

CHOOSING SUITABLE PLANTS

After planning and designing, the next task is to choose suitable plants for the garden. Some plants have intrinsic characteristics that reduce the likelihood of ignition. Choosing these plants and locating them correctly will help reduce bushfire risk within a garden.

There are a number of characteristics that influence how flammable a plant is. It is important to know which factors contribute to plant flammability. This will assist in making informed decisions when selecting plants for a garden.

A consistent approach for determining the flammability rating of a plant is provided by the Plant Selection Key (see Section 7).

The key takes the user through a series of questions about the characteristics of the plant and provides:

- an overall flammability rating
- firewise rating
- maintenance requirements
- advice on where to locate that plant within a garden.

Before working through the key, there are elements of plant flammability that should be further explained.

PLANT FLAMMABILITY

Determining the flammability of plants is not straightforward. Although it can be tested under controlled circumstances in a laboratory, the flammability of a plant may vary in a bushfire, where the conditions are often unpredictable. Some plants are more flammable than others but all plants in a garden – living and dead – can provide fuel for a bushfire.

Plant flammability is described as a combination of:

- the time taken for a plant to ignite
- how readily it burns when the ignition source is removed
- how much material there is to burn
- how long it takes for all available fuel to be consumed.

Flammability will vary depending on:

- a plant's age, health, physical structure and chemical content

- the daily and seasonal climatic variations
- location of the plant in relation to other vegetation and flammable objects
- the specific part of a plant – some parts of plants are also more flammable than others.

PLANT MOISTURE CONTENT

Foliage moisture content is the most critical factor that determines plant flammability. It influences how readily a plant will ignite.

Plants with high foliage moisture content will not burn until sufficient moisture in its foliage has been removed.

Plants with low moisture content will ignite more rapidly and continue to burn when the ignition source is removed.

Plants in the path of an oncoming bushfire will dry out as a result of the radiant heat and wind generated by the fire. Even fully hydrated plants will eventually dry out and burn if they are exposed to bushfire heat for long enough.



This succulent ground cover has a high moisture content.

REMEMBER

The arrangement of vegetation within a garden, rather than the flammability of individual plants, has a greater impact on how a bushfire will spread.



Thick, succulent leaves



Soft, fleshy leaves

Moisture content depends on a number of interacting factors:

The time of day

- Before sunrise, plants will typically have their maximum moisture content (influenced by the moisture content of the soil and humidity).
- As they transpire during the day their foliage moisture content decreases until the plant stops transpiring after sunset.
- Generally plants are most flammable in the mid- to late-afternoon when their foliage moisture content is at its lowest.

The season

- During summer as the soil dries out, the moisture content of the plant will decrease and the flammability of the plant will increase.

The part of the plant

- The leaves and new growth on a plant will generally have a higher moisture content than the stems or branches.
- Dead leaves and twigs have a very low moisture content that is driven by the relative humidity. On hot, dry days they become highly flammable as fine fuels.

Where it is planted

- The amount of sun or shade, the availability of water, drainage and soil type will affect plant moisture content.

Environmental conditions

- High temperatures, low humidity and periods of drought will increase the flammability of plants.

The age of the plant and its growth stage

- Many plants start as moisture-rich shoots but become woody as they age. As plants approach the end of their life they tend to dry out.
 - New growth on a plant will usually be soft and fleshy and become woody after the growing season.
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ENVIRONMENTAL WEEDS

In most high bushfire risk areas, houses are located in close proximity to unmanaged vegetation. Some popular garden plants have become environmental weeds by escaping to the bush and displacing native species. Environmental weeds often contribute to high fuel loads, which increases bushfire risk. Priority should be given to removing environmental weeds within the property.

Avoid planting environmental weeds. Contact local council to find out which weed species are a problem in the area. The Department of Primary Industries also has information about weed species at dpi.vic.gov.au

When selecting plants, consider using local native species with low flammability. These are well suited to local conditions and will add to the habitat value of the bushland.

CHARACTERISTICS

The following plant characteristics are used throughout the Plant Selection Key. They all contribute to plant flammability to varying degrees and should not be considered in isolation.

BRANCHING PATTERN

This influences the distribution and density of foliage within the plant.



- Choose plants with open and loose branching as well as leaves that are thinly spread.



- Plants with closely packed leaves and branches have more fuel available within the plant and are usually more flammable.



- Plants with branches at least 2 metres above the ground are better than those with continuous foliage from the ground to the canopy. Under-pruning increases separation.



- Separation between ground fuel and foliage on the rest of the plant prevents lower branches acting as ladder fuels.

TEXTURE

This describes the overall appearance of the plant.

In coarse textured plants, it is easy to distinguish each branch or leaf from a distance of 3 metres.

Plants with a coarse texture have a lower surface-area-to-volume ratio making them less flammable than plants with a fine texture.



➤ Coarse textured plants



➤ Medium textured plants



➤ Fine textured plants

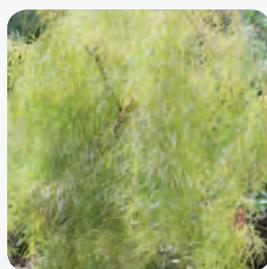


DENSITY

This describes the amount and arrangement of fuel within the plant.

A dense plant is difficult to place a hand into and is not easy to see through.

Plants that are very dense are often more flammable as there is a higher fuel load readily available to burn.



➤ Very dense



➤ Moderately dense



➤ Sparsely dense

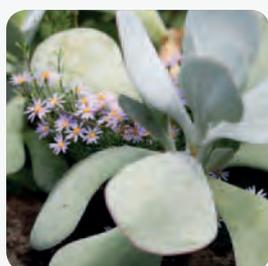
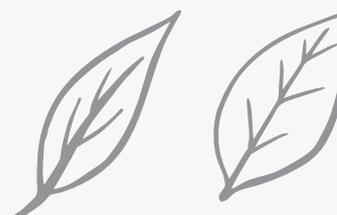


LEAVES

The fineness, size and shape of leaves affect their flammability.



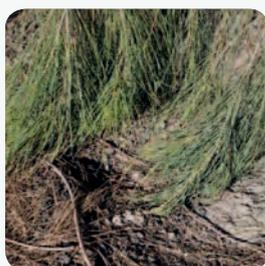
- Wide, flat and thicker leaves (such as those on maples, camellias and oaks) and those that are soft and fleshy have more plant tissue in their leaves. This usually means a higher moisture content relative to their surface area.



- Leaves with a high moisture content take longer to dry out and therefore longer to catch fire.



- Small, thin and narrow leaves have a high surface-area-to-volume ratio, which tends to make them more susceptible to drying out.
- Generally, the higher the surface-area-to-volume ratio, the more flammable a leaf will be. Some plants with high surface-area-to-volume have leaves with high levels of oils (such as paperbark, tea trees, eucalypts) or resins (conifers such as pine trees). These combined properties increase flammability.



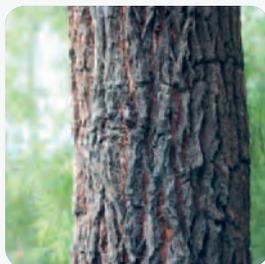
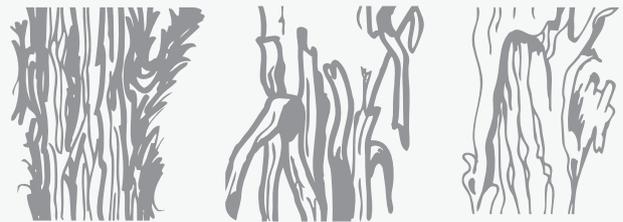
- The shape of leaves influences how easily they are caught in vegetation when they fall off the plant. If leaves are caught within plants it will increase that plant's flammability as leaf litter dries out and ignites readily. Dead pine needles are a good example of leaves that readily catch in other plants.

BARK TYPE

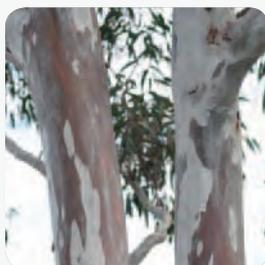
Some bark types ignite more readily than others.



- Bark that is loose, stringy or fibrous will ignite easily and can break off to create burning embers that are carried ahead of a bushfire.
- These types of bark can also act as ladder fuels that carry fire into the canopy of a tree, increasing the intensity of the fire. Examples of such plants include stringybark eucalypts and some paperbarks.



- Bark that is attached tightly to the trunk or is smooth is usually less flammable because it is more difficult to ignite and will not be easily carried as an ember, for example Box Barks.



- However, some smooth-barked trees shed their bark annually and trap large ribbons of bark in their branches or on the ground below. These ribbons of bark are highly flammable, can be carried as embers and can also act as a ladder fuel, for example Manna Gums.

OILS, WAXES AND RESINS

Some chemicals that are found naturally in plants will increase their flammability.

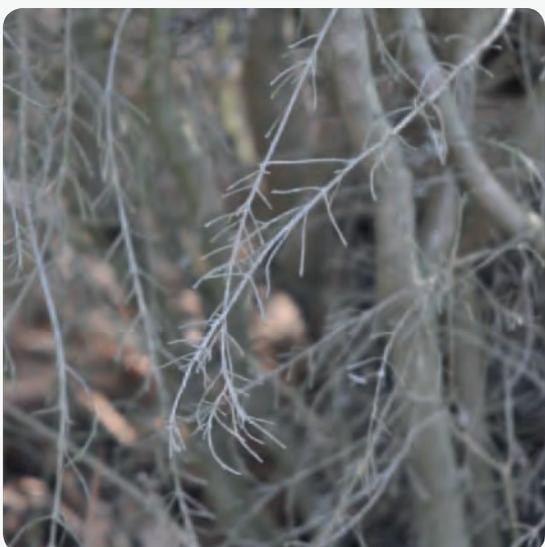
The leaves of plants containing significant amounts of oils, waxes and resins will often have a strong scent when crushed. For example rosemary, lavender and eucalyptus have oil in their foliage and pines can have high resin content.



- Waxes and resins have a similar effect of increasing flammability of plants although there are a number of characteristics that contribute to the overall flammability of a plant.
- Plants with high amounts of resins or oils should be limited and placed carefully within a garden.



RETENTION OF DEAD MATERIAL



- Dead leaves, twigs, bark and branches that are retained on the plant or accumulate on the ground or in shrubs can increase the flammability of an otherwise firewise plant.
- Regular pruning and maintenance of all trees and shrubs to remove these fine fuels is necessary.