Lions River Fire Protection Association
By Landowners – For Landowners

FIRE MANAGEMENT GUIDELINES – Part 2

Compiled by Bobby Hoole

Fire Management - Overview

Fire management on agricultural land is important to protect the safety and well-being of people and communities and to protect agricultural industries that are vital to the Midlands. These guidelines ' provide practical fire management advice for people living and working on cropping, grazing, plantation timber and rural lifestyle properties, particularly those who are undertaking property planning or are new to farming.

This document will be a useful reference for anyone involved in planning or promoting fire management on agricultural land in the Midlands.

All public and private landowners and managers in Kwazulu Natal have legislated responsibilities regarding fire management and fire extinguishment. Most of these responsibilities arise from the *National Veld and Forest Fire Act 101 of 1998*. This document integrates the legal responsibilities arising from relevant fire management legislation with advice to help landowners and managers form an overall picture of what is needed to achieve fire safety on rural properties. It is designed to be used for a number of purposes, such as planning fire management, as a tool in information
or training courses and improving general community knowledge about fire management.

This document provides general advice that may not be relevant in all circumstances. Landowners and managers are always encouraged to seek additional expert advice about fire management on their property where required.

1. Property Fire Management Plans

Landowners and managers are advised to develop and implement an effective property fi re management plan that identifies and addresses fire risks present on their property, including how to respond to and recover from a fire.

a. Typical plan contents

A property fire management plan should include plans for personal safety, fire prevention, asset protection, fire suppression and recovery from fire.

b. Identifying special needs

Landowners and managers with special requirements for fire suppression on their property, such as organic farms, are encouraged to contact the LRFPA office and ensure that their requirements are entered into LRFPA plans.

c. Planning for the long term

Fire management needs to be planned for the long term to be effective. Each stage of a pasture, crop or plantation will have different fuel load and different fuel arrangement characteristics. Plan for the stage where the fuel hazard will be greatest. For example, plan ahead to minimise the fire risk when trees or crops have fully grown.

d. Plantation establishment

When establishing new plantations, landowners and managers are required to contact DAFF and / or Forestry South Africa about planning scheme requirements, such as permits, setbacks from dwellings and buildings, and plantation development notices.

2. Recovery planning

Planning for recovery is an important part of minimising the impact of fire. The period following a fire can be difficult, but it can also provide an opportunity to implement change.

a. Recovery planning

Landowners and managers are encouraged to plan for recovery as part of an overall plan for fire management on their property.

Issues to consider in recovery plans include:

- the welfare of people;
- weed management, erosion control, environmental issues;
- stock management;
- insurance needs (personal and business); and
- possible changes to fencing, sheds and property layout and enterprises.

A number of organisations provide assistance before and after a fire has happened:

- Local / District Municipalities coordinate the recovery of the community after fire. They are often the initial contact point for recovery issues.
- The Department of Welfare assists in meeting the welfare needs of people.
- The Department of Agriculture provides technical agricultural advice before and after a fire.
- The Department of Agriculture and Environmental Affairs provides environmental advice.

b. Pasture management

Landowners and managers are encouraged to plan ahead to manage pasture after fire.

c. Stock management plan

Have a low-fuel area for stock during a fire situation. This could be a grazed or green camps or a grazed camp with perimeter fire breaks. Consider having a central laneway to manage stock and move them before fire threatens. Consider trucking out important stock where practical.

Plan a containment area where stock can be fed after a fire. This reduces the risk of weed spread across the property. Monitor this area for weeds.

3. Property and building design and maintenance

Careful property layout and building design can provide long-lasting fire safety benefits.

a. Property layout and building design

Consider property layout to minimise the chance that fire will impact on key assets. A key step in maximising the chance that buildings, such as houses and sheds, will survive a fire is to minimise the impact of embers. This may involve such ideas as creating a defendable space around buildings and ensuring that there are no gaps between the shed cladding and the ground or slab to prevent embers entering sheds.

Consider using windbreaks to slow wind approaching key assets and to catch embers before they reach these assets. Use vegetation in the windbreaks that produces a minimum of embers.

b. Building in high fire risk locations

Buildings in a fire prone locations – slopes and crests of hills – careful consideration needs to be given to the likely impact of fire.

c. Maintenance

Good building and property design is only effective if it is supported by good maintenance. Maintain low fuel loads around buildings and assets by managing vegetation and locating items such as woodpiles or old tyres away from these assets.

4. Vegetation management

Vegetation (trees, grasses and shrubs) is an important asset on all properties. Management of vegetation on the property can have fire safety and environmental benefits.

a. Managing vegetation

Protect assets by reducing fuel loads around house blocks and sheds. Protect fences from radiant heat and direct flame contact by keeping them free of vegetation and weeds.

Landowners and managers are advised to:

- keep dense stands of shrubs away from the inner zone, which is 10 m around buildings;
- use low fire fuel options, such as green lawns, paving and pebble mulch near buildings;
- consider having clumps of vegetation rather than continuous vegetation; and
- design vegetation layout near buildings so that fire is not funnelled towards key assets.

b. Selecting vegetation

To protect the long-term value of property, consider planting vegetation that regenerates or reshoots after a fire. It is difficult and complex to suggest specific plants for fire safety because the way a plant burns depends on such issues as how old it is, how well watered and managed it is, and what is growing nearby.

It is suggested that plants that burn easily and produce embers be located away from buildings.

This includes plants that:

- create dry, dead debris;
- have loose flaky bark;
- have a lot of fine leaves, particularly if they are continuous from the ground up; and
- have very low moisture content.

While some plants may burn more readily than others, under the right conditions all plants will burn. Consequently, do not rely solely on plants being fi re resistant for fire safety.

5. Environmental protection

As part of a fire management plan, consider how to protect the property from environmental damage and promote environmental assets, such as indigenous vegetation

a. Environmental planning

Landowners and managers are encouraged to:

- identify environmental assets that require protection from fire or from fire management works, such as fuel-reduction burning. This may include such areas as waterways, habitat for indigenous fauna, and revegetation sites;
- ensure that fire management works do not result in large areas of bare ground that may cause erosion and encourage the growth of weeds;
- remove weeds that have high fuel loads for fire safety and environmental benefits;
- minimise soil disturbance around trees to protect the health of trees;
- consider protecting trees with hollows that are habitat for indigenous fauna;
- where necessary, rehabilitate areas as soon as possible after a fire or after undertaking fire management works;
- seek approvals and permits where required; and
- seek advice on how to improve environmental assets on your property.

b. Indigenous vegetation removal

Indigenous vegetation is an important asset on most rural properties. Sometimes indigenous vegetation needs to be managed or removed for fire safety reasons. In accordance with legislation, a planning permit is required to remove, lop or destroy indigenous vegetation unless an exemption applies.

c. Ecological burning

When used in appropriate cycles, fire is a powerful tool that can be used to promote the health of indigenous vegetation. This is called ecological burning.

6. Operating vehicles, machinery and equipment

Anyone operating vehicles, machinery and equipment has a responsibility to ensure that they do not start a fire.

a. Extreme fire danger days

Consider fire risk before harvesting, grinding and welding, slashing and mowing, or driving vehicles and motorbikes through dry grass or crop. Driving vehicles with catalytic converters through dry grass and crops is particularly hazardous.

b. Checking for fire risks

Anyone operating vehicles, machinery and equipment is encouraged to take regular breaks to check such items as straw or grass build-up and hot bearings and to regularly look behind for fire. Operators are encouraged to check that machinery and equipment will not start a fire before leaving them unattended.

c. Vehicles and motorbikes

Vehicles and motorbikes propelled with an internal combustion engine should not contact any type of vegetation during the Fire Danger Period (including days of Fire Ban) unless they are fitted with a system that takes all of the exhaust from the engine through the silencing system.

d. Machinery

Machinery incorporating a heat engine operating during the Fire Danger Period (including days of Total Fire Ban) in contact with, or within 9 m of, crop, grass, stubble, weeds, undergrowth or other vegetation must:

- be free from faults and defects that could cause fires;
- be fitted with a working and maintained appropriate spark arrestor (except if fitted with a turbocharger or an aspirated exhaust air cleaner); and
- carry a working water fire extinguisher or knapsack of at least 9 litres capacity.

In addition to water required under legislation, people are encouraged to carry a dry chemical fire extinguisher on machinery that is suitable for A class fires (normal combustible materials), B class fires (fuels and other flammable liquids) and electrical fires.

e. Equipment

Equipment incorporating non-vehicle heat engines should only be used in the open if it is fitted with a spark arrester, except if the equipment is being used to cut green vegetation. Non-vehicle heat engines operating in the open during the Fire Danger Period must also have:

- an area around the heat engine clear of flammable material for a radius of at least 3 m; or
- a person in attendance at all times the heat engine is operating;
- and they have a working water fire extinguisher or knapsack of at least 9 litres capacity.

While this equipment can be used on days of Total Fire Ban, consider postponing this work.

f. Cutting, welding and grinding equipment

Cutting, welding, soldering and grinding type of equipment can be used during the Fire Danger Period provided that:

- a fire-resistant shield or guard is placed to stop sparks and hot material;
- an area of at least 1.5 m from the operation is clear of flammable material or wet down enough to prevent the spread of fire;
- there is a water supply or an effective water knapsack of at least 9 litres capacity available for immediate use; and
- cut-offs and electrode stubs are placed directly in a fireproof container.

In accordance with legislation, cutting and welding equipment that produces fire and heat, such as welders, gas cutting, soldering, grinding or charring equipment, cannot be used on days of Total Fire Ban in the open air without a special permit obtained from LRFPA offices.

g. Grain harvesting

Harvesting is a high fire risk activity that requires particular care. As part of helping to protect the community from fire consider avoiding harvesting at times of extreme fire danger. Anyone harvesting is encouraged to have access to private fire fighting equipment during harvesting operations in addition to that required under legislation.

h. Hay cutting and carting

Consider the fire risk conditions present when cutting hay. Anyone carting hay is encouraged to have a fire-resistant cover on the load or have a spark shield behind the exhaust. Alternatively, have an exhaust system that is located under the body of the vehicle to ensure that the exhaust emissions are away from the hay.

i. Harvesting timber

In accordance with the forest practices for timber production, timber harvesting is required to be based on a timber harvesting plan. This plan may include fire protection restrictions. Consider scaling down harvesting operations when the Fire Danger Index increases above Yellow 55 in hilly country and above Orange 61 on flat land.

7. Using fire safely

Fire is a normal part of farming activities. The safe use of fire is encouraged.

a. Planning fire use

Before burning, anyone using fire is encouraged to:

- be clear about what the burning will achieve;
- identify risks and how they will be managed;
- ensure that weather conditions are and will remain safe for burning;
- have fire breaks to contain the fire;
- have sufficient resources on hand to control the fire;
- obtain permits / authorisation to burn and/or remove native vegetation where necessary;
- notify LRFPA and / or Firehawk and the LRFPA Fire Warden and neighbours if required, or if the burning may affect them; and
- seek advice on fire safety, flora and fauna, and weed management issues.

After using fire, people are encouraged to:

- check to ensure that the fire is completely out;
- monitor the site for fire over the next few days; and
- where necessary, rehabilitate the burn site or control lines as soon as practical.

It is an offence to intentionally or recklessly cause a fire and recklessly allow a fire to spread to vegetation on another person's property.

b. Smoke management

Anyone using fire is required to consult with the relevant road authority if the proposed burning may impact on road safety.

8. Fire use regulations

Regulations about the safe use of fire help keep the community safe from unplanned fire.

a. Fire Ban / Warning days

In accordance with legislation, where a Fire Ban / Fire Warning applies whether issued by the South African Weather Service or burning of any type is objected to by LRFPA, it is an offence to:

- light a fire in the open air;
- allow a fire in the open air to remain alight; or
- use or leave in operation any producer-gas equipment on or in connection with any vehicle.

b. Lighting a fire in the Fire Danger Period

In accordance with legislation, fires can only be lit

- with approval from LRFPA and / or Firehawk, and your Fire Warden and / or the LRFPO fire protection officer;
- the FDI rating permits, burning can take place; and
- a person is in attendance at all times while the fire is alight.

Anyone wishing to burn is required to notify Firehawk before undertaking the burning activity.

c. Burning rubbish in the Fire Danger Period

In accordance with legislation, a fire can only be lit in a registered incinerator (i.e registered with LRFPA) during the Fire Danger Period if:

- the fire is restricted to the incinerator;
- the air movement is no stronger than 10 kph;
- the area 5 m around and above the incinerator is cleared of flammable material;
- a supply of water sufficient to extinguish the fire is available; and
- a person is in attendance at all times while the fire is alight.

Burning rubbish cannot take place during the fire season – consideration should be given to alternatives, such as recycling or disposal at a registered landfill.

d. Lighting a fire outside the Fire Danger Period

In accordance with legislation, outside the Fire Danger Period a person must not:

- light or use fire in the open air or carry lighted flammable material that destroys, damages or endangers the life or property of others; or
- leave a fire in the open air that they have lit or are in charge of without leaving another person in charge of the fire, unless:
    - a landowner or occupier (or someone acting under their direction) is burning flammable material on their land; and
    - there is a firebreak of not less than 3 m and cleared of all flammable material around the perimeter of the area of land; and
    - at least 2 hours' notice is given to adjoining landowners or occupiers.

Anyone lighting a fire that is likely to come to the attention of Firehawk, is encouraged to notify LRFPA or Firehawk before undertaking the burning activity.

9. Fire prevention issues

Preventing fires starting is an important part of fire safety for individuals and the community.

a. Powerlines

Landowners and managers need to ensure that powerlines are maintained in sound condition and that they are clear of vegetation – in essence this will depend on the ESKOM servitude agreement.

b. Electric fencing

Electric fences can cause fires. This generally occurs when sparks jump from one wire to another in the presence of dry vegetation. Ensure electric fences are free of wire, grass, weeds and other vegetation. Operate electric fences according to manufacturers' advice. It is a common practice to switch off electric fences at times of extreme fire danger.

c. Dangerous goods

Landowners and managers are advised to store fuel and chemicals away from vegetation and key assets in tanks or containers that are in good condition. This will minimise the risk of fire starting in, or spreading from, these areas. Consider how fuel spillage can be controlled so that it does not pollute land or waterways. Consider minimising the risk associated with dangerous goods by minimising the amount of these items being stored on rural properties.

Turn gas supplies off if the property is threatened by a fire. Store and install gas cylinders in a protected location, upright on a firm surface with pressure relief valves (or venting valve) facing away from the house or building. Do not place any foreign materials such as wet blankets on or around gas cylinders.

d. Compost and manure

Landowners and managers are encouraged to manage compost and manure heaps to minimise the risk of fire. Manure and compost heaps may spontaneously ignite if they are large enough. Large lumps of dried manure can smoulder for several days. Consider harrowing manure across paddocks or removing manure prior to the Fire Danger Period.

e. Hay and silage storage

Landowners and managers are encouraged to store hay and silage:

- in a number of different places on the property rather than in one location to reduce the risk of losing all of their hay and silage in a fire;
- away from other key assets, such as sheds and powerlines, to reduce the impact of high fuel loads on these assets;
- away from roadsides that have a history of fire starts;
- away from vegetation that may be a source of embers; and
- in areas that are not likely to flood and in sheds that are in good repair so that the moisture content of the hay remains at safe levels.

Storing hay below 20% moisture content will help minimise the risk of haystack fires. To be safe, it is recommended that hay is stored between 12% and 18% moisture content. Consider using temporary fencing to allow stock to graze close to hay and silage stores to reduce fuel loads near these assets.

f. Fire safety policies

Consider having policies restricting public access to plantations and restricting such activities as smoking on or near plantations during the Fire Danger Period.

10. Reporting and extinguishing fires

a. Reporting and extinguishing fire

In accordance with legislation, during the Fire Danger Period owners, occupiers or managers of land must take all possible steps to extinguish fire on land under their management and inform LRFPA, a forest officer or police about the existence and location of the fire if they are unable to extinguish it.

Anyone finding a fire burning during the Fire Danger Period must report it as soon as possible.

11. Fire suppression

Having the capacity for a fast fire-suppression response is an important way to help protect properties from fire.

a. Private fire fighting equipment

Anyone operating vehicles, machinery and equipment is required to have some fire fighting equipment. In addition to this, landowners and managers are encouraged to have access to additional private fire fighting equipment to stop the spread of fire. This may range from such simple tools as rakes and shovels to fi e extinguishers, farm firefighting units, bakkie sakkies, or tankers depending on the type of fire risks present.

b. Response planning

Landowners and managers are encouraged to have a fire response plan for their property as part of an overall property fire plan.

c. Plantation Fire Crews

Plantation owners with an aggregate of more than 500 ha of plantation within a radius area of 25 km may be required to form a Plantation Brigade or form a partnership with other plantation owners to form such a brigade.

d. Preparedness and response plans

Plantation owners and managers are encouraged to have access to heavy equipment, such as bulldozers, graders and excavators, for fire fighting purposes. It is advised that this access be documented and that the range of equipment available can be scaled up or down as needed. Consider using early fire detection systems, such as lookouts and aerial and ground patrols. Seek advice for heli-dam requirements when planning to use helicopters for fire suppression.

12. Building and property access

Good building and property access for fire fighting is important for effective fire suppression.

a. Building and property access

Where practical, ensure that the property number is clearly visible at the property entrance for emergency services. Where practical and environmentally responsible, ensure that fire tankers can access each part of a property. This may not be practical in some terrain or with some blocks of native vegetation.

b. Access tracks

Generally, access tracks should:

- be free of overhanging trees and shrubs to a height of 4 m;
- be at least 7 m wide to allow two tankers to pass, or be 4 m wide and have passing bays every 200 m that are 6 m wide and 20 m long;
- have an average slope of no more than 1 in 7 (8.1 degrees) with a maximum grade of no more than 1 in 5 (11.3 degrees) for no more than 50 m;
- have dips with no more than 1 in 8 (7.1 degrees) entry and exit angles;
- be capable of a load limit of at least 15 tonnes;
- be aligned to provide straight through access at junctions; and

- be sign posted if visibility is poor due to terrain or vegetation.

Allow for, or manage, the growth of trees and branches when planning access tracks. Reducing adjacent fuel loads can increase the benefits and safety of access tracks. Consider the opportunity for access tracks to double as fuel breaks.

c. Gates

Gates need to be at least 3 m wide for tankers to fit through. Consider marking gates with a pole for easy identification if it is not obvious that a gate is present. Consider providing a gate into fenced-off areas of vegetation for fire fighting access and for access to manage these areas.

d. Woodlots, windbreaks and farm forestry

Providing good access around and within planted timber areas provides benefits for fire protection and access for general management and harvesting activities. Consider having access breaks, at least 4 m wide and free of overhanging trees to a height of 4 m, across long blocks of farm forestry, windbreaks or woodlots.

e. Crossings

All bridges, culverts and creek crossings need to have a load-bearing capacity of at least 15 tonnes where tanker fire suppression services are required.

f. Access in plantations

It is encouraged that each point within the plantation be no more than 300 m from an access track, perimeter break or open paddock. Wherever possible, plantation estates should be divided into blocks no greater than 400 ha by access tracks similar to perimeter breaks.

g. Raised beds

It can be difficult for fire fighting tankers to travel safely across raised beds. Landowners and managers with raised-bed crops are encouraged to have a perimeter access track or non-raised-bed section (headland) around the perimeter of raised-bed paddocks. This should generally be at least 7 m wide and free of overhanging trees to a height of 4 m to allow tanker access.

13. Water supply access

Access to water will assist in securing fi re safety.

a. Property water supply

Generally, water supplies should:

- be obvious to or known to local fire suppression services (signs or property plans may be necessary);
- be located in an open and clear fl at area with a hard standing area allowing a fire suppression pump to be within 4 m of the water supply;
- have a turning circle loop or turn-around point;
- where tanks are used, have couplings or adaptors that enable farm fire fighting equipment and fire services to fill from the tanks;
- be available even when water levels are low during winter months; and
- be independent of any mains power supply.

Water supplies could be from a dam, tank, mains water system, helicopter, or private water tanker. Bores and standpipes may also be suitable if flow rates are sufficient. Consider having a water supply and water distribution system that operates independently of mains power.

A suitable water supply may be available from a nearby property or water source with agreement from the relevant owner or manager.

b. Buildings water supply

To protect homes and sheds, landowners and managers are encouraged to have:

- at least 10 000 litres of water supply available for fire fighting that is independent of the reticulated water supply and mains power supply;
- options include having a dam, tank or pool;
- flame-resistant and heat-resistant or protected water supply pipes; and
- where tanks are used, couplings or adaptors that will allow fire tenders to be filled.
- Regularly maintain and annually check pumps and sprinklers to be used for fire protection.

c. LRFPA fittings for tanks

Forestry and commercial farming fire tenders use a special fitting to connect to tanks.

Consider using a 'tee' to allow the fitting on one side of the branch and personal fire fighting fittings on the other side of the pipe.

14. Community groups

While personal fire safety is an individual responsibility, fire safety is also an important community issue.

a. LRFPA

People living and working in rural areas are encouraged to join LRFPA to help improve fire safety on their property and in their community. Opportunities to discuss local fire issues, including fire safety and fire management of public land, are provided by LRFPA and DAFFF through a joint program called Working on Fire.

b. Other community groups

Other groups, such as local community, farm groups, and landowner associations will often provide opportunities for local communities to work together to improve fire management as part of caring for their local area. Other non-government organisations and wildlife rescue groups can provide opportunities for people to work together to help communities recover from the effects of fire.