

Relations between some components of feeding value in sown temperate pastures with a range of water inputs

H Landi ¹, E Riveros ², MH Wade ¹, D Dalla Valle ¹

¹Facultad de Ciencias Veterinarias, UNICEN, Tandil (7000), Argentina ; ²Universidad de Chile, Facultad de Ciencias Agrarias y Forestales, Casilla 1004, Santiago de Chile

At two sites in Chile (40.9° S, 73.1° W) and Argentina (37.7° S, 58.3° W), five levels of water input were applied to three pastures, causing variation in yield. The objective of this study was to identify, for each pasture, the components of feeding value which were most strongly related to (A) the *in vitro* digestibility of the harvested pasture and (B) the yield of digestible material. The pastures in Chile were : old pastures P₁ and P₂, sown previously, both with *Lolium perenne* and *Trifolium repens*, but invaded by other species, particularly *Holcus* and *Bromus* spp. P₁ and P₂ commenced the trial with 50 % and 30 % of sown species, respectively. The Argentine pasture, P₃, was sown 2.5 years before the trial year (1992-3), with principally *L. perenne*, *Dactylis glomerata*, *Bromus catharticus* and *Trifolium pratense* and with a low level of invasion by other species. The levels of water input to plots of 1.8 x 1.8 m were 17, 32, 59, 70 and 113 % of pan evaporation, applied by means of irrigation and protection from rain as appropriate, and they were cut approximately every 30 days during 110 days in spring and summer. The quality components to be related to A and B above were (among others less important) : neutral detergent fibre (NDF), crude protein (CP), grass leaf lamina (GL), grass stem (GS), dead

material (DD) and legume (L), expressed as either % DM or kg/ha. Total pasture production varied between 3914 and 7065 kg/ha in P₁, 3196 and 5963 kg/ha in P₂ and between 3261 and 6470 kg/ha in P₃, over the range of water inputs. Ranges of mean values were 57 to 65 % DMD, 16 to 20 % CP and 59 to 47 % NDF in the different pastures and treatments.

The principal quality and yield component variables which explain the variation in either the % DMD (A in Table), or kg DMD/ha (B in Table), are presented as simple correlations. There were no similarities between the different swards in terms of which quality component variables were related to % DMD : for example, in P₁ % CP was the most closely related, while in P₂ it was kg DM/ha. Conversely, for kg DMD/ha in all three swards, it was yields of DM, CP and NDF/ha, which were most closely related.

These results indicate that, for the different water input regimes, the principal determinant of the yield of digestible and other nutrient components was the DM production in all pastures (B in Table), while the variation of % DDM showed no such between-site similarities (A in Table).

Selected variables (r^2 ; $P > 0.01$; $x P > 0.05$)

A	% CP	% NDF	% DD	kg DM/ha	% L	% GS
P ₁	0.818	-0.510	-0.490	0.342*	0.337*	
P ₂	0.381	-0.313	-0.730	0.788	0.560	-0.41
P ₃		0.422	-0.477			
B	kgDM/ha	kgCP/ha	kgNDF/ha	kgGL/ha	kgGS/ha	kgL/ha
P ₁	0.976	0.965	0.930	0.863	0.764	0.580
P ₂	0.985	0.969	0.733	0.680	0.680	
P ₃	0.987	0.967	0.982	0.818	0.864	