

The fodder bank system: its current place in veld management

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The purpose of this paper in the Grassroots is to stimulate views and to receive comments on the principles and practises of the Fodderbank Grazing Management System. The system was introduced to Limpopo Province farmers in 1997, favourably received and up till now, implemented by certain individuals. It is a grazing management system that includes basic grazing management principles, suited for application in communal areas. However, it has never been published for inputs/criticism from other pastoralists. It would be appreciated if viewpoints on this veld management system could be directed to the authors.

Introduction

South African veld is severely degraded. It is estimated that only 30% of the sweetveld remains in good condition, while the Karoo continues to expand. It is estimated that 60% of South African veld is in a bad, 30% in an intermediate and 10% in a good condition. According to Tainton (1981) the reasons are mainly overgrazing and selective

utilisation of grass species. Since 1966, as a countermeasure, rotational grazing, mostly multi-camp systems with short rotational grazing periods, were recommended (O'Reagain and Turner 1992). Experience, however, showed that these systems were poorly adopted by farmers, and that the end product was usually fast rotational systems without specific management objectives. After thorough evaluation researchers also came to the conclusion that the basis of these recommendations proved to be scientifically inaccurate (O'Reagain and Turner 1992). Since then, more information gained led to alterations which improved these systems dramatically.

Current grazing management systems, shortcomings and alterations

Since 1966, different veld management systems were developed with rotational grazing as a basis. The reason was to eliminate selective grazing (Booyesen *et al.* 1975). Grazers always select palatable

grass species first. After grazing palatable species, less palatable species are selected. By applying rotational grazing, frequency and intensity of utilisation are influenced by manipulating the period of absence and period of stay. Selective grazing can thus be controlled to enable management towards better veld condition, animal production and increased carrying capacity.

The following four veld management systems were recommended, as currently used in practice:

High production grazing (HPG)

The accent here is light utilisation of veld. The aim is to utilise only palatable species, which are lightly defoliated. Production of palatable species is thereby stimulated, while unpalatable species become moribund due to accumulated material. To apply HPG, a minimum of four camps (preferably eight) per herd is needed. In comparison to other grazing systems, both the period of stay and the period of absence (rotation cycle) is relatively short. Better animal production and veld condition is obtained, since only highly nutritious and palatable grasses are lightly utilised (Booyesen 1966, 1969).

Controlled selective grazing (CSG)

The objective here is to ensure moderate utilisation of palatable species, while unpalatable species are not utilised at all. Palatable spe-

cies are stimulated, while unpalatable species become moribund and die. In practice, CSG and HPG do not differ much. By just “creaming” the veld both production per animal and production per hectare are increased and veld condition is improved. This rotational grazing system is characterised by eight or more camps per herd, short periods of stay and long periods of absence (Pienaar 1968, Low 1975).

High utilisation grazing (HUG) / Non-selective grazing

The accent here is the total utilisation of available grazing. A camp is grazed until all grasses, including least palatable species, are fully utilised. Animals are forced to utilise species that they would otherwise ignore. By utilising all species, palatable species are not dominated and/or replaced by other species. Better animal production (production per hectare) is obtained, and veld condition is maintained (Booyesen 1969).

Short rotational grazing (SRG)

With this, an attempt is made to ensure that palatable species are utilised only once during the grazing period. The so-called “second bite” which damages the grass tuft, is hereby prevented. For this, a multi-camp system (eight camps or more per herd) and a high grazing pressure is needed. Livestock remain in the camp for a short period, and are removed before grazed tufts are re-utilised. The period of stay is rela-

tively short, and the period of absence relatively long. Grasses remain in a constantly stimulated condition, and it has been suggested that the carrying capacity of veld can be doubled if more camps (up to as many as 37) per herd are included in the system (Savory 1978).

Rotational grazing was thus seen as the starting point of all grazing management systems, since it provided a counter-measure for the selective grazing behaviour of livestock. By controlling selection, animal production, carrying capacity and veld condition could be controlled (this was the viewpoint until recently). However, these grazing systems required large capital inputs in terms of fencing and water supply. In the past, it was accepted that this was part of the package.

Scientific research

Management systems

In direct opposition to some long-held beliefs, continuous grazing cannot be considered better than rotational grazing, or *vice versa*. This is suggested by the following, based on various long-term grazing management trials throughout southern Africa:

In direct opposition to some long-held beliefs, continuous grazing cannot be considered better than rotational grazing, or vice versa.

1. Selective grazing cannot be “bettered” by adding more camps to a rotational system (Gammon and Roberts 1978);

2. Livestock follow the same selection patterns under both rotational and continuous grazing (Gammon and Roberts 1978);

3. Animal production is equal or higher under continuous grazing in comparison to rotational grazing (Hart *et al.* 1988);

4. If compared, veld condition does not differ under continuous grazing in comparison to rotational grazing (Barnes and Denny 1991);

5. Veld deteriorated under both continuous and rotational grazing where a proper rest period was absent (Jordaan *et al.* 2003);

6. Applying rotational grazing does not increase carrying capacity (Barnes and Denny 1991);

7. The stocking rate (LSU/ha/year) (O'Reagain and Turner 1992) and adequate rest (Jordaan 2004) are the two most important factors that have an influence on animal production, irrespective of the grazing system followed.

Grazing

When CSG was initially developed and implemented, the following principles were proposed:

1. Moderate defoliation stimulates

grass regrowth (Low 1975).

2. Unpalatable grass species become moribund and die if not defoliated (Edwards 1981).

Lush regrowth after utilisation, combined with the dead appearance of unpalatable, unutilised tufts often give the impression that this is true. However, Kirkman and Moore (1995), found that utilisation, light or severe, had an adverse effect on the vitality of tufts during the following season: the heavier the utilisation, the bigger the effect.

Thus, good veld management starts with the grazing process (that is, the actual requirements of the animal and physiological response of the plant), and not with the grazing procedure (number of camps or rotation system). The negative effect of grazing must first be looked at in total. Thereafter, attention can be given to aspects such as grazing management systems and the number of required camps in terms of practical herd management.

Principles of veld management

Rest

Adequate rest can be defined as a prolonged period of absence of livestock, long enough for the veld to overcome the effect of previous grazing treatments in terms of both grass production and seed production (vitality).

Research indicated that the period of absence is usually too short to give adequate rest (Barnes and Dempsey 1992). In order to be

seen as “vitality rest”, a period of absence of more than eight weeks (CSG) is needed to overcome the effects of grazing. At present, little is available to indicate what the length of an effective rest period should be. Preliminary results indicate that a full growing season is needed for grasses to recover after defoliation (Barnes 1989, Robinson 1998, Jordaan 2004). It is also clear that grazed veld which receives no rest, progressively deteriorates over time. In practice, rest must be applied regularly to all camps and must be seen as an integral part of veld management.

Stocking rate

It is generally believed that by applying high stocking rates, carrying capacity is increased due to a higher grass production as a result of the continued stimulation of grass species. This belief is totally unfounded. Research by O'Reagain and Turner (1992) indicated that the carrying capacity of veld could be increased by rotational grazing. This lasted for the first season of grazing only. Thereafter, grass vitality and veld condition decreased over time.

Carrying capacity can not be changed by changing the grazing procedure. Carrying capacity is determined by the available material. This, in turn, depends on climatic conditions (mainly rainfall), veld type and veld condition. The carrying capacity of each farm is unique and varies between years.

The importance of using the correct stocking rate must be emphasised. Overstocking is the single most important factor that leads to veld deterioration. It is not feasible to overstock veld and to amend by incorporating long rest periods. Veld recovers partially, but not enough to maintain its previous condition (O'Reagain and Turner 1992).

Since grass production varies from year to year, stocking rates must also be adjusted annually. The norms as set by the Department of Agriculture, Land and Environment are only to serve as a guide. The annual adjustments must be made by the farmer himself.

Separation of veld types

This was one of the practises that was not questioned by more recent research. The influence of grazing on unseparated veld types was recorded by various researchers in the past, and it is clear that, for optimal utilisation, separation of veld types in order to prevent area-selective grazing is of the utmost importance (Kirkman and Moore 1995).

The fodder bank system

Currently, various veld management systems are used in the Limpopo Province. They are largely based on the concept of CSG. This is however a complex and capital intensive grazing management system, which is difficult to apply. Therefore, in practice, farmers have simplified it to rapid rotational graz-

ing. This and the dubious scientific basis of CSG stimulated the development of the fodderbank system.

Requirements for a veld management system

When deciding on a successful grazing management system, the following basic aspects must be attended to. These were the aspects that were used as a basis when the fodder bank system was developed:

- Management must be simple.
- The system must be economical (low infrastructure requirements).
- Systematic rest periods of sufficient length must be incorporated.
- The farmer must be able to do his own fodder flow planning on an annual basis.
- The system must provide a mechanism to adjust stocking rate according to veld productivity on a yearly basis.
- Veld types must be separated to allow separate utilisation of different plant communities.

Applying the fodderbank system

Planning the system

The planning phase of the system is the most important part.

As in the case of most of the other grazing management systems, veld types must be separated. Thereafter, the production potential and the area of each plant community are determined, relative to one another. The farm is now divided into three groups, each similar in production potential and

carrying capacity (all camps are thus divided into one of three camp groups. All three camp groups have the same total carrying capacity/potential).

Accordingly, the calendar year is divided into three equal periods with one period covering the peak growing season. The peak growing season corresponds with the peak rainfall period, and will be as follows in the Limpopo Province: 1 December - 31 March (growing season), 1 April - 31 July (dormant season), 1

August - 31 November (Dormant/ start of growing season)

Implementing the system

The best time to start is at the beginning of the growing season. Thus, on 1 December, all livestock are moved to one third of the farm's veld where they will remain for a full four months. The stocking rate must be within the total carrying capacity of the farm.

Table 1: Sequence of rotation for the three camp groups (A, B and C) over four years.

Year	Camp group	1 Dec - 31 March (Growing season)	1 April - 31 July (End of growing season to dormant period)	1 Aug. - 30 Nov. (Dormant period to beginning of growing season)
1	A	GRAZE	REST	REST
	B	REST	GRAZE	REST
	C	REST	REST	GRAZE
2	A	REST	REST	GRAZE
	B	GRAZE	REST	REST
	C	REST	GRAZE	REST
3	A	REST	GRAZE	REST
	B	REST	REST	GRAZE
	C	GRAZE	REST	REST
4	A	GRAZE	REST	REST
	B	REST	GRAZE	REST
	C	REST	REST	GRAZE

Managing the system

Each camp group (third of the veld) is grazed for four months (a third of the year), continuously, by the total number of cattle that the farm can carry. In this way, the entire farm is grazed annually, but only one third is grazed during the active growing season. During the following year a different third of the veld will be grazed during the growing season (Table 1).

From Table 1, the following emerges:

- Each camp group is grazed during the growing season, once every three years.
- Each camp group rests for two consecutive years during the growing season. This means that two thirds of the veld rests receives an annual rest during the growing season.

Grazing during the growing season is based on an indicator camp system. The camp with the highest potential is utilised first. After utilisation of all palatable species, the animals are moved to the next camp within the camp group. Camp are repeatedly re-utilised upon recovery, irrespective of the fact that they have already been previously grazed. Thus: where more than one camp is available, rotational grazing is applied within the camp group for the full four months. If only one camp is available, the camp is continuously grazed for four months.

During the following two-thirds of the year, the next two camp

groups are similarly grazed. In this case, they are grazed during the dormant season, a grazing treatment which is considered to do the least damage to the grass plant (Low 1975). However, during the dormant season, the whole farm can be grazed (including the camp groups that were grazed during the growing season) if required by circumstances (hail, termites, fire, etc.). The main objective is to ensure that only one third is utilised and two thirds rested during the growing season.

Comparison of the fodder bank system to the requirements for an ideal veld management system

Day to day management is simple. After the initial planning, relatively little time and management inputs are needed for successful management.

- Fencing cost - a minimum of three camps per herd is required (there are normally at least three herds on a farm).
- Rest - the system incorporates ample rest. Two thirds of the veld rests each year during the growing season.
- Fodder flow - by grazing a third of the veld during each third of the year, provision is made for an annual fodder flow.
- Adjusting the stocking rate - annual veld productivity of a farm is a function of the annual rainfall and the plant communities of the veld. Therefore, current carrying capacity

of the veld can be determined at the end of each growing season and the stocking rate adjusted accordingly. If the camp group is, for example, fully utilised by February (75% of the growing period), it is clear that the farm is 25% overstocked. Fodder shortages will then occur during both the other two grazing periods as well.

Plant communities are utilised separately.

Conclusions

What is very clear is that veld condition and animal performance is determined by three crucial factors, namely the separation of plant communities, the maintenance of a realistic stocking rate and rest during the growing season. Complying with these factors will ensure that veld condition and animal production is maintained, irrespective of the grazing management system that is used.

The fodderbank grazing system satisfies all the requirements for sound veld management in the Northern Bushveld. It provides a framework through which the basic principles of veld management can be applied, and might prove to be valuable in the rural areas, where grazing management is problem-

atic.

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