

Assessing veld condition in the Kruger National Park using key grass species

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Trollope, W.S.W., A.L.F. Potgieter and N. Zambatis. 1989. Assessing veld condition in the Kruger National Park using key grass species. — *Koedoe* 32 (1): 67-93. Pretoria. ISSN 0075-6458.

Veld condition refers to the condition of the vegetation in relation to some functional characteristic. In the Kruger National Park important functional characteristics are the potential of the veld to produce grass forage and fuel and to resist soil erosion. Consequently a simplified technique based on 18 key grass species was developed for assessing veld condition and monitoring the effects of wild life management practices like veld burning, development of watering points and culling. The technique has been specifically developed for use by wildlife managers and has the ability to indicate the potential of the veld to support bulk grazing animals, to carry a fire and to resist soil erosion.

Key words: Veld condition, key grasses, fire, range condition, monitoring vegetation.

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Introduction

Veld condition refers to the condition of the vegetation in relation to some functional characteristic, normally sustained forage production and resistance of the veld to soil erosion. The development of techniques for assessing veld condition in the Republic of South Africa (Foran, Tainton & Booyesen 1978; Teague, Trollope & Aucamp 1981; Vorster 1982) has proven very valuable for assessing the current condition of the veld and for formulating veld management practices like stocking rate, rotational grazing, rotational resting and veld burning. An assessment of the situation in the Kruger National Park indicated that such a technique would be useful for determining and monitoring the effect of management practices like veld burning, development of watering points and the culling of game on the vegetation. Of particular interest is the effect of these practices on the forage production potential of the grass sward and its resistance to soil erosion. Another factor is the effect of these treatments on the ability of the veld to support a fire as this determines the effectiveness of burning as a veld management practice for example in controlling bush encroachment.

With these objectives in mind a research project was conducted:
To develop an objective method for assessing the potential of veld to produce grass forage and fine fuel for controlled burning;
To identify the key grass species that have the greatest effect on veld condition; and
To develop a simplified but reliable procedure for assessing veld condition for use by wildlife managers.

Development of the technique

The development of the technique for assessing veld condition has been described in detail by Trollope (*in press*) and comprised categorising all the grass species and other herbaceous species (forbs) recorded during past surveys in the Kruger National Park according to their reaction to different intensities of grazing *viz*:

Decreaser species: grass and other herbaceous species which tend to decrease when the veld is under or overutilised;

Increaser I species: grass and other herbaceous species which tend to increase when the veld is underutilised;

Increaser II species: grass and other herbaceous species which tend to increase when the veld is overutilised.

A total of 93 grass species and a composite group of non-grasses called forbs were categorised in this way.

Forage and fuel factors were then estimated for each species on a scale of 0-10 and these factors represent the inherent forage and fuel production potential of the different grass species *i.e.* their genetic potential. In the case of the forage factor it represents the forage utilised by bulk feeders like buffalo *Syncerus caffer*, zebra *Equus burchelli* and elephant *Loxodonta africana* and can be assumed to be also applicable to cattle. The categorisation of the grasses according to grazing intensity and the estimation of the forage and fuel factors were made in conjunction with experienced plant scientists and wildlife managers in the Kruger National Park together with pasture scientists and livestock farmers familiar with the Transvaal bushveld. Similar estimates of forage factors and reaction to grazing intensity of different grass species have been successfully made and used in the different veld types of the eastern Cape and the Ciskei (Trollope 1986) and in the light of this experience it was believed permissible to use this procedure. The shortcomings of subjectively estimating forage and fuel factors were fully recognised but the logistics and available manpower in the Kruger National Park precluded adopting an objective approach to determining these factors. Further justification for this approach was provided by the high degree of agreement between the different estimates of the forage and fuel factors made by the various people that were consulted.

Forage and fuel scores were then calculated for all available grass surveys conducted in the Kruger National Park during the period 1954-1975. The majority of these data comprised grass frequency surveys conducted on the plots of the burning experiment replicated at Pretoriuskop, Skukuza, Satara and Letaba. In all 550 surveys were used and represented data from the major landscape types occurring in the park. The relationships between the resulting grass forage/fuel scores and the percentage frequency of the different grass species were used to determine those species that had the greatest effect on veld condition. This was done with a step-wise multiple regression analysis applying the procedure used by Willis & Trollope (1987) for identifying key grass species in the eastern Cape. The results showed that fourteen grass species together with forbs accounted for more than 90 percent of the variation in the forage and fuel production potential of the veld. The fourteen key grasses were *Bothriochloa radicans*, *Cenchrus ciliaris*, *Digitaria eriantha*, *Eragrostis rigidior*, *Hyperthelia dissoluta*, *Hyparrhenia filipendula*, *Panicum coloratum*, *Panicum maximum*, *Pogonarthria squarrosa*, *Schmidtia pappophoroides*, *Setaria flabellata*, *Setaria incrassata*, *Themeda triandra* and *Tragus berteronianus* (taxa according to Gibbs Russel). Subsequent field experience gained in the Kruger National Park indicated that trends in veld condition could be better estimated by considering the presence and

absence of the following additional grass species viz. *Aristida congesta*, *Enneapogon cenchroides*, *Heteropogon contortus* and *Urochloa mosambicensis*. Consequently these grasses were also considered to be key species. Illustrations and characteristics of all the species are presented in Appendices 1-18.

On the basis of these results a simplified procedure was developed for assessing the condition of the grass sward in the Kruger National Park.

Assessment of veld condition

The first step in assessing veld condition is to sub-divide the survey area under consideration into homogeneous vegetation units (HVU). This comprises demarcating major uniform areas of vegetation within each of the landscapes described by Gertenbach (1983). These will constitute areas where the climate, soil and aspect are similar enough to maintain a homogeneous type of grass sward. The degree to which the above sub-divisions are made will depend upon the size of the survey area and the degree of heterogeneity in the vegetation. Once the HVUs have been identified and delineated an assessment is made of the condition of the veld occurring within each HVU at one or more sample sites. The overall condition of the veld in the survey area is calculated using the proportional contribution of each HVU to the total area.

(i) Location and assessment of sample sites

Sample sites measuring 50 m × 100 m are located in representative areas of each HVU. The number of sample sites will depend upon the size and number of HVUs in the survey area. Suffice it to say that experience and commonsense must influence and determine the final number.

A point quadrat survey of 100 random points (by means of a wheel or step-point method) is conducted to determine the botanical composition of the grass sward. Two rows of 50 points are located down the centre of each half of the sample site and the nearest key grass species to each point is recorded. In the case of non-key grass species these are recorded as "others" and when there is not an herbaceous plant within 25 cm of the point this is recorded as "bare ground". This latter measurement is included to cater for situations where the veld is extremely denuded and the mean distance between tufts far exceeds that which occurs in veld that has a high potential for producing grass forage and/or fuel. The results are expressed as the percentage relative frequency for the key grass species, "others" and "bare ground".

(ii) Calculation of veld condition and trend

The condition of the grass sward is represented by the forage and fuel scores. These are calculated by multiplying the percentage frequency of each key grass species by its respective factor and summing the individual

Table 1
 An example of a score sheet using key grass species in the Kruger National Park
 Veld Condition Assessment — Kruger National Park
 Key Grass Species Grass Forage & Fuel Potential

Landscape: *Acacia welwitschii* Thickets on Karoo Sediments

Sample Site: Gomondwane Bush Date 23/07/87

Category	Species	Frequency %	Forage Score		Fuel Score		
			Factor	Score	Factor	Score	
Decreaser Species	<i>Cenchrus ciliaris</i>		+1,59		+2,16		
	<i>Digitaria eriantha</i>	2	+1,30	3	-0,001	0	
	<i>Panicum coloratum</i>	5	+4,25	21	+2,90	15	
	<i>Panicum maximum</i>	4	+7,40	30	+1,63	7	
	<i>Setaria flabellata</i>		+2,52		+2,71		
	<i>Setaria incrassata</i>		+3,30		+3,30		
	<i>Themeda triandra</i>		+2,29		+3,10		
Decreaser Total		11					
Increaser I Species	<i>Hyparrhenia filipendula</i>		+3,09		+4,92		
	<i>Hyperthelia dissoluta</i>		+1,36		+6,94		
Increaser I Total							
Increaser II Species	<i>Bothriochloa radicans</i>		-0,77		+2,96		
	<i>Eragrostis rigidior</i>		-3,13		-2,76		
	<i>Pogonarthria squarrosa</i>		-1,48		-0,92		
	<i>Schmidtia pappophoroides</i>		+0,07		-1,50		
	Forbs	43	-0,91	-39	-4,09	-176	
	<i>Tragus berteronianus</i>	5	-3,11	-16	-4,72	-24	
	Bare ground		-3,11	268	-4,72	389	
	Additional species:						
	<i>Aristida congesta</i>		—	—	—	—	
	<i>Enneapogon cenchroides</i>		—	—	—	—	
<i>Heteropogon contortus</i>		—	—	—	—		
<i>Urochloa mosambicensis</i>	14	—	—	—	—		
Increaser II Total		62	Total	267	Total	211	
Others		27					
Total		100					

Legend: Decreaser Species — Grass and herbaceous species which decrease when veld is under or overutilised
 Increaser I Species — Grass and herbaceous species which increase when veld is underutilised
 Increaser II Species — Grass and herbaceous species which increase when veld is overutilised

Conclusions

Forage/Fuel Potential

Forage/Fuel Score	Potential	Forage	Fuel
>500	very high		
400-500	high		
300-400	medium	✓	✓
200-300	low		
<200	very low		

Trend

Category	%	Utilisation	tick
Decreaser Species	11	moderate	
Increaser I Species	—	under	✓
Increaser II Species	62	over	

scores to obtain the total forage and fuel scores. The arithmetic procedures are illustrated in an example presented in Table 1.

The trend in the condition of the veld is represented by the relative proportions between the totals of the percentage frequencies for the Decreaser, Increaser I and Increaser II species. These are obtained by summing the individual percentage frequencies of the key grasses in each category as illustrated in Table 1.

Interpretation of veld condition data

As mentioned earlier veld condition data can provide the wildlife manager with information about the effect of veld management practices on the condition of the vegetation and its potential in terms of some functional characteristic such as forage production and resistance to soil erosion.

(i) Forage potential

Preliminary comparative studies in the field indicate that the forage scores can be assessed according to the following categories:

Forage Score	Potential
<200	Very low
200-300	Low
301-400	Medium
401-500	High
>500	Very high

Unfortunately the forage scores cannot be used at this stage to estimate the grazing capacity of the veld because the effect of factors like rainfall, temperature, soil type and bush competition on forage production are unknown. Nevertheless the forage scores could be used to estimate the forage production potential of the different landscapes described by Gertenbach (1983) and the potential of different areas within the same landscape. With experience these data could be conceivably used to set maximum stocking rates for those grazing animal species that require regular culling.

In terms of the veld condition scoresheet illustrated in Table 1 the sample site is scored by ticking the appropriate forage potential class under the section entitled "Conclusions".

(ii) Fuel potential

Preliminary field studies show that the categories used for classifying the forage scores are also applicable to the fuel scores. Therefore, the fuel potential of a sample site is also scored by ticking the appropriate fuel class in the veld condition scoresheet illustrated in Table 1.

Studies have also shown that the fuel score and the previous rainfall occurring over a one to three year period have a highly significant effect on the production of grass fuel ($R=0,87$; $DF= 39$). The relationship is illustrated in Table 2.

Field experience and research (Trollope & Potgieter 1985) in the Kruger National Parks show that fires will not spread readily when the fuel load is less than 2 000 kg/ha and will not generate an intense enough fire to control bush encroachment when the fuel load is less than 4 000 kg/ha. Using these guidelines the data in Table 2 indicate that generally fires will not occur when the fuel score is <250 and high intensity fires will not occur when the fuel score is <400 . These data provide valuable quantitative guidelines for identifying areas with different fire danger ratings and for deciding whether burning can be used for a particular purpose or not in a certain area.

Table 2
Effect of fuel score and rainfall on grass fuel loads in the Kruger National Park expressed in kg/ha

Fuel Score	Rainfall in mm										
	300	500	700	900	1 100	1 300	1 500	1 700	1 900	2 100	2 300
250	691	939	1 187	1 435	1 683	1 931	2 179	2 427	2 675	2 923	3 171
300	979	1 227	1 475	1 723	1 971	2 219	2 467	2 715	2 963	3 211	3 459
350	1 268	1 516	1 764	2 012	2 260	2 508	2 756	3 004	3 252	3 500	3 748
400	1 556	1 804	2 052	2 300	2 548	2 796	3 044	3 292	3 540	3 788	4 036
450	1 845	2 093	2 341	2 589	2 837	3 085	3 333	3 581	3 829	4 077	4 325
500	2 133	2 381	2 629	2 877	3 125	3 373	3 621	3 869	4 117	4 365	4 613
550	2 422	2 670	2 918	3 166	3 414	3 662	3 910	4 158	4 406	4 654	4 903
600	2 710	2 958	3 206	3 454	3 702	3 950	4 198	4 446	4 694	4 942	5 190
650	2 999	3 247	3 495	3 743	3 991	4 239	4 487	4 735	4 983	5 231	5 479
700	3 287	3 535	3 783	4 031	4 279	4 527	4 775	5 023	5 271	5 519	5 767
750	3 576	3 824	4 072	4 320	4 568	4 816	5 064	5 312	5 560	5 808	6 056
800	3 864	4 112	4 360	4 608	4 856	5 104	5 352	5 600	5 848	6 096	6 344

(iii) Trend

Trend refers to the direction of change in veld condition as influenced primarily by the intensity of utilisation of the grass sward by grazing animals. The relative dominance of the Decreaser and Increaser grass species show the trends in veld condition and also indicate the reason for these trends. These data can be used for formulating strategies that will either maintain or alter the condition of the veld depending upon the management objectives. The interpretation of these type of data are illustrated in the scoresheet presented under the heading "Trend" in Table 1. The different trends in veld condition will be dealt with separately.

Decreaser species dominant veld

This is veld that has a high forage and fuel production potential and is indicative of veld that is being moderately utilised by grazing animals. This

veld condition can be maintained if so desired by applying the existing stocking rate of animals and frequency of burning.

Increase I species dominant veld (*underutilised*)

This is veld that has a moderate to low forage production potential but a very high fuel production potential. This condition develops when the veld is underutilised by grazing animals. Observations have shown that this veld condition only develops in the Lowveld Sour Bushveld of Pretoriuskop and the Punda Maria Sandveld landscapes. In the former, grass species like *Hyperthelia dissoluta* and *Hyparrhenia filipendula*, become dominant as a result of undergrazing caused by the grasses becoming unpalatable in the absence of regular burning or with protection from fire. These Increase I grass communities constitute the climatic climax stage in the grassland succession and can only develop in these landscapes because these areas receive a high annual rainfall and are regarded as sourveld. Conversely botanical evidence indicates that the Decreaser stage in the other landscapes is the climatic climax community of the grassland succession and the vegetation cannot develop further because of the lack of moisture caused by a lower annual rainfall.

The most effective means of reversing the succession from the Increase I stage to the Decreaser stage and improving the forage production potential of the veld is to increase the frequency of burning to once every two to three years. This will improve the palatability of the grass sward and therefore its attractiveness to grazing animals. The increased defoliation of the grass by fire will also in itself promote the development of the Decreaser stage. However, these management practices will never be completely successful because this type of vegetation is sourveld and rapidly becomes unpalatable to grazers on reaching maturity. Therefore, it will never be heavily grazed under wildlife conditions and Increase I grass species will always be an important component of the grass sward but need not be the dominant one.

Increase II dominant veld (*overutilised*)

This is veld that has a low forage production potential and generally also a low fuel production potential. For example the *Acacia welwitschii* Thickets landscape at Leeupan is severely overutilised and has both a low forage and fuel production potential. However, there are situations where the Increase II grass species have a high fuel production potential. For example research indicates that *Bothriochloa radicans* increases in the *Sclerocarya birrea*/*Acacia nigrescens* Savanna landscape with overutilisation and while having a low forage production potential, veld in this condition has a very high fuel production potential.

The following veld management practices can be considered if it is deemed necessary to encourage the Decreaser grass species in the Increase II dominant veld. The frequency of burning can be reduced to once every five to six years which will have the effect of decreasing the stocking rate of grazers because the veld will become less palatable and the animals will be attracted to other areas that are more frequently burnt. However, care should be taken not to decrease the frequency of burning to more than once every six years

because bush encroachment could then pose a problem. In situations where extreme overutilisation of the veld precludes the occurrence of fire, artificial watering points could either be closed down or, in the case of windmills, withdrawn on a rotational basis for a year once every three years. Such a rotational resting program has been highly successful in promoting Decreaser grass species elsewhere in the sweetveld areas of South Africa. Areas with permanent water, like perennial rivers and fountains, pose a problem and the only means of reducing the overutilisation of the grazing is by culling or game-capture.

(iv) Resistance of the veld to soil erosion

The resistance of the veld to soil erosion is an important functional characteristic of the grass sward but is very difficult to measure rapidly and accurately. The percentage "bare ground" recorded in the sample site and entered in the scoresheet (see Table 1) provides some indication of the resistance of the veld to soil erosion. However, experience gained in the eastern Cape shows that this functional characteristic is generally highly correlated with its ability to produce forage or fuel. Therefore, veld that has a high forage or fuel score is generally resistant to soil erosion and *vice versa*.

Monitoring veld condition

The reason for monitoring veld condition is to provide the wildlife manager with an objective means of formulating management strategies that will achieve the stated objectives for the management area. An important veld management practice in the Kruger National Park is veld burning and veld condition data could be used to decide what management blocks need to be burnt and the reason for burning these blocks. Additional information on the current grass fuel loads and the condition of the bush component of the vegetation are also necessary for making such decisions. With these factors in mind it is recommended that 30-40 permanent sample sites be identified and assessed in March in those management blocks that are being considered for burning during the late winter/early spring period. In addition a survey with a disc pasture meter as described by Trollope & Potgieter (1986) must be conducted to estimate the grass fuel load. Finally a fixed point photograph must be taken of the the sample site to provide a visual assessment of the condition of the bush. These data can then be used for deciding upon the burning program for that year. This information will also be available for assessing the effect of other management practices and climatic phenomena on the condition of the veld. The development of such a data bank will be of immense value not only to the Kruger National Park but also in the development and refinement of wildlife management in South Africa.

Acknowledgements

We wish to acknowledge and express our appreciation to: Mrs. M. Rochat and Mr. P. Retief, Kruger National Park for the assistance provided in the statistical analysis of the data; Mr. P. Viljoen and Dr. W. P. D. Gertenbach for their advice and assistance; Mrs. M. Whyte, Kruger National Park and Mrs. F. Lees, University of Fort Hare for typing the report; and Mrs. L. Trollope, University of Fort Hare for the collating and preparing the final document. In addition, we thank the various publishers and respective authors for permission to use the illustrations subject to copyright according to Chippindall (1955), Roberts (1973), Chippindall & Crook (1976), Tainton, Bransby & Booysen (1976) and Muller (1984).

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KEY GRASS SPECIES - KRUGER NATIONAL PARK

Aristida congesta
subspecies *barbicollis*



Aristida congesta
subspecies *congesta*



Roberts (1973)

COMMON NAMES:	Spreading Bristlegrass Lossteekgras	Tassel Bristlegrass Aapster Steekgras
GRAZING REACTION:	Increaser II Species - increases when veld is severely overutilized - unpalatable.	
HABITAT:	Occurs in open veld and between trees and shrubs on most types of soils - sour and sweetveld species.	
FORAGE/FUEL FACTORS:	Forage and fuel production potential of grass estimated on a scale of 0 - 10.	
	Forage = 1	
	Fuel = 1	

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Bothriochloa radicans



Chippindall (1955)

- COMMON NAMES:** Stinkgras
- GRAZING REACTION:** Increaser II Species - Increases when veld is overutilized - unpalatable.
- HABITAT:** Occurs in open veld and between trees and shrubs on soils mainly derived from basalt, gabbro and dolomite - sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
- Forage = 2
- Fuel = 7

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Cenchrus ciliaris



Müller (1984)

- COMMON NAMES:** Blue Buffalo Grass
Bloubuffelgras
- GRAZING REACTION:** Decreaser Species - decreases when veld is overutilized
- moderately palatable.
- HABITAT:** Occurs mainly in open veld between trees and shrubs; mainly on soils derived from gabbro and dolomite, also occurs on termitaria
- sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
Forage = 5
Fuel = 6

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Digitaria eriantha



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Finger Grass
Vingergras
- GRAZING REACTION:** Decreaser Species - decreases when veld is overutilized
- highly palatable.
- HABITAT:** Occurs in open veld between trees and shrubs on most soils
- sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
Forage = 4
Fuel = 4

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Eriopogon cenchroides



Chippindall & Crook
(1976)

- COMMON NAMES:** Common Nine-Awned Grass
Gewone Negenaldgras
- GRAZING REACTION:** Increaser II Species - increases when veld is overutilized
- unpalatable.
- HABITAT:** Occurs in open veld and between trees and shrubs mainly on
soils derived from basalt - sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a
scale of 0 - 10.
- Forage = 1
Fuel = 2

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Eragrostis rigidior



Chippindall & Crook
(1976)

- COMMON NAMES:** Curly-leaved Love Grass
Krublaarplumgras
- GRAZING REACTION:** Increaser II Species - Increases when veld is overutilized
- unpalatable.
- HABITAT:** Occurs in open veld and between trees and shrubs mainly on
soils derived from granite - sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a
scale of 0 -10.
- Forage = 0
Fuel = 2

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Heteropogon contortus



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Speargrass
Pylgras
- GRAZING REACTION:** Increaser II Species - increases when veld is overutilized - moderately palatable.
- HABITAT:** Occurs in open veld and between trees and shrubs on most types of soils - sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
- Forage = 2
Fuel = 4

KEY GRASS SPECIES- KRUGER NATIONAL PARK

Hyparrhenia filipendula



Chippindall & Crook
(1976)

- COMMON NAMES:** Fine Thatch Grass
Fyntamboeklegras
- GRAZING REACTION:** Increaser I Species - increases when veld is extremely underutilized
- unpalatable when mature.
- HABITAT:** Occurs in open veld and between trees and shrubs mainly on soils derived from granite - sourveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
Forage = 5
Fuel = 8

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Hyperthelia dissoluta



Chippindall & Crook
(1976)

- COMMON NAMES:** Tamboekiegras
- GRAZING REACTION:** Increaser I Species - Increases when veld is extremely underutilized
- unpalatable when mature.
- HABITAT:** Occurs in open veld and between trees and shrubs mainly on
soils derived from granite - sourveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a
scale of 0 - 10.
Forage = 4
Fuel = 10

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Panicum coloratum



Müller (1984)

- COMMON NAMES:** Small Panicum
Kleinbuffelgras
- GRAZING REACTION:** Decreaser Species - decreases when veld is overutilized
- highly palatable.
- HABITAT:** Occurs in open veld and between trees and shrubs on most types
of soils derived from basalt - sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a
scale of 0 - 10.
Forage = 7
Fuel = 7

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Panicum maximum



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Buffalo Grass
Gewone Buffelgras
- GRAZING REACTION :** Decreaser Species - decreases when veld is over- or underutilized - palatable.
- HABITAT:** Occurs mainly under trees and shrubs because of higher nutrient status - grows generally on all types of soils - sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 -10.
- Forage = 10
Fuel = 6

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Pogonarthria squarrosa



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES :** Herringbone Grass
Sekelgras
- GRAZING REACTION:** Increaser II Species - Increases when veld is overutilized - unpalatable.
- HABITAT:** Occurs between trees and shrubs mainly on soils derived from granite
- sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
- Forage = 1
Fuel = 3

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Schmidtia pappophoroides



Chippindall (1955)

- COMMON NAMES:** Sand Quik Grass
Sand kweek
- GRAZING REACTION:** Increaser II Species - Increases when veld is overutilized
- highly palatable but unproductive.
- HABITAT:** Occurs between trees and shrubs on all types of soils but mainly those derived from granite - sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 -10.
- Forage = 3
Fuel = 3

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Setaria flabellata

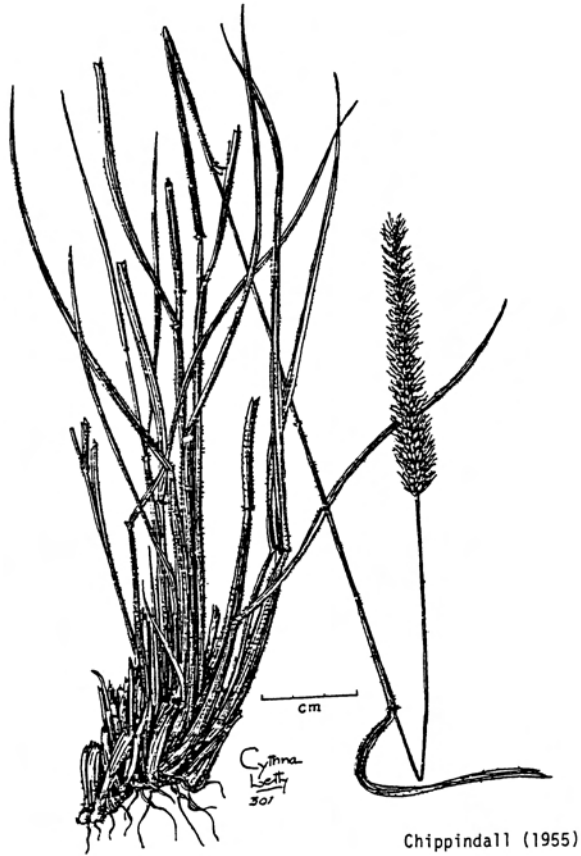


Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Creeping Setaria
Kleinkrulpmannagras
- GRAZING REACTION:** Decreaser Species - decreases when veld is over- or underutilized
- highly palatable.
- HABITAT:** Occurs between trees and shrubs on soils derived from granite
- sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 -10.
Forage = 5
Fuel = 6

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Setaria ingrassata



- COMMON NAMES:** Mannagras
- GRAZING REACTION:** Decreaser Species - decreases when veld is overutilized
- highly palatable.
- HABITAT:** Occurs in open veld on heavy clay soils derived from basalt, gabbro and dolorite - sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
- Forage = 6
- Fuel = 7

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Themeda triandra



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Red Grass
Rooigras
- GRAZING REACTION:** Decreaser Species - decreases when veld is over- or underutilized
- palatable.
- HABITAT:** Occurs in open veld and between trees and shrubs on soils mainly derived from basalt, gabbro and dolerite - sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
- Forage = 5
Fuel = 7

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Tragus berteronianus

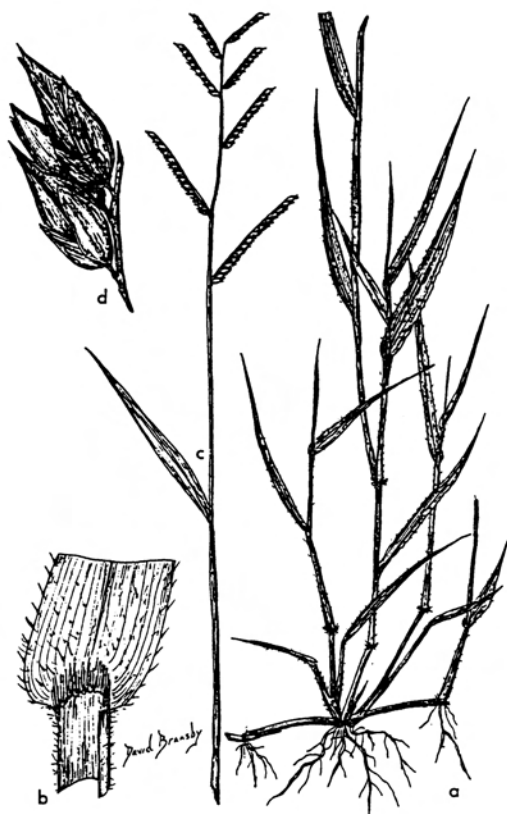


Chippindall & Crook
(1976)

- COMMON NAMES:** Carrot Seed Grass
Wortelsaadgras
- GRAZING REACTION:** Increaser II Species - Increases when veld is extremely overutilized
- palatable but unproductive.
- HABITAT:** Occurs in open veld between trees and shrubs on all types of soil
- sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a scale of 0 - 10.
Forage = 0
Fuel = 0

KEY GRASS SPECIES - KRUGER NATIONAL PARK

Urochloa mosambicensis



Tainton, Bransby & Booysen
(1976)

- COMMON NAMES:** Bushveld Signalgrass
Kruip Signaalgras
- GRAZING REACTION:** Increaser II Species - increases when veld is overutilized
- highly palatable.
- HABITAT:** Occurs in open veld and between trees and shrubs on most types
of soils - sour and sweetveld species.
- FORAGE/FUEL FACTORS:** Forage and fuel production potential of grass estimated on a
scale of 0 - 10.
- Forage = 3
Fuel = 3