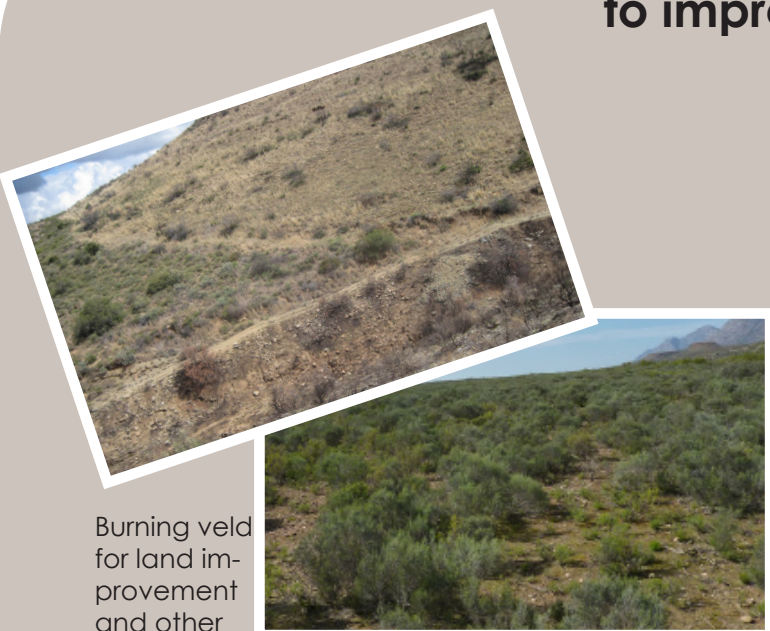




## Basic guidelines for burning Mountain Renosterveld to improve veld.

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Burning veld for land improvement and other purposes is a widespread practice in various veld types in the Western Cape and other parts of South Africa.

This information brochure focuses on the burning of Mountain Renosterveld, but the general principles and legislation it refers to is applicable to all veld types, especially those found in the winter rainfall region.

It is generally accepted that, before being grazed incorrectly, Mountain Renosterveld comprised a larger proportion of grass and a smaller proportion of renosterbos.

As veld deteriorates, the renosterbos component can increase to such an extent that the plant types best suited for grazing can be crowded out. Where Mountain Renosterveld has deteriorated to this extent, it can be improved by controlled burns (among other methods). Old lands in areas that are being overwhelmed by renosterbos can also be controlled through burning.

Controlled burns can also be used to control alien invader plants, to reduce the amount of flammable material to reduce the likely occurrence of uncontrolled burns, to promote the growth of desirable

plants for the flower industry, and to improve water yield in a catchment area. However, the most important goal is to maintain and even improve a sustainable population of existing plants and animals. With fynbos, the veld should not be burned until at least 50% of those species that take the longest to reach maturity have bloomed, that is 8 to 20 years after the previous burn.

Fire is a natural part of the ecosystem of Sub-Saharan Africa. The way humans have used and, above all, misused this ecosystem, has changed the biodiversity of the veld. Although the use of fire is a high-risk activity, provided it is used correctly, it is a very successful method of substantially restoring the veld to its original condition.

### Burning Mountain Renosterveld

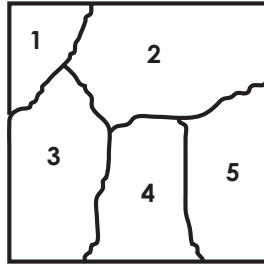
- The purpose of burning is to suppress renosterbos so that grasses have the opportunity to re-establish themselves. This has benefits for animal production as well as for veld improvement. After burning, it is important to ensure that renosterbos bushes do not take over so that stands of grass can become established. Initially these will be less palatable species such as *Merxmuellera* spp (Wire grass or Suurpol) but these could be replaced by more palatable species such as *Themeda triandra* (rooigras).
- Allow approximately four years to elapse between the first two burns. The second burn must take place before the young renosterbos bushes go to seed. This will be a cooler fire.
- To manage renosterveld and old lands with renosterbos for an improved grass sward, use a

Rooigras



burning cycle of >4 years, preferably longer (7–12 years) because certain essential plants like nitrogen-fixing legumes require a longer cycle.

- To manage proteas in fynbos, use a burning cycle of >10 years, but not longer than 25 years because veld can become dormant over such a long period.
- When the veld is burned for the first time, it should not all be burned at once. Divide the veld into blocks and burn the blocks in successive years or every second year to obtain veld of different ages and to maintain species diversity.
- On game farms, the size of burning blocks must be adjusted to fit the number of game animals on the land. Unwise burning could cause a concentration of game on some grazing areas, causing overgrazing and therefore undermining the value of controlled burning.



## Planning a burn

It is essential to thoroughly plan a burn before doing it. To decide today that a burn would be a good idea and to simply start burning tomorrow could lead to great loss and distress. Good planning, preparation and implementation will avoid problems and give a good result. We know that our intention is to improve the biodiversity of the veld, but there are many factors which have an impact on doing a controlled burn, described below.

## Legislation

Certain rules and regulations have to be complied with before veld can be burned. Make sure you know what these are. The most important of these are described below.

**Ensure that you comply with all your legal obligations!**

### *Conservation of Agricultural Resources Act (Act 43 of 1983)*

Regulation 12 of the Conservation of Agricultural Resources Act (Act 43 of 1983) determines that a permit must be obtained to burn for grazing. Contact your local LandCare office to apply for approval for the burn from the National Department of Agriculture.

### *National Veld and Forest Fire Act (Act 101 of 1998)*

The Act prescribes a number of duties and responsibilities on land owners and managers of land.

Join your local fire protection association (FPA) and contact the FPA when you want to burn. An FPA has the power to make rules within the minimum requirements of the law. When you are part of an FPA, its rules will be your guidelines for prescriptions for firebreaks (including minimum widths), necessary precautions that must be taken during burns, the point in the burning season that block burns may be done, who must be informed, etc.

Where no FPA exists, the Act makes provision for minimum standards and prescriptions:

- When an owner wishes to make a firebreak, he or she must take account of weather, climate, terrain and vegetation.
- A firebreak must be wide and long enough to have a reasonable chance of stopping a veld fire, and it may not cause soil erosion.
- Give your neighbour two weeks' notice that you will be burning, whether for a firebreak or for a controlled fire.
- You must possess firefighting equipment and keep it ready for use.
- You must train workers how to use this equipment.
- You may not burn when the Fire Danger Rating Index is high or extremely high.

### *Local and district municipality by-laws*

Find out whether there are any local by-laws that regulate burning. Your local fire station should know what these are.

## Weather conditions and terrain

Bear the following points in mind when you plan to burn:

- Winter rainfall region: burn at the end of autumn (before the winter rain and after the thunder storms of summer to minimise flood damage). Burning in autumn favours palatable grasses and bulbs, while burning in summer favours undesirable plants like renosterbos.
- Summer rainfall region: burn between early spring and midsummer.
- Fynbos should not be burned in winter or spring.
- Do not burn fynbosveld unless you have seen all protea species flowering for at least three seasons.
- Renosterveld should not be burned unless the vegetation is at least 50 cm high and various species of shrubs have reached maturity.
- In autumn, there is a limited window period when the weather is suitable for a burn. In some years, there may be as few as 5 or 7 days that are suitable. For this reason, planning and preparation must be complete before the window period so that a burn can be done as soon as there is a suitable day.



The weather conditions and the terrain have a direct impact on the outcome of the burn. For this reason, the following should be borne in mind:

- The first time a burn takes place, it will be a hot fire, especially if the veld last burned 15 years earlier. The weather (wind, temperature etc.) will therefore need to be carefully considered before a fire is started.
- The wind will have the biggest impact on the fire. Where the terrain is fairly even, the wind will determine the direction and rate of spread of the fire. Do not burn when the wind speed is over 15 km/h.



- The temperature and relative humidity also has a direct influence over the control and outcome of the fire. If the relative humidity is 65% or more, it is unlikely that the vegetation will burn. If the humidity is below 15%, it will be difficult to extinguish the fire. Burn when the relative humidity falls between 20% and 50%, and the temperature falls between 10° and 30° C<sup>1</sup>.
- A good rain shower about a week before a burn will help to protect the soil.
- Weather forecasts are essential information for determining the best day to set a fire. Most FPAs



issue a Fire Danger Rating Index 3 to 5 days in advance based on a weather forecast. You can also obtain a forecast from the Weather Service. If there is a slope or hill/mountain within a burning block, it will influence the direction that the fire is likely to burn. If there is no wind, the fire will rapidly burn up a slope. With some wind, the fire may burn extremely quickly up a slope.

Even if the wind is blowing down a slope, the fire will burn slowly downhill and then speed up when it reaches level ground. Avoid burning deep ravines or steep slopes as separate blocks. This could cause serious problems if the wind moves through a ravine or up a slope.

- Chop down alien invader plants before a burn and spread the wood to avoid a concentration of flammable material in one place.

### Preparing to burn

Planning is essential, especially when burning for the first time because of the large quantity of flammable material on the land.

- It is important to make fire breaks around the block from where the fire can be set. The height of the vegetation will determine how wide the break needs to be. On level ground, the width is usually 1.5 times the average plant height. The steeper the slope, the wider the break needs to be.
- Start the fire on the most dangerous side/corner. Fires can be more easily controlled when they are small. This will usually be on the western side of the burning block because it is likely that a burn will take place with a light south-easterly wind. This break should preferably be wider than the others.
- In the case of game farms with no internal fences, farm roads can be used as firebreaks to divide the veld into blocks. In the case of a livestock farm, the different camps can serve as blocks. More than one camp can be burned at a time. It is important that the area is completely burned, i.e., that there are no unburned spots.
- As a precaution, an area 2 m wide can be cleaned along fences as a fire break. This is particularly important along a farm's border to en-

sure that the fire does not jump over the boundary or over a main road. Find out whether there are any local FPA rules about this.

- Ensure that necessary equipment is in a state of readiness.
- Give your neighbours at least two weeks' notice if you plan to burn, whether this is to make a fire break or to do a controlled block burn.
- Arrange more labour if the area is large or the terrain is difficult. It is better to be safe than sorry.
- Train your workers how to use firefighting equipment.
- Ask your local agriculture office (LandCare), FPA and CapeNature to find out about any requirements for planned burns and the burning of Mountain Renosterveld.



### The day of the burn

Between the end of summer and possible thunderstorms but before the cold fronts of winter begin, there is a window period suitable for controlled burning. Keep an eye on the medium-term weather forecast. There may be two or three days suitable for burning.

Inform your neighbours and other interested and affected parties such as CapeNature and your district council the day/night before you burn. See local FPA rules for guidance.

- Before you set the fire, make sure that all labourers are in the right places with the right equipment. Spades are effective in sandy soil, and fire beaters can be used. There must also be enough labourers with water-filled backpacks on hand.
- Additional sources of water should be placed in the veld so that water backpacks can be refilled.
- Where the terrain is accessible, the use of a water car with a pump or a "bakkiesakkie" is very useful.
- The fire should preferably be started in the morning in autumn with a light southeasterly wind (the prevailing wind direction).
- A maize stalk dipped in diesel can be used to start and spread a fire.
- A fire is started on the western side so that the fire moves in towards the wind. A fire will burn slowly if it is going against the wind.
- A burning strip can steadily be made wider until the front is 5 to 7 times wider than the average plant height. Now it is possible to move on both sides.
- The fire should then be started on the eastern side of the block to burn with the wind. That causes a hotter, quicker fire.
- Remember, the wind is the dominant factor in fire control. Because heat rises, it tends to draw in air so the wind speed at the fire front increases.

<sup>1</sup>Goldammer LG & de Ronde C. 2004. Wildland Fire Management Handbook for Sub-Saharan Africa. Freiburg, Germany: Global Fire Monitoring Center: 306–307.

- Make sure that the entire block is completely burned. There should be no unburned renosterbos.
- Do not leave fires unattended.

### After the fire is over

- Do not leave extinguished fires unattended for at least two days after the fire is over.
- Make sure that a 10 m strip all the way inside the burning block's edge is 100% extinguished.
- For two weeks after a burn, do daily checks of the area, especially during warm afternoons (unless it rains). Look for hot spots and smoke, especially where alien invasive vegetation has been chopped down.
- Keep accurate records about burns, including the date and time and what the weather conditions were. Use a map to make records of the area, including the age of the veld in different blocks. This will build up a set of information that will make future controlled burns easier and safer.

### Veld management after a burn

A second fire can be planned about four years later to remove renosterbos that has germinated but not yet flowered and formed seed. This fire will be cooler and because there will be less flammable material, thereby making it easier to control.

Further controlled fires will have to take place regularly to destroy the renosterbos seedbank. Renosterbos should not get another opportunity to form seed. After the second fire, it is recommended that fires are set every four to ten years.

It is very important to rest the veld after burning. Do not put livestock in a burned area between July and November. Burned veld should rest for at least one complete growing season, or preferably 18 to 24 months for optimal veld utilisation. This will give the grass time to form seed and the seed to fall to the ground, thereby establishing a source of seeds.

Seed production is a key success factor for veld improvement. For this reason, grazing after a fire must be managed so that the seed production of desirable plant species is not compromised. Cattle can be allowed to graze grass short, provided they do not eat more than 50% of the leaves (high grazing pressure for short periods). Resting the veld will allow regrowth to occur and increase the size of the seedbank. Because sheep graze more selectively and graze grass closer to the ground, it is best that cattle graze the land for the first season after burning, and preferably also the second.

After that, sheep can graze in the area. If a good grass sward becomes established, it will help to sow seed of climax grasses to improve the veld more quickly.



It is important to follow up in areas where there are

alien invader plants, especially wattle and hakea, because a lot of germination will have taken place after a fire. When it comes to alien invader plants that flourish after burning, it is essential to keep these under control while they are still small. It will be more difficult to control them later. It is better to delay a planned burn on another block by a year and use the money to bring invader seedlings under control.

**Seed production is a key success factor for veld improvement, so it is important to rest the veld after burning.**

### Acknowledgements

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