

Seasonal perennial ryegrass nutritive characteristics: south-west Victoria

Understanding seasonal supply of nutrients from perennial ryegrass can aid in the formulation of optimal diets for grazing dairy cows.

The nutritive characteristics of perennial ryegrass (PRG) vary between seasons and influence the best choice of supplements to feed to dairy cows. Farmers are already well aware of changes in key components such as dry matter, crude protein and metabolisable energy content throughout the year. However, a better understanding of the seasonal variation in pasture quality can provide farmers with the knowledge to formulate tailored rations for grazing dairy cows to optimise milk production.

SEASONAL CHANGES IN PASTURE QUALITY

Differences in pasture quality and quantity are affected by both environmental conditions and on farm management practices. South-west Victorian dairy farms are mainly dryland farms, with some farmers having access to irrigation water. Average rainfall is moderate to high, and is generally lower compared with Gippsland.

PERENNIAL RYEGRASS CULTIVARS

There were 18 cultivars of PRG analysed for their nutritive characteristics over five growth periods in south-west Victoria, including trial cultivars. Cultivars included: Abermagic AR1, Alto AR37, Arrow AR1, Avalon AR1, Banquet II Endo5, Base AR37, Bealey NEA2, Bronsyn AR1, Endure AR1, Extreme AR1, Halo AR37, Impact AR1, One50 AR37, Trojan NEA2, Victoria SE and three trial cultivars. These cultivars differed in ploidy, maturity date, and the endophyte that they contained.

PRG NUTRITIVE CHARACTERISTICS

The table on the following page gives a brief overview of the difference in nutritive characteristics between season.

Early spring

Early spring pasture in south-west Victoria was high in crude protein. Calcium and phosphorus levels were also high, while potassium and sodium levels were low.

Late spring

As pasture matured, crude protein concentrations declined, while ADF and NDF concentrations increased along with lignin concentrations. Phosphorus levels declined, while potassium concentrations greatly increased. Sulphur levels drastically decreased from those seen in early spring.

Summer

Summer pasture had the lowest metabolisable energy and crude protein content of all seasons in south-west Victoria, while fibre concentrations were at their peak. High lignin concentrations indicate the pasture is flowering compared with vegetative autumn pasture. Calcium, potassium and sulphur concentrations increased in summer.

Autumn

Pasture in autumn, harvested after the autumn break, was higher in protein and lower in fibre and lignin compared with summer pasture. Fat and carbohydrate levels did not differ greatly. All minerals increased in concentration in autumn pasture.

Winter

Winter pasture had the greatest crude protein content, yet had the lowest fibre concentrations. Lignin concentration was also at its lowest, while the fat levels were the highest of all seasons. Concentrations of phosphorus, potassium and sulphur increased, while all other minerals decreased in concentration.

IMPLICATIONS FOR FARMERS

A greater understanding of the nutritive characteristics of PRG cultivars in south-west Victoria during each season can allow farmers to optimise the diet of their cows to match the supply of nutrients from supplementary concentrates with that from the pasture grazed by their cows.

The table below describes the nutritive characteristics of all cultivars averaged for each season, as it is more practical to formulate rations this way, and not for individual paddocks where the PRG cultivar is different. Therefore, farmers can focus on seasonal changes, however considerations need to be made for paddocks containing species other than PRG.

FURTHER INFORMATION

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ACCESSIBILITY

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Figure 1. Perennial pasture at the trial site in Terang during autumn

Table 1. Summary of the south-west Victoria perennial ryegrass nutritive characteristics during early season

Season	ME	CP%	ADF%	NDF%	Lignin	NSC	Fat	Ca	P	Mg	K	S	Na	Cl
Early spring	11.1	18.3	25.3	44.3	1.9	10.5	4.7	0.45	0.39	0.29	3.34	0.34	0.48	1.95
Late spring	10.4	12.8	28.6	53.4	3.5	11.6	3.0	0.38	0.19	0.32	1.46	0.23	0.51	1.38
Summer	9.9	14.9	30.6	55.6	4.6	8.0	3.6	0.45	0.17	0.26	1.79	0.27	0.39	1.32
Autumn	10.7	24.1	24.0	41.6	2.5	8.9	3.8	0.36	0.32	0.31	3.26	0.40	0.62	1.75
Winter	11.5	30.9	21.6	37.2	1.7	10.5	5.0	0.33	0.48	0.26	4.20	0.52	0.48	1.42

CP = crude protein, RDP = rumen degradable protein, ADF = acid detergent fibre, NDF = neutral detergent fibre, and NSC = non-structural carbohydrates.