



Fire Risk Management for Farm Forestry Plantations

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This Agriculture Note provides information on risk and hazard management for fire, methods of protecting farm forestry plantations from fire, and legal obligations for plantation owners.

Fire risk and farm forestry

In recent years there has been an increase in plantation establishment in many areas of Victoria, much of it by individual landowners previously unfamiliar with this enterprise. This increase in plantations on private land, typically ex-cropping or grazing land, has resulted in some increased apprehension about fire risk in rural Victoria.

The following facts are pertinent to the topic of fire risk in plantations:

- Most plantation fires start elsewhere and burn into the plantation.
- Whilst a plantation fire, once established, can be more intense, its rate of spread is usually much less than that of a grass fire under the same conditions.
- The high value of plantations necessitates good fire risk management by the owners.
- Large plantation owners have Forest Industry Brigades to reduce fire risk and to assist in fire suppression activities.

Fire risk management is about identifying and reducing fire hazards, then providing good access and resources for use should a fire occur. A lot of this work should be done during the planning phase before a plantation is even established.

Fire behaviour and plantations

Fire behaviour is generally described as the manner in which fuel ignites, how the flame develops and how the fire spreads.

Fire behaviour is determined by three main factors: **weather**, **topography** and **fuel**. While weather is out of our control, topography can sometimes be taken into account in plantation siting, and fuel can be manipulated in order to reduce the fire hazard posed by a farm forestry plantation.

The effect of **topography** is seen through both slope and aspect. Fire spreads far more quickly uphill than along flat land or downhill. For every increase of 10° in slope a fire will double its rate of spread travelling upslope. Northerly and westerly aspects receive the sun's greatest intensity and therefore fuels on these slopes are likely to be drier and more combustible than those on south or east-facing slopes. In addition, the north-west aspect is likely to experience the hottest and driest winds of summer, drying fuels out even further.

Fuel is that material which can be burnt by a fire. In a plantation, this includes needles, leaves, twigs, shrubs, weeds, bark, branches and trunks. The amount of **total** fuel tends to increase as a plantation gets older, but it is the amount of **available** fuel (that which can ignite and burn readily in a fire) which is critical to fire behaviour. In turn, it is the **arrangement**, **size** and **moisture content** of fuel which determine how available it is.

- **Fuel arrangement** refers to where the fuel is – on the ground or raised above it - and whether or not it is continuous along the ground and/or up into the trees.

- **Fuel size** is generally described as 'coarse' or 'fine'. Fine fuels (such as leaves & twigs) ignite easily and burn rapidly, but coarse fuels (eg: tree trunks & branches) burn for longer.

- **Fuel moisture** content is affected by the weather and whether the fuel is dead or alive. Topography and aspect also influence fuel dryness as noted above.

Thus the most hazardous situation for a plantation fire is where there are large quantities of fine, dry fuel which is more or less continuous on or near the ground, or up into the canopy.

A plantation in the path of a grass fire will almost certainly change the fire's behaviour and, as a result, can either help or hinder fire control efforts. Shading in established plantations helps to reduce ground fuel loads by limiting groundcover plant growth and helping to retain fuel moisture. Wind speed is also reduced due to sheltering effects.

These factors alone can be enough to stop a fire but the chances of success are greatly enhanced by the management measures referred to below.

If the fire does take hold in the plantation it is likely to become more intense as there is more total fuel.

Conversely, the rate of spread is likely to decrease, which may improve the chances of the fire being brought under control. In some instances, especially with Eucalypts, embers from tree crowns can cause spot fires, which will generally increase the rate of spread.

Planning for fire protection

Developing your Fire Risk Management Plan

In managing fire risk there is no substitute for good planning before a plantation is established but if it hasn't already been done, now is the best time to produce your **Plantation Fire Risk Management Plan**.

The Plan would include a physical plan of the plantation showing access tracks, waterpoints and turning areas as well as fuel-reduced and safe areas. It could be drawn on an overlay to an aerial photo or created through a computer mapping program. Details of strategic works and an on-going maintenance program are also essential parts of the Plan.

Siting your plantation

If siting options are available it is best to avoid land sloping to the north or west. If this land cannot be avoided it is safer for it to be contained *within* the plantation than in the north-west corner where a fire is most likely to approach from under extreme fire weather. Failing these two options, stricter standards of fire safety, such as wider fire breaks or greater fuel reduction, will be needed in this vulnerable sector.

Access tracks and firebreaks

The next important step in your plan is to ensure that a **perimeter access track** and **firebreak** is allowed for. The minimum width is generally 10 metres, though trees will need to be planted further than this from the boundary to allow for lateral branch growth unless the outside row is pruned. These breaks need to be trafficable to fire suppression vehicles travelling at 15 kph. Wherever possible, take advantage of existing fuel breaks such as roads, dams and creeks (don't forget to leave enough room next to the dam or creek for a fire vehicle).

In plantations less than 40ha in size a heavily grazed paddock beside a plantation may serve as a perimeter break so long as vehicle access around the plantation is not restricted.

In larger plantations **internal access tracks**, generally a minimum of 7m wide, should also be provided such that each 40ha of plantation can be circumnavigated.

Providing good access around and within a plantation isn't just good fire risk management; it's invaluable for general management, silviculture and harvesting.

Water supply

Water supply needs to be considered so that you can ensure adequate water will be available in the event of a fire. While this is often not a problem on farms where stock are generally catered for, ensuring **access** to it for fire trucks must be addressed.

Finishing your plan

Finally, **potential sources of ignition** should also be considered and noted on the Plan. For example proximity to roads, use and characteristics of adjacent land, and the degree of preparedness of neighbours can all affect the measures you need to take.

If your plantation is already established, it is still essential to prepare a plan although some options may be restricted.

Providing your local CFA with a copy of your completed Plantation Fire Risk Management Plan and talking to them about it, should help to ensure that what you have in place is adequate.

Fuel management

Fuel management is a vital aspect of ongoing fire risk management. It generally takes the form of **strategic fuel reduction** - removing or reducing fuel in the most vulnerable areas such as the north and west boundaries, or beside access tracks. It shouldn't be forgotten, however, that a fire can come from any direction so all plantation edges should have fuel management implemented.

Plantation managers need to be acutely aware of the changing fuel availability, and therefore fire hazard, as a plantation ages. For example the hazard posed by grass soon after establishment is quite different from that posed by thinning debris a few years later.

Fuel reduction techniques:

- **Slashing, ploughing and heavy grazing** of areas surrounding the plantation are all valuable measures.
- **Grazing** amongst trees once the plantation is established serves the double purpose of controlling weeds and undergrowth, and reducing available fuel.
- **Pruning** can help with fuel management by breaking the continuity between the litter and canopy. The first three rows around your plantation and either side of internal access tracks should be pruned at an early age to remove low branches. Remember however, that if pruning slash is not crushed, chipped or removed it has the opposite effect by adding substantially to the fine, dry ground-fuel load until it breaks down.
- **Mulching or chopper-rolling** of waste plant material after thinning, pruning or harvesting reduces its availability by keeping it low to the ground and hastening decomposition.
- **Removal** of pruning and thinning slash is the ultimate in fuel reduction in a plantation, but very costly. Consider stacking material from the first six rows (especially in fire-prone aspects) on the firebreak and burning it.

On-going fire risk management

While the suggestions for site selection and fuel control above demonstrate good plantation management in relation to fire risk, the **surrounding land** will also influence the fire risk to your plantation. If the land adjacent to your plantation is a fire hazard, keeping your plantation safe will be extremely difficult. Fire risk management is not just about reducing risk in localised areas, but relies on community support with widespread, responsible practice.

Producing a Fire Risk Management Plan in consultation with your local CFA brigade, (and DSE if you abut public land) and discussion with your neighbours, is an excellent start in broadening awareness.

Annual maintenance

The best fire protection plan can be rendered useless by just one year's unattended growth. Maintenance is imperative.

- Well before each fire season **assess** what works will be required to prepare for it.
- Major changes such as **pruning** or **thinning**, may require decisive action to address a sudden increase in risk.
- All perimeter firebreaks and internal access tracks must be **maintained** to keep them functional. This may involve spraying, slashing, ploughing or grading, as well as pruning of edge trees to ensure that track and break widths are maintained.
- Ensure that **sufficient water** is not only available but easily accessible.
- Ensure that all **machinery** and **equipment** to be used in the plantation during the fire danger period is properly equipped with spark arresters and fire extinguishers.
- Keep local CFA and neighbours apprised of your fire risk management activities.

Legal obligations

Plantation owners need to be aware of the legislation that relates to fire protection in their plantations. The *Planning and Environment Act 1987* requires compliance with the *Code of Practice for Timber Production 2007*. The Code states that "Plantation design must take account of environmental values, and be consistent with relevant fire protection requirements." Also under the Code, Timber Harvesting Plans must include "fire protection measures".

It is the duty of the plantation owner to maintain vegetation clearance around powerlines as a fire prevention strategy.

The *Country Fire Authority Act 1958* designates responsibility to the plantation owner to ensure that anything that may potentially pose a fire threat is

minimised. This includes the requirement to apply for permits to light fires and restrictions on the use of plantation management vehicles and equipment during the declared 'fire danger period'. It also imposes an obligation to establish and maintain strategic firebreaks. Plantations abutting public land may also be subject to fire-prevention obligations and fire-lighting restrictions under the *Forests Act 1958*.

Insurance

A standard plantation insurance policy will cover the plantation for fire damage from both internal and external sources. However, such policies are only available where good fire risk management is in place and certainly don't substitute for it.

Further information

On the Land: Agricultural fire management guidelines Country Fire Authority, May 2007.

This comprehensive but easy-to-use guide is an essential reference for all rural landholders and has specific advice for those involved in cropping, grazing and plantation enterprises.

To obtain your copy of *On the Land* visit your local CFA Region Office, phone 03 9262 8444 or check it online at the CFA website.

Wildfire and farm forestry - being prepared, learning from the past Information note by Virginia Forrest. Available from the DPI, Private Forestry website.

Code of Practice for timber production 2007, Department of Sustainability & Environment, March 2007

Guidelines for establishing & managing timber plantations in Victoria, including farm forestry Regional Plantation Committee, February 2000

Contact your local DPI Private Forestry Officer for further information or advice.

Websites:

www.dpi.vic.gov.au/privateforestry

www.dse.vic.gov.au/fires

www.cfa.vic.gov.au

This Information Note was originally developed by Virginia Harris and Frank Hirst and was previously published in December 2002.

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