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Selection of property of game farming

Before selecting a property for game ranching or farming, it is important to have an idea of the different veld types in South Africa, the species of game one wishes to farm with, and where they occurred naturally.

With very sandy soils, animals' hooves could grow too long.

Flora

South Africa has more than 24 000 plant species, making it one of the richest floral areas in the world. The vegetation found in South Africa can be divided into 70 veld types that can be grouped in 24 basic types consisting of five main units.

I wish to mention the game that occurred naturally in these five main units:

- **Fynbos:** Bontebok, buffalo, common duiker, eland, grey rhebok, Cape grysbok, klipspringer**,** red hartebeest, reedbuck, black rhino, steenbok, warthog, Cape mountain zebra.
- **Karoo:** Blesbok, common duiker, eland, gemsbok, giraffe, grey rhebok, klipspringer, kudu, mountain reedbuck, ostrich, red hartebeest, black rhino, white rhino, springbok, steenbok, warthog, black wildebeest, Cape mountain zebra.
- **Forests:** Bushbuck, bushpig, blue duiker, common duiker, red duiker, elephant, nyala.
- **Savanna:** Blesbok, buffalo, bushbuck, bushpig, blue duiker, common duiker, red duiker, eland, elephant, gemsbok, giraffe, grey rhebok, Sharpe's grysbok, hippopotamus, impala, klipspringer, kudu, mountain reedbuck, nyala, oribi, ostrich, red hartebeest, reedbuck, black rhino, white rhino, roan antelope, sable antelope, springbok, steenbok, suni, tsessebe, warthog, waterbuck, blue wildebeest, Burchell's zebra.
- **Grassveld:** Blesbok, buffalo, common duiker, eland, grey rhebok, klipspringer, kudu, mountain reedbuck, oribi, ostrich, red hartebeest, reedbuck, white rhino, springbok, steenbok, warthog, black wildebeest, blue wildebeest, Burchell's zebra.

The above is a general guideline of what one could ranch with in a particular area (except of course for intensive game ranching). However, there are also other important factors to consider, especially when moving animals to areas where they did not naturally occur before, e.g:

1. Climate: Sable or roan to areas where winters are very severe – sable seem to be more susceptible to cold than roan. Frostbite damages their ears and many animals, especially old individuals or the progeny of old animals, often lose the tips of the ears.

In the Northern Cape, most of the trees and shrubs lose their leaves in winter. Fortunately, vaalbos (*Tragonanthus camphorata*) does not lose its leaves, providing good shelter for animals on cold winter nights. I do not regard vaalbos as a good nutritional bush (although some animals might use it) but rather as a 'blanket' in the Northern Cape.

2. Disease aspect: Springbok, blesbok, black wildebeest

Copper deficiencies in the water can cause fractures in animals.

Tall trees make darting from a helicopter difficult, while the bushes are more suitable for boma capturing.

and eland are susceptible to heartwater but there are exceptions.

3. Soil type: With very sandy soils, animals' hooves could grow too long. It is good if a portion of a farm is sandy and another part stony (or gravelly) to ensure good hoof wear. When ranching with Cape mountain zebra (or Hartmann's zebra) this factor is often overlooked, with serious consequences. There must be rocky outcrops, otherwise their hooves will grow too long.

4. Rainfall: High rainfall allows for higher carrying capacity but unfortunately there are also some disadvantages:

- More internal and external parasites (ticks): This is important when ranching with certain animals, e.g. roan – calves are quite sensitive to theileriosis. Apply good tick control through regular controlled burning and the use of dips (e.g. Tick-Off, Duncan Applicator).
- Nutritional value of grazing in winter is not so good – more supplementary feeding than in lower rainfall areas.

5. Good variation of vegetation: When selecting a farm, look for a property with as much variation in vegetation, soil type and bush cover as possible. Pay attention to the utilisation potential of certain terrain types – mountainous terrain might look good but flat areas are often overgrazed before game will move into mountains.

6. Distance from nearest airport: Hunters will fly in or even travel long distances to get their sought-after trophies. Ecotourists, however, may not. A farm should not be situated too far from main centres or highways.

7. Public roads: Many good, potential game-ranching are as have public roads going through them and unfortunately poaching from roads has become a reality in South Africa. Select a farm with no public roads crossing it. If there are roads, try to fence off a 100–200 m corridor from the public road. One can utilise this corridor by keeping domestic stock there.

8. Power lines: Many helicopter pilots have been killed by flying into power lines. If at all possible, lay underground cables, not only for safety but also for aesthetic reasons.

9. Fencing is costly: 21 strands will be approximately R70 000/km without jackal-proof and electrification; with these added, one would be looking at R100 000/km.

10. Shape of property: A square-shaped property is cheaper to fence than a rectangular one: A – Perimeter fence will be 20 km; B – Perimeter fence will be 16 km (a saving of 4 km in fencing material).

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11. Select a farm where game capture will not be too difficult:

a) Harvesting – hunting or capture

b) Bomas – enough bush to build bomas but also for species like buffalo – need shelter

c) Terrain – not too difficult to pick up animals if darting must be done. Browsers need enough edible bush.

12. Predators – where there are larger predators, losses can be substantial; consider this threat when selecting a farm.

13. Water

a) How strong is the underground water?

b) It is wise to do a water analysis before purchasing a farm. Macro- and micro-element imbalances and even heavy metal contamination of water could cause serious problems later. Fluorosis on one property near Pretoria had very adverse effects on the production of the animals. Certain areas near Brits have high selenium contents; certain farms have a high iron content.

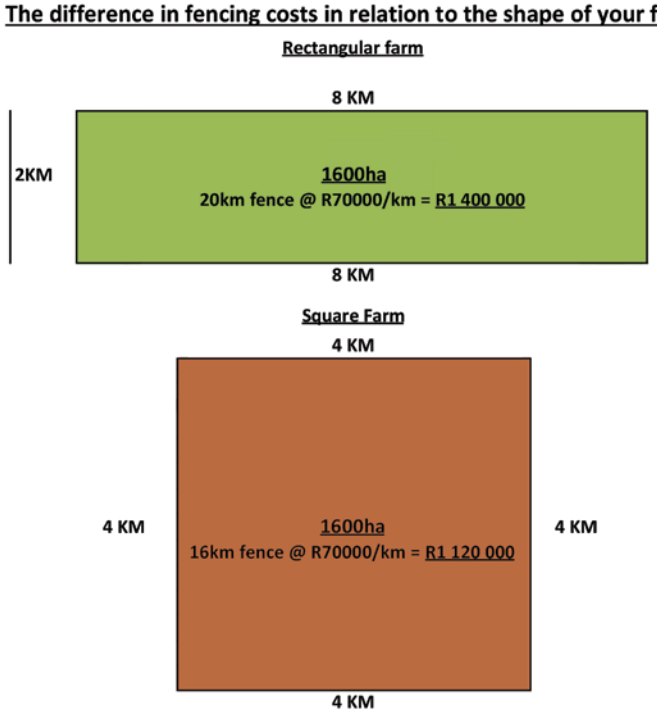
c) Certain farms have deficiencies, e.g. Cu deficiency on certain properties in the south-eastern Cape. Mining activities could also contaminate water. (One borehole sample on a game farm in Limpopo showed between 10–20 times the regarded safe levels of 7 elements; the following minerals were found: arsenic, selenium, beryllium, molybdenum, cadmium, antimony, tellurium.)

14. Macro- and micro-elements

What is the importance of macro- and micro-elements?

Many of the elements are essential for the coenzyme functions of the body, in other words to allow normal metabolism to occur in the body (e.g. iron, copper, zinc, molybdenum). Some trace elements are important to form other compounds in the body, e.g.:

- **Iodine (I)** – essential to produce thyroid hormone.
- **Iron (Fe)** – for haemoglobin and myoglobin formation in blood and muscle.
- **Calcium (Ca)** and **phosphorous (P)** – important for normal bone formation.
- **Copper (Cu)** – has many functions:
  - Ossification (bone fractures with deficiency)
  - Blood formation (anaemia with deficiency)
  - Pigmentation
  - CNS (central nervous system development) sway-back with deficiency in lambs
  - Cu essential for normal hair and wool growth – keratinisation of wool
  - Reproduction.
- **Molybdenum (Mo)** – too high or too low is bad. High Mo will precipitate a copper deficiency. Mo is a trace element also important for enzyme functions in the body.
- **Cobalt (Co)** – important for formation of vitamin B_{12}. Deficiency will result in anaemia. B_{12} is synthesised in the rumen of herbivores.
- **Manganese (Mn)** – important in formation of bone and cartilage; deficiency causes skeletal abnormalities. Also in reproductive processes.
- **Fluorine** – essential for mineralisation, e.g. teeth and skeletal structures (helps with hardening).
- **Selenium** – essential for normal muscle function (deficiency causes degenerative myopathy or muscle damage).



A square-shaped property is cheaper to fence than a rectangular one

High sulphur (S) will precipitate a selenium deficiency; it will also precipitate molybdenum (Mo) deficiency.

Factors affecting macro- and micro-elements in soil

a. Soil type (or parent rock) determines the concentration of trace elements in the soil. The uptake of trace elements into a plant depends on the plant species and on a number of soil properties that determine the bio-availability of the element in the soil. These properties include the total concentration of the elements, soil pH, moisture content, organic water content, clay content and redox conditions.

b. Soil pH will affect the trace element uptake into plants and animals. High pH will lead to elevated Molybdenum (Mo) and selenium contents of plants and low copper and cobalt. This is important in the case of certain animals like roan and sable where problems have been experienced when keeping these animals on alkaline soils. Copper and cobalt are two very important minerals, especially for roan and sable, and bio-availability of these minerals is much better in soils with lower pH. Trace element concentrations even differ between grass species and browse (grass species normally have higher concentrations).

The size of a farm/camps are very important when choosing a farm or fencing, as the risk of mortalities due to fire increases as camp size decreases. Pictured are sable burned to death. It is also wise to clear corners of all camps from grass and bush as a safety precaution for wildlife.

This sable in Cookhouse area changed colour from black to red – confirmed as copper deficiency

Deficiencies

Problems with deficiencies are not only seen on small properties but also in national parks in Africa. An interesting example was in Nakuru Park in Kenya where a copper deficiency was picked up in waterbuck and impala. These two species were utilising a grass type (*Sporobolus spicatus*) that had a high Mo (molybdenum) content (9 ppm) compared to other grasses, which caused a copper deficiency. The soil pH was also alkaline, causing more molybdenum to be absorbed into the grass and less copper. Research in Tanzania by McNaughton and Georgiadis (1988) showed that spatial distribution of animals in the Serengeti National Park was related to the mineral content of forages (and that magnesium, sodium and phosphorous were particularly important). Further research also showed that the seasonal movements of migratory grazers in the Serengeti were also related to grass mineral content. Important minerals identified here were calcium, copper, nitrogen, sodium, zinc, magnesium and phosphorous.

In South Africa, Ben-Shahara & Coe (1992) showed that the movements of migratory grazers were related to monthly variations in nitrogen and phosphorous content of grasses. Thus, the enclosure of wildlife within relatively small national parks (not to mention small game farms or paddocks on game farms) may restrict their opportunity through migration to acquire adequate major and trace elements. I personally think that this aspect of wildlife nutrition is going to become more and more important in South Africa. The main reason is that we are trying to ranch (and in a lot of cases succeeding) with wildlife intensively, and will have to know when and where to supplement and with what, as we have a big country with a lot of variables, and *that* to me could become a problem in future. I wish to mention just a few cases I myself have seen or heard of.

Case 1: 'Shipping fever'-type of pneumonias in roan antelope. Management and especially nutrition (lack of trace elements amongst others) definitely play a role. Copper and cobalt deficiencies and lack of roughage definitely play a role. Severe pneumonia problems occurred on four farms that had a cobalt deficiency. One property used as a control had plenty of cobalt (Ventersdorp lava) and had never had a single case of pneumonia for the past 25 years of ranching with roan.

Case 2: Twenty-odd sable died, which was confirmed through histopathology by Onderstepoort pathologists as a selenium deficiency.

Case 3: Sable in Cookhouse area changed colour from black to red – confirmed as copper deficiency.

Case 4: A group of sable in the Thabazimbi area changed to a reddish colour. They were fed on a game cube made from sicklebush or *Dichrostagys*. When analysed, it was found that these game cubes were very high in iron and precipitated a secondary copper deficiency.

Case 5: A group of buffalo from the Nelspruit area (Green Stone Belt) completed their quarantine and were exposed to high iron concentrations in water. Thereafter, they were moved to the Northern Cape. Four leg fractures occurred in one afternoon. A copper deficiency was suspected to have been the cause. Research by Fordyce (1996) in Zimbabwe (north-eastern part) suggested that high concentrations of iron (Fe) and manganese (Mn) in soil and forage inhibit the availability and therefore the uptake of trace elements, such as copper (Cu) or zinc (Zn).

These are just a few cases where a diagnosis could be made. Unfortunately, trace element deficiencies often go unnoticed and can have serious consequences for production and reproduction.

Dr Johan Kriek,* GAME & HUNT *co-editor: animal health, would like to write about topics that readers wish to learn more about. You are welcome to forward such topics or any questions to us at:* editor@wildlife-hunt.co.za *– Editor.

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