An agronomic evaluation of grazing maize combined with companion crops for sheep in northwestern KwaZulu-Natal, South Africa

C.S. Dannhauser[1] and E.A. van Zyl[2]
[1]School of Agriculture & Environmental Science, University of the North, Private Bag X1106, Sovenga, 0727, South Africa, Email: chrisd@unorth.ac.za, [2]Dundee Research Station, PO Box 626, Dundee, 3000 South Africa

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Introduction Northwestern KwaZulu-Natal (KZN), in South Africa, is well known for its sheep production from natural rangeland in summer (October to May). During winter however, the nutritional value of the rangeland cannot maintain young growing sheep or pregnant and lactating ewes. With this in mind Lyle (1991) suggested the use of planted pastures for the winter. Crichton, Gertenbach & Henning (1998) and Esterhuizen & Niemand (1989) suggested maize crop residues for both cattle and sheep during winter, whereas Moore (1997) evaluated grazing maize (not harvested) for this purpose. He found that the protein content of the crop was inadequate and for this reason, protein rich companion crops were evaluated in this study.

Materials and methods Maize was intercropped with 14 different crops for three consecutive seasons, on the Dundee Research Station, Dundee, KZN, South Africa. Ten of the crops are given in Table 1 (see the conclusions for the others). Yellow maize was planted in blocks of 60m x 40m in a tramline layout. Rows alternated with a spacing of 90cm and 270cm. The companion crops were planted by hand between the maize rows on two different planting dates: PD1 during late January and PD2 during late February. A randomised plot design with two replications was used. The first season was used for technique evaluation and in the next two seasons maize grain yield, total dry matter (DM) production of companion crops and nutritional values were measured.

Results The rainfall for the three different seasons (July–June) was 575, 620 and 964 mm respectively (long-term average is 782.9mm). In the second season the maize grain production amounted to 3.9t/ha and in the third season to 4.6t/ha. The DM production of the companion crops and their nutritional value are given in Table 1.

Table 1 The average DM production (t/ha) and nutritional value of the companion crops

Companion crop	DM Production (t/ha)				Nutritional value
	Season 2		Season 3		
	PD 1	PD2	PD 1	PD2	CP (%)
Raphanus sativus	4.40a	1.74 bc	2.18a	1.20 b	20.16
Avena sativa	3.03 b	3.27a	0.75 b	1.14 b	4.23
Pennisetum glaucum	2.35 bc	2.49ab	0.41 b	0.63 bc	10.00
Ornithopus sativus	2.39 bc	1.71 bc	1.94a	2.04a	12.23
Vicia dasycarpa	1.65 cde	2.04 bc	1.92a	1.21 b	18.05
Secale cereale	1.95 c	1.11 bc	0.18 b	1.18 b	13.43
Triticale hexaploide	1.48 cde	0.65 bc	0.00 b	0.21 c	15.04
Lablab purpureus	0.72 ef	1.46 bc	0.66 b	0.14 c	14.65
Glycine max	0.17 f	0 c	0.13 b	0.00 c	15.06

Figures with the same roman letters do not differ significantly (P≤0.05) for DM production

Conclusions From a DM production point of view *Ornithopus sativus* and *Raphanus sativus* can be recommended for their high production and high nutritional value (CP). *Vicia dasycarpa* had a high nutritional value. The DM production of *Pennisetum glaucum* and *Avena sativa* was relatively high, but the nutritional value was marginal. *Glycine max* and *Lablab purpureus* showed a high nutritional value, but DM production was low. [*Lolium multiflorum, Sorghum*, *Trifolium vesiculosum, Eragrostis teff* and *Bromus wildenowii* (not mentioned in Table 1) cannot be recommended].

References

Crichton, J. S., W. D. Gertenbach & P. W. van H. Henning (1998). The utilization of maize-crop residues for over wintering livestock (1). Performance of pregnant beef cows as affected by stocking rate. *South African Journal of Animal Science,* 28 (1), 9-15.

Esterhuizen, C.D. & S.D. Niemand (1989). Oesreste van ses kontantgewasse vir die oorwintering van skape. Inligtingsdag, Nooitgedacht-Navorsingstasie, Ermelo. Bl.85-107.

Lyle, A.D. (1991). The use of supplementary licks for sheep on summer and winter Sourveld. Sheep in Natal. Co-ordinated Extension Committee of Natal (5.2.1991). KwaZulu-Natal Department of Agricultural, Private Bag X9059.Pitermaritzburg. 3200.

Moore, A. (1997). Proewe wys lam-afronding op mielies werk. *Landbouweekblad*, 7 Maart 1997:10 -12.