

Seasonal perennial ryegrass nutritive characteristics: Gippsland

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 choice of supplementary grain farmers feed to their dairy herd. Farmers are already well aware of changes in key components such as dry matter, crude protein and metabolisable energy content across the four seasons. However, a better understanding of the seasonal changes in pasture quality can provide farmers with the knowledge to formulate tailored rations for grazing dairy cows during each season to optimise milk production.

SEASONAL CHANGES IN PASTURE QUALITY

Pasture quality and quantity are affected by both environmental conditions and on farm management practices. Compared with the other dairying regions in Victoria, Gippsland has a high annual rainfall and is typically a dryland farming region. Samples were collected in Gippsland over five growth periods, and analysed for nutritive characteristics.

PERENNIAL RYEGRASS CULTIVARS

Seven cultivars of PRG were analysed for their nutritive characteristics. These were: Arrow AR1, Banquet II Endo5, Bealey NEA2, Halo AR37, One50 AR37, Trojan NEA2 and Victoria SE (commonly known as Vic Rye). These cultivars differed in ploidy, maturity date, and the endophyte that they contained.

PRG NUTRITIVE CHARACTERISTICS

The table on the following page gives a summary of the differences in nutritive characteristics between season.

Early spring

Early spring pasture is in its vegetative state, and is characterised by high protein concentrations with low ADF and NDF concentrations. Phosphorus and potassium levels are high in early spring pasture.

Late spring

Perennial ryegrass in late spring had lower protein levels, with less of this protein degraded in the rumen (RDP). Metabolisable energy was also lowest in this season. Concentrations of ADF and NDF increased, as did lignin concentration as the plant transitioned into the reproductive stage. Levels of magnesium and sodium increased.

Summer

Lignin concentrations increased indicating a reduction in digestibility. Crude protein concentrations remained low, while ADF and NDF concentrations remained high. Sulphur and chlorine concentrations were highest in summer, while phosphorus levels were at their lowest for the year.

Autumn

Pasture harvested after the autumn break had the highest CP content of any season. Concentrations of fat were also at their highest, while lignin, sugar and carbohydrate concentrations were declining. Levels of phosphorus, potassium and sodium increased from summer levels.

Winter

Protein levels were lower in winter compared with autumn values, while carbohydrate, sugar and starch concentrations increased. Fat concentrations declined, but there were limited differences in the mineral concentrations relative to autumn.

IMPLICATIONS FOR FARMERS

Gippsland farmers can use this information to formulate optimal diets for grazing dairy cows in their region, to complement the nutrients from grazed pasture with appropriate supplementary grain in the dairy.

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

Meaghan Douglas

Phone: (03) 5624 2241

Email: meaghan.douglas@ecodev.vic.gov.au

ACCESSIBILITY

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Table 1. Summary of the nutritive characteristics of perennial ryegrass pasture during each season in Gippsland

Season	ME	CP%	ADF%	NDF%	Lignin	NSC	Fat	Ca	P	Mg	K	S	Na	Cl
Early spring	11.4	20.0	24.2	41.5	1.8	12.3	3.6	0.61	0.44	0.20	3.27	0.35	0.22	1.27
Late spring	10.3	11.9	29.1	50.5	3.3	9.1	2.6	0.60	0.21	0.27	1.88	0.28	0.21	1.22
Summer	10.7	15.0	25.9	45.7	4.4	10.1	4.4	0.71	0.16	0.27	2.25	0.34	0.20	1.49
Autumn	11.2	29.9	23.1	40.3	2.1	7.6	5.3	0.53	0.44	0.28	4.08	0.41	0.42	1.20
Winter	11.7	23.8	23.2	38.0	1.6	10.6	4.8	0.54	0.47	0.22	4.07	0.44	0.40	1.27

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

a)



b)



Figure 1. Comparisons between cultivars Trojan NEA2 (left) and Vic Rye (right) in a) early spring, b) summer, c) autumn and d) winter

c)



d)

