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The production and nutritional composition of forage sorghum cultivars as silage crops

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Introduction Forage sorghum (Sorghum x Sudan grass hybrid) cultivars are palatable , high producing annual summer growing grasses suited for silage production on the duplex soils of the Southern Cape of South Africa . New cultivars are released regularly and the production potential and nutritive value of these cultivars needs to be determined . The aim of the study was to quantify the dry matter production and quality of forage sorghum cultivars for silage production .

Materials and methods The trial was carried out annually during the summer over two years (2004/2005 and 2005/2006) as a small plot trial under irrigation on a Estcourt soil type . Fertiliser was applied to raise phosphorus level to 35 mg kg⁻¹ , potassium level to 80 mg kg⁻¹ and pH (KCL) to 5 .5 . Planting dates were 25th and 24th of November 2004 and 2005 respectively . Each plot received 50 kg N ha⁻¹ and 20 kg K ha⁻¹ with planting . Four weeks after emergence 85 kg N ha⁻¹ and 45 kg K ha⁻¹ were applied as top dressing and this was repeated four weeks later . When the plants reached a dry matter content of between 25 and 30% , each cultivar was cut once at a height of 150 mm , weighed and chopped with a silage chopper to obtain a representative sample . Dry matter (DM) production , crude protein (CP) , *in vitro* organic material digestibility (IVOMD) , metabolisable energy (ME) and NDF of each cultivar were determined .

Results The forage sorghum cultivars Sugargraze , SAC 710 and Hunnigreen produced more than 18 tons of DM ha⁻¹ and are recommended for silage production (Table 1) . There are a number of cultivars that have the ability to produce between 14 and 17 tons of DM ha⁻¹ and can also be considered for silage production . The CP content varied between 7% and 9% and was low . The ME of 6 .9 , 5 .9 and 6 .4 MJ kg⁻¹ DM for Hunnigreen , Sugargraze and SAC 710 respectively were lower than some of the lower producing cultivars nl . Hygro Sil BMR (8 .1 MJ kg⁻¹ DM) and Hygro Sil (7 .8 MJ kg⁻¹ DM) . The CP content (%) , ME (MJ kg⁻¹ DM) and DM production (kg ha⁻¹) of the cultivars influenced the total CP (kg ha⁻¹) and ME (MJ ha⁻¹) . Forage sorghum cultivars differ in production potential .

Table 1 The DM production , DM (%) , CP (%) , total CP , NDF (%) , ME and total ME ha⁻¹ of forage sorghum cultivars for silage production under irrigation , for one season (2005/2006) , at Outeniqua Research Farm .

Cultivars (2005/2006)	DM (ton ha ⁻¹)	DM %	CP (%)	Total CP (kg ha ⁻¹)	NDF (%)	ME (MJ kg ⁻¹ DM)	Total ME (MJ ha ⁻¹)
SAC 710	19 .0 ^a	28 .6	7 .7	1463	64	6 .4	121600
Sugargraze	18 .6 ^{ab}	29 .4	5 .3	987	68	5 .9	109740
Hunnigreen	18 .4 ^{ab}	28 .7	6 .9	1270	62	6 .9	126960
Bulkmaster	16 .6 ^{bc}	30 .6	7 .4	1228	63	6 .1	101260
Superdan 401	16 .1 ^c	29 .7	7 .0	1127	62	6 .1	98210
Super King	15 .4 ^c	28 .1	9 .1	1401	57	6 .1	93940
Revolution BMR	15 .7 ^{cd}	na	5 .7	895	71	5 .2	76440
AGR 3404	14 .7 ^{cd}	28 .5	5 .3	779	69	6 .0	88200
Everlush	14 .7 ^{cd}	28 .3	6 .0	882	73	5 .1	74970
Classic Grazer	14 .5 ^{cde}	28 .1	6 .2	899	70	6 .0	87000
NS 1	13 .0 ^{def}	27 .8	6 .0	780	70	5 .5	71500
Kow Kandy BMR	12 .7 ^{def}	29 .5	7 .9	1003	61	6 .0	76200
Hygro 2 (Wei 7)	12 .4 ^{ef}	29 .8	8 .8	1091	59	6 .8	84320
AGR 6201	12 .0 ^{7f}	28 .0	5 .6	676	56	7 .9	95353
Haymaker	11 .8 ^{3f}	28 .6	7 .9	935	66	6 .0	70800
Silage King	11 .2 ^{0fg}	28 .9	6 .7	750	63	6 .1	68320
Rambo	11 .0 ^{7fg}	28 .3	7 .9	869	68	5 .3	58830
Higro Sil BMR	10 .8 ^{3fg}	28 .9	7 .9	853	54	8 .1	87480
Higro Sil	9 .3 ^{3gh}	27 .5	8 .8	818	51	7 .8	72540
Advanta BMR	8 .3 ^{3h}	29 .3	5 .3	689	64	6 .4	53120
Hygro Graze BMR	7 .9 ^{0h}	28 .8	7 .1	561	59	7 .3	57670

^{abcd} Means with no common superscript differ significantly (P<0 .05) LSD (0 .05)=2 .21 na=not available