

Effect of species, season and management practice on the nutritive value of fodder tree leaves

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A better understanding of tree pruning and pollarding on the fodder quality of woody leaves may be helpful for the conception and the management of livestock agroforestry systems (Dufour *et al.*, 2018; Emile *et al.*, 2017). In this study we compared the nutritive value of pollard and high stem tree leaves across seasons in three species (common ash, white mulberry and paulownia). Leaves were collected on high stem and winter pollard trees grown on the same site. All samples were analysed for 1/ ash, crude protein (CP), and fibre (NDF) contents, and 2/ enzymatic digestibility (Aufrère, 1982, adapted to the DAISY Incubator). The three-way ANOVA shows a significant effect of species, season and management on all the variables. Common ash and white mulberry exhibit a better fodder quality than Paulownia: higher leaves CP content, digestibility and lower NDF content. Leaves ash content was 50% and 30% higher for white mulberry than for common ash and paulownia, respectively. There was a strong interaction species by management for all variables but particularly high for CP and ash content. Leaves CP content decreased from June to October (146 to 131 g kg⁻¹ DM). In conclusion, the three species have a sufficient digestibility and CP content to be including in the diet of ruminants whatever the season and the tree management.

		n	Dry matter (g kg ⁻¹)		Crude protein (g kg ⁻¹ DM)		NDF (g kg ⁻¹ DM)		Enzymatic digestibility (%)		Ash (g kg ⁻¹ DM)	
			H.st.	Pollard	H.st.	Pollard	H.st.	Pollard	H.st.	Pollard	H.st.	Pollard
Common ash	June	7	299	278	167	197	366	382	73.0	72.4	75	58
	August	7	400	359	138	184	352	375	70.8	70.2	88	82
	October	7	402	391	118	147	300	319	73.8	73.3	92	82
White mulberry	June	3	225	268	219	153	258	242	84.6	90.1	123	123
	August	3	322	324	151	121	266	259	83.2	84.3	156	191
	October	3	346	373	164	114	257	286	82.6	82.3	164	196
Paulownia	June	3	283	201	152	196	481	450	57.7	69.3	80	101
	August	3	267	228	134	149	483	469	53.5	61.6	88	113
	October	3	318	260	127	117	440	448	57.8	60.6	81	116
LSD			10.8		6.9		9.0		13.8		4.9	
Three-way ANOVA												
Mgt	DF=1		F= 9.3**		F=6.5*		F=1.9		F=4.6*		F=2.8+	
Sp.	2		62.1***		2.7*		275.7***		173.8***		199.9***	
Season	2		65.6***		42.3***		15.4***		4.9*		27.4***	
Sp. x Mgt	2		8.3***		28.5***		2.3+		6.7**		15.3***	
Mgt x Season	2		0.5		1.6		1.1		1.1		2.2	
Sp. x Season	4		4.5**		1.7		6.5***		1.7		5.9***	
Sp. x Mgt x Season	4		0.8		1.7		0.5		0.8		0.7	

Sp : species ; Mgt : management ; H.st. : High stem; +P<0.10, *P<0.05, **P<0.01, ***P<0.001; LSD : Least significant difference

Table 1 : Effect of tree species, season and management (pollard vs high stem) on leaves dry matter, crude protein, neutral detergent fibre (NDF) and ash content and enzymatic digestibility.

Keywords: nutritive value, fodder trees, pollard trees, agroforestry, ruminants.

References:

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