 20th March and then every three to four weeks until final harvest in late October. The 1C consisted of 7 defoliations beginning on the 1st February, with the 2nd taken 12 weeks later and every 3 to 4 weeks until final harvest in late October. The 2C consisted of 6 defoliations beginning on the 1st April, with 2nd and 3rd cuts taken after 7 and 6 week intervals and the final 3 cuts taken after at intervals of 4, 5, and 6 weeks respectively. The 3C consisted of 5 defoliations with the first taken on 25th May, the 2nd and 3rd taken after 6 week intervals and the final two cuts on 1st Sept and 1st Oct. Plots were harvested with a motor Etesia to 4 cm across 5 full growing seasons, 2007 to 2011, inclusive. All mown herbage from each plot was collected and weighed; 0.1 kg sample was dried for 12h at 80°C to determine dry matter percentage of the sample. Data was analysed using Proc Mixed in SAS (SAS, 2004) with year, block, management, cultivar and their interactions tested for in the model.

**Results and Discussions**

Year, management and variety (P<0.001) had a significant effect on DM production. There was a significant (P<0.001) interaction between Year × Variety, Year × Management and Management × Variety on DM production. Figure 1 shows the DM production of 12 cultivars for two managements, SG and 3C – the two most extreme managements. Estimated DM yield for SG, 1C, 2C and 3C managements was 60.64 (SE=.28), 67.34 (SE=.24), 73.13 (SE=.44) and 71.43 (SE=.42) t/5 years, respectively. It was evident that each cultivar’s performance was unique depending on management protocol applied. Bealey and Tyrella ranked highest in SG dropping to 6th and 12th, respectively under 3C management. Malone and Alto ranked 8th and 11th under SG management rising to 1st and 2nd in 3C. This change in rank of cultivars indicates that cultivar DM yield is strongly influenced by management and cultivar choice must closely relate to the conditions under which it will be grown and utilised.

**Conclusions**

Management did influence the long term DM production of each cultivar uniquely, causing a large number of cultivars to re-rank between simulated grazing and conservation managements. Clearly each management has an optimum cultivar to maximise DM production, with some cultivars suited to grazing systems while others are suited to intensive silage systems. Choice of cultivar should be based on intended management to maximise long term dry matter production.

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**Reference**


![Fig 1: Cumulative DM yield for 2 Managements across 5 years](image-url)