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Basic guidelines to Veld Management – Central Karoo

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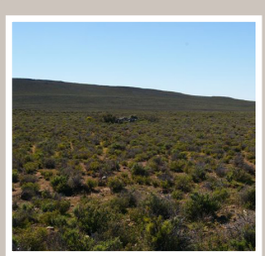
The Central Karoo represents mainly a summer rainfall area with Karoo-type vegetation in the Nama Karoo biome. The average rainfall increases from 100 – 600 mm and the area can be described as arid to semi-arid from west to east. All veld types are sensitive to incorrect grazing practices and it is therefore extremely important that good veld management is practised in order to ensure conservation of the veld by proper utilisation.

Pasture management can be divided into two components, namely:

- pastures (veld (natural pastures), cultivated pastures, etc.); and
- management (**plant** production, **seed** production, **seedling** establishment).

What are pastures and why are they important?
Pastures provide food for animals.
This is determined by:

- plant cover;
- species composition (different types of plants in the veld); and
- productivity (yield of plants).



This is influenced by:

- Soil – can be improved by leaving organic material on the ground, which leads to better water infiltration resulting in a denser plant cover, more food and less erosion.
- Climate (rainfall, temperature, etc.)
- MANAGEMENT – this is where humans fit in. If a farmer does not look after and takes care of his veld, he will not have food for his animals.

Veld
The number of plants or the plant cover, the type of plants (species composition) found in the veld, the size of the plants and how well they grow (productivity) determines how much food there will be and apart from the environment, the farmer has the greatest impact on this. It is therefore important to know how the livestock utilises the veld, to have knowledge of the plants that are there and to know in what condition the veld is.

Veld condition is the condition of the vegetation in relation to certain characteristics such as the species composition, cover, productivity, palatability and nutritional value. Grazing capacity depends on the condition of a camp or the farm's veld.

How does livestock utilise the veld?
They first eat the plants that are palatable and leave the unpalatable ones until last. Palatable plants include the following: koggelmandervoetkaroo (*Limeum aethiopicum*), Karoo bietou (*Tripteris sinuata*), granaatbos (*Rhigozum obovatum*), vinger grass (*Digitaria eriantha*) and Bushman grasses (*Stipagrostis* spp.). Although these plants are dependent on a certain amount of grazing to stimulate growth, excessive use thereof can negatively influence their growth and therefore careful note must be taken on the degree of utilisation of all plants in the veld, particularly the palatable plants. In order to build up reserves for dry periods, no more than 40% of a plant should be used in one season.

If there are too many animals or if they are in a camp for too long, they will graze down all the palatable species while only the unpalatable ones remain and multiply and therefore the farmer can keep fewer animals over a period of time in the same camp. It also leads to trampling of the vegetation and as a result a hard and impermeable soil crust may form which can hinder the germination of seeds.

It is therefore important for the farmer to know his veld, to know which species are desirable, which types he would like a lot of and which are the unpalatable and poisonous species of which he wants little or none in the veld. He must also know which are invasive species, such as *Prosopis* spp. (mesquite

tree), cactuses, slangbos/bankruptbush, etc. and certified weeds such as burweed, cocklebur and silverleaf nightshade (satansbos), etc.

Does the veld improve with time or does it deteriorate?

Do the palatable species increase and grow bigger, thereby creating better cover and providing more food and causing less soil erosion, or are the plants eaten away with only gnarly bits remaining, totally gone or very scarce? Vegetation cover in the Central Karoo increases from 15% to 40% from west to east as a result of the increasing average rainfall. An indication that the veld has deteriorated is the increasing presence of kraalbos, katdoring, kriedoring (*Lycium* spp), blasiebrak, etc.

Another good indicator of the condition of the veld is whether there are seedlings and young plants of the palatable species growing in the veld, or whether there are only seedlings of the unpalatable species and some ephemerals (opslag).

Soil

The way in which the veld is managed will have a long-term impact on the soil. If the veld are stripped and trampled by animals as a result of incorrect management, erosion can take place or the soil surface can form an impermeable layer. This means that the seeds that are present and germinate cannot get their roots through the soil crust in order to establish themselves, and the water runs off instead of penetrating. Consequently rain becomes less effective, the top soil gets washed away and this can lead to donga erosion.

To create an effective seed bed for germination and the establishment of plants the farmer can by means of good management and observation make sure that there is organic material (twigs, leaves, etc.) on the ground that can decompose and gets converted by microbes to food for the plants (organic carbon). Together with the plant cover, this will help to regulate the soil temperature and with holes/hollows in the ground it will help with better water penetration because water will flow away much slower; it will also help to catch the seed and to provide shelter for the young seedlings.

How is the farmer going to make sure that the veld provides enough food for his animals?

He can do this by applying correct **management**. The following are a few points that should be noted:

1. the number of animals that the farm can support (grazing capacity); and
2. the management system that is followed.

Grazing capacity and stocking rate

Grazing capacity is the ability of a specific piece of veld to produce food, therefore the number of animals a farmer can keep in a camp or on the farm, without the deterioration of natural resources (soil, plants, etc.). As already mentioned, this is dependent on the condition of the veld. Grazing capacity is expressed in ha/LSU (hectare per large-stock unit), or roughly how many hectares are required to provide food for a year for one head of cattle weighing 450 kg. Meissner and others (1983) divided all livestock and game as a factor of a large-stock unit. For example: one wool-bearing ewe (dry) = 0.15 LSU, while a wool-bearing ewe with a lamb is equal to 0.20 LSU.

The TOTAL number of animals should not exceed the recommended grazing capacity!

In the Karoo which is mainly a sheep farming area this means that on a farm with a grazing capacity of 30 ha/LSU about 4.5 ha are needed for one sheep (seven wool-bearing (ewes) are equal to one small-frame cow). The farmer can therefore keep approximately 700 sheep on a 3 000 ha farm, in other words 400 breeding ewes plus the lambs, rams and replacement ewes. In die Central Karoo the grazing capacity varies from west to east from 80 ha/LSU to 16 ha/LSU.

Rule of thumb: LSU x 4.1 = breeding ewes for all small stock (Angora, Merino, Dorper, etc.).

Stocking rate is the number of animals that a farmer can keep for a specific period on a certain area of the veld (camp/farm). This includes all animals on the farm, large and small, sheep, cattle, goats, donkeys, ostriches, game, etc. Remember that animals breed, therefore all the animals, large and small, must be taken into account when determining the stocking rate.

Grazing capacity and stocking rate should be reconciled with one another in order to ensure the sustainability of a production system on the farm.

The farm's grazing capacity is an indication of how many animals can be kept there, while stocking rate is an indication of how many animals are kept there. If the farmer keeps more animals than his grazing capacity permits, the condition of the veld will deteriorate with the result that he can keep fewer animals over the long term.

***Grazing capacity** is how many animals you can keep on the farm.*

***Stocking rate** is how many animals you are really keeping on the farm.*

If the farmer keeps fewer animals than he is allowed to keep according to the recommended grazing capacity, this will be to the benefit of the veld and the animals because the veld will build up reserves (new plants, regrowth of existing plants, flowers, seed formation, etc.) and improve over the long term. The farmer will find it easier to overcome drought periods

(may not have to supply additional fodder – cost implication), and he will be able to keep more animals over the long term.

The recommendation is usually to keep fewer animals than those that can be kept according to the recommended grazing capacity.

The recommended grazing capacity is a long-term value and an indication of grazing capacity under optimal conditions. For large parts of the Central Karoo this is 36 ha/LSU. There will be above and below average rainfall years over a 10-year period when more or fewer animals can be kept, but on average this should not be more than one head of cattle (LSU) per 36 ha over the 10-year period. In drier years the number of animals should be reduced to adapt to the amount of fodder that is available. During good years the numbers can be increased gradually but not more than the recommended numbers.

Grazing days

Referring to our example, let's look at the number of grazing days in the veld:

Grazing days = farm size÷grazing capacity x 365 days
= 4 000 ha÷36 ha/LSU x 365 days
= 40 555 grazing days/LSU.

How many days' food is available for 110.5 LSU? (small stock + extra animals)
= total grazing days÷LSU
= 40 555÷110.5
= 367 grazing days

How much food is available for 259 LSU? The number of animals presently on the farm in the example:
= total grazing days÷LSU
= 40 555÷259
= 157 days (5.2 months)

The same method can be used to determine how many grazing days are available in a specific camp.

Example:

Farm size (available veld): 4 000 ha
(Total farm size – (fields+odd pieces of land+roads, etc.))
Recommended grazing capacity: 36 ha/LSU/year
Animals that the farm (veld) can support:
Farm size÷grazing capacity 4 000÷36
= 111 LSU per year

Present stocking rate on farm (veld) (total number of animals kept on farm):

800 breeding ewes (wool-breeding sheep) x 0.15 LSU	= 120 LSU
900 lambs x 0.10 LSU	= 90 LSU
25 rams x 0.19 LSU	= 4.75 LSU
4 head of cattle	= 4 LSU
300 springbok ewes x 0.09 LSU	= 27 LSU
100 springbok rams x 0.10 LSU	= 10 LSU
3 light horse mares x 1.05 LSU	= 3.15 LSU
Total	258. 9 LSU

The veld is carrying 148 more LSU's than recommended and will therefore deteriorate rapidly.
If game, cattle, horses, donkeys, etc. kept in addition to the main farming enterprise, namely small stock, the numbers must first be deducted from the total that the veld can carry before determining how many small stock units can be kept.

Additional animals on the farm = 44.15 LSU (springbok, cattle, horses).

Therefore 111 – 44.5 = 66.85 LSU equivalent to small stock can be kept.

What is the ideal stocking rate (small stock)?

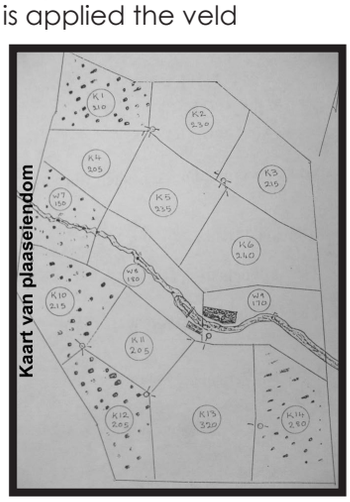
220 breeding ewes x 0.15 LSU	= 33.0 LSU
40 replacement ewes x 0.15 LSU	= 6.0 LSU
260 lambs x 0.10 LSU	= 26.0 LSU
7 rams x 0.19	= 1.,33 LSU
Total number of small stock on the farm:	66.33 LSU

In order to keep more small stock on this farm, the numbers of the "additional" animals must be reduced.

If the farmer wants to keep more animals than allowed according to the grazing capacity of the farm, he must give them additional fodder – in a feeding-lot. Animals should not be fed in the veld because this leads to trampling and deterioration of the condition of the veld. Animals still graze even if they get additional fodder in the veld. If the farmer wants to keep more animals, the period for which the veld can be used will also become shorter (see the box with the example of grazing days). The additional fodder leads to higher costs. If the farmer is not going to feed, this will lead to deterioration of the veld and other grazing fields, as well as lower animal production (therefore a poorer lamb percentage, a lower mating percentage and the growth of animals will decrease). All of these factors have financial implications.

Management

The farmer should preferably keep his stocking rate equal to or even lower than the grazing capacity but if incorrect management is applied the veld can still deteriorate. This is found where animals graze in the same camp every year at the same time of the year, for example a lambing camp or a mating camp, etc. If a camp is used every year when the palatable plants are flowering and form seeds, the plants are unable to multiply. The palatable plants that die are not replaced and after a few years all palatable plants, which are the main source of fodder, are grazed away and fewer animals can therefore be kept. The production of the animals will also decrease because their fodder is substandard.



It is therefore important that a rotation rest/grazing system should be followed where the farm is divided into camps and each camp gets a rest period during the year. To prevent continuous grazing, the farm should be divided into camps and the animals

should be rotated between the camps throughout the year. These camps should also have a central watering place so that the grazing can be spread out evenly throughout the camp.

Example:
A farm with many camps can divide the camps into four groups, where the camps of each group represent the different types of veld on the farm, for example mountainous veld, randteveld, plains and water lanes (rivers). The surface and grazing capacity of each group should more or less be equal in size and therefore be able to carry the same number of animals.

One group annually gets the opportunity to rest for the whole year. The same group is never used for grazing in the same season over a four-year period. The group of camps therefore gets sufficient opportunity to flower, form seeds, seedlings get a chance to establish themselves and reserves can build up through regrowth.

A four-camp grazing system:

	Dec/Jan/ Feb	March/ Apr/May	Jun/Jul/ Aug	Sep/Oct/ Nov	Rest
Year 1	Camp A	Camp B	Camp C	Camp A	Camp D
Year 2	Camp B	Camp C	Camp D	Camp B	Camp A
Year 3	Camp C	Camp D	Camp A	Camp C	Camp B
Year 4	Camp D	Camp A	Camp B	Camp D	Camp C

Only three groups are used annually, while the fourth group of camps is rested for the whole year and only used again for grazing in the third grazing season. The group is therefore rested for 18 months in total after which it gets intermittent rest for 6 - 9 months over a four-year period. The 18-month rest period follows after the group has been used for grazing twice in the previous calendar year with only six months of rest between the grazing periods.

A farm with few camps can follow a four-camp system on the same basis as the four-group camp system.

Game:
Game is not easily rotated in a grazing system with camps. Game continuously grazes in the veld and should therefore be kept at 60% or even less of the recommended stocking rate. This will ensure that the veld will have a better chance of recovering after the rains. With continuous grazing the animals tend to concentrate on the more palatable parts, in other words the flowers and this is the next generation of plants.

Drought management:
Before an area is hit by a disaster drought the number of animals has to be reduced. The animals must be moved to the feeding-lot to be rounded off and to save the reserves of the veld. The number of animals must be reduced to a core herd by selling the castrated animals first, followed by older animals and then the culls, including ewes that have not lambed in the previous season. Strict breed standards have to be applied when choosing culls.

Regardless of whether or not you have a veld management system, keep the number of animals low so that the impact on the veld is not too great and droughts (seasons/disasters) can be more easily handled. Get to know your veld and note the presence/absence of seedlings of the palatable species. Make sure that preferably not more than 50% of a plant is used and that there is organic material on the ground (twigs, leaves, etc.). Lastly you should also look at the condition of your animals and their breeding. If the condition of your animals starts to deteriorate, you will often find that the veld's reserves have become impoverished. The most important thing to remember is that you are a veld farmer and not an animal farmer.

Contact your local extension officer (pasture expert) and LandCare officer for assistance with a veld management plan for a specific farm.

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Remember, you firstly farm with your veld and then with your animals. If you do not look after your veld, you will not have fodder for your animals and therefore generate no income!