



## **Your vegetation – what you need to know**

Chair: Malcolm Hackett OAM

Panel members:      Dr Kevin Tolhurst AM  
                                 Dr Justin Leonard  
                                 Dr Peter Ashton  
                                 Nick Guyett

### **Chair**

Rohan please show the results of poll number one

Kevin have you got any comments?

### **Kevin Tolhurst**

I'm not surprised that windows and decking come up as highest in terms of building elements that would be most affected. But really the subfloor and electrical and gas connections too, they're all important. The point is that any fuel within a couple of metres of your house is problematic so it doesn't really matter in a way whether your windows break or your decking catches alight it's going to make it really hard to defend your house. It's good that people are recognizing that windows and decks are key elements. Justin would be in a much better place to give you the statistics or the relativity of those. But I think it's really important to appreciate that fuel close to your house is such a critical component to threatening the integrity of your property.

### **Justin Leonard**

I guess the poll really has all those elements that are potentially at risk. And I guess every house isn't created equal so I'd expect to see a really good spread about where the relative weaknesses are for a diverse range of houses. I'd say windows and decking do come up all the time but if you do have a raised subfloor house that isn't fully enclosed that's easily as susceptible as a deck to that vegetation and vegetation attack. So, it's really about casting a really keen eye on to any of those elements that are proximal. Because the fire will exploit and find those weakest elements and they're basically starting checklists and things to work through.

### **Peter Ashton**

Those things are clear to most of us and I guess going back to what Kevin said it's like the whole package needs to be thought about. And the weakest link needs to be thought about as well.

### **Chair**

How do you actually remove the fibrous bark from a tree trunk?

### **Kevin Tolhurst**

The worst trees in terms of their ember production are the stringybark trees - the rough fibrous bark trees.

One way is when the ground's wet and everything is wet after a sunny day you can actually light up individual trees. It's called candling. Let the fire remove the bark off the trees, It may actually reach further up the tree and it removes the loosest part of the bark, the most flammable part of the bark.

But you'd want to be a little careful about doing that of course to make sure that nothing else is going to catch alight around you.

You can remove bark with something like a rake and get rid of the furrowed part of the bark to get it back to a fairly tightly held bark and that would significantly reduce the fuel and reduce the number of embers. Using a rake or physically stripping the rough bark off doesn't leave you with a black stem but it is certainly worthwhile doing that.

But you've got to also consider what's happening in the broader landscape several hundred metres away from you in terms of the amount of bark that you would get from there. But certainly, it's worthwhile removing it in the vicinity of your house. Justin might provide some detail on that as well in terms of house ignition from bark close to buildings.

### **Justin Leonard**

Ember ignition risk and ember loads that our house experience decay rapidly with distance from the source. The wrong type of bark on trees like Kevin described close to houses is going to be a direct problem. The long-term solution is ideally, as those plants mature and may need to be replaced, think about replacing them with low flammability bark eucalypts or maybe non natives. Certainly those actions Kevin described are key.

I think the other silver bullet to solving the ember problem is to not have elements around the house that are ember susceptible. It's a bit of a folly to think you can completely remove embers as a source from the landscape. But we can approach the ideal situation which is having a house that can withstand a barrage of embers.

### **Chair**

Do deciduous English or European trees provide ember risk reduction? This person's noted that investigations in Kinglake suggest that English oaks actually protected houses and I think you've touched on that Kevin, but is there anything additional you'd want to say?

### **Kevin Tolhurst**

When you look at a lot of European-type trees they've got hard bark, not fibrous bark. Something like an oak the bark doesn't burn that readily and it's not producing embers. So, it's quite different to a stringybark eucalypt for example.

Elm trees, fruit trees, there are lots of different sorts of trees and even a lot of conifers. But then the conifer has the disadvantage of flammable leaves. Deciduous trees have both low flammability leaves as well as really low flammability bark. So you're getting rid of the ember problem as well as reducing the chance of having canopy fires and the like.

You may not necessarily want exotics. That's where a lot of the work has been done around the place including down the South Coast looking at trees or plants which are endemic but are of the lower flammability type. You're better off in a neighbourhood to be able to increase those lower flammability plants in a neighbourhood or at least on your own property but preferably in a neighbourhood to reduce the overall risk. Exotics are one solution but that's not necessarily going to suit everyone who's living in an environment, they want to have an Australian native environment if you like. Certainly, the exotics are good.

### **Chair**

Hedges can act as an effective wind break, but they can also act as fuel. How do you reconcile that to reduce the risk?

## **Justin Leonard**

The distance the hedge is from the house is obviously a primary concern. If it flared do you have a direct radiant heat and flame contact risk? So, you'd want it a fair way away.

Something to consider is there's problematic hedges but then there's potentially hedges that use specific species and are maintained in a certain way that they're going to not burn anywhere near as aggressively as other types of hedge. So go through the whole hedge selection process and the structural assessment things that Kevin articulated.

I guess you know timber fences are similar. They can attenuate some wind and block some radiant heat. But at the same time, they can be activated and be fuel sources themselves. So, it's definitely worth considering both the pros and cons when you're thinking about each of those elements.

## **Kevin Tolhurst**

One of the things about a hedge for example is it's connectivity. So rather than having a perimeter hedge that's basically continuous around your property for example just having smaller sections of hedge if you like and then intersperse it with other plants within your property so that you don't have that continuity, is one way of getting over it.

Hedges that are trimmed are a problem because it increases the connectivity within the plant which makes them more flammable.

Both dispersing the planting but also dispersing the branch and leaf structure within the plant is something that you ought to aim for. You still get the wind reduction and the ember production and the shading effects but you're not increasing the flammability unnecessarily.

## **Nick Guyett**

A solution that we've found is to cut out say every second or third plant of the hedge and replace it with a screening non-combustible panel. So you still get that shade but you break up the connectivity really effectively.

## **Chair**

Can you talk about the risks of having grape vines on pergolas to keep the hot summer sun out.

## **Justin Leonard**

A grape vine isn't what we call a highly problematic vegetation type, but it does have some degree of bark. And I guess year on year the leaves do fall and so they'll lodge into little crevices and whatnot. When the ember storms come they could exploit and find aspects of that grapevine that could have small flame sources. I think the takeaway is that the grapevine isn't going to go off really aggressively but it is adding a small degree of additional fuel load to structure.

If you're going to take that type of approach be very careful about what you choose as the support structure for that grapevine. Don't use treated pine, go for metal frameworks and processes and be quite careful about the eave design and the walls and the elements of the house that are connected or intimate with the vine because it's going to have to put up with some low intensity flame attack which is often the way houses are initially ignited - from a very small attack. A house that's resistant to that is going to be okay.

A really practical way of shading and retaining moisture in the landscape and keeping some heat off your house, but think about it as a small flame source.

## **Kevin Tolhurst**

To continue on from what Justin's saying is it's often the dead material in these plants that are a problem. Whether it's dead bark or it's dead leaves that are held on the plant that provide fuel to spread the fire.

I tried to demonstrate that a little with the Pencil Cypress. That was an extreme case. Or the gorse. If you actually trim the dead material out a lot of plants significantly reduces their flammability. When they're young there's not much dead material there. But as they get older you need to be pruning out the dead material and need to be very cautious about pruning them to shape like topiary if you like because that actually helps contain the fuel within inside it. It's not necessarily visible but it's there.

If there is dead materials there embers will find it. Pruning to remove dead material is really quite important to lower the flammability of that vegetation.

And it's one of the things in that overall fuel hazard guide that is important - the percentage of dead material in the structure of the plant dramatically changes the flammability. We see it in grass when we talk about grass curing. When it's 50% cured, so half dead half live, it will burn reasonably well. When it gets to closer to 90 or 100% cured where it's mostly dead and very little live, it'll burn very readily. But when it's closer to only 10 or 20% cured basically it won't carry a fire.

The amount of plant material and the proportion of dead to live dramatically changes the flammability and that goes just as much for shrubs, trees and grape vines for that matter as it does for grass.

### **Chair**

Say you've got a shrub, it's close to the house and you really love it. Will sprinklers on vegetation stop them from catching fire?

### **Kevin Tolhurst**

The trouble is have you got enough water and can you keep it wet under those really windy extreme heat conditions.

### **Justin Leomard**

It's really a case of the bigger the plant or the finer dead fuel on it the more water and the more frequently you're going to have to wet and re-wet. The fine fuels under those really hot dry days take a surprisingly short amount of time to dry out.

We're talking about comprehensive water coverage and quite frequent re-wetting. So, if you're not really re-dousing the plan every 5 to 10 minutes it's quite possible that the finest fuels in that structure could dry out.

Those fine fuels could activate, and I guess the initial torching of those fine fuels can drive off a bit more residual moisture in the rest of the fine fuels and it can burn maybe not as severely as a completely dry starting point but could burn to completion and provide some problems.

It's probably a little bit of a stretch to say we really want a hedge right up against our house and I'm going to use water as the solution. You'd really want to think about that reliability and redundancy of being able to really keep that thing dry and of course have a water system that's reliable enough to get you through the entire fire event as well.

### **Chair**

Why do fire departments use prescribed burning when after about three years the regrowth is much thicker than before the burn? In our forests they only promote ladder plants.

## **Peter Ashton**

That definitely does happen in some vegetation types in some places in our forest but not the whole lot. So that might come back in three years, but what you have actually done in your prescribed burning is taken off that bark that has an impact downstream with embers. That persists for quite a while. You've also taken a lot of that dead material that's been building up over many years out of the system. That takes a long time to come back as well.

You do have benefits that persist much longer than three years. But I would also say if that's in an area that's really important to the town and that particular parcel will have impact then as a community we need to look at potentially bringing that round more often. And what you'll find generally the woody, the hard seeded shrubs which generally make that thickening happen, start to thin out over time. So that might be something that needs to be thought about for some areas.

In other areas you might not worry about it as much, but you'll take the benefits from the bark and the dead fuel.

## **Kevin Tolhurst**

Prescribed burning doesn't have to result in thicker vegetation. As Peter says if you do very frequent low intensity fire it can basically do the reverse. It can actually thin that vegetation out. What you want to avoid is say every 10 or 15 years having a fairly hot fire because that will promote the shrubbery understory so that can be counterproductive to some extent.

It's not a problem with the prescribed burning per se but how it is carried out. If you think of it in the way that there's energy being released in that burning processes, that's energy that's not there next time when high intensity fire comes through. So, you have removed some of that energy from the system. And the regrowth has very little dead material in it, so it won't burn as fiercely to start with. But the fires really perhaps need to be quite frequent as Peter was saying in some of these areas to change the structure in the first place to get it to a more manageable level.

## **Nick Guyett**

To highlight an example Peter mentioned if there's a place close to town seen to hold a lot of value that prevents a whole change of vegetation type. Cutting out some of those shrubs to start with can have that immediate impact. Cutting them out removing them and then that low intensity burn can certainly help even further.

## **Chair**

Do all eucalypts have roughly equal high level of flammability, oils and resins, or are some eucalypts safer than others?

## **Kevin Tolhurst**

No, they're not all equal. Things like peppermints and blue gums for example have relatively high oil content. They don't have resins, but they have relatively high oil content.

And then they've got some species like spotted gum which you find more off the East Coast has very low oil content.

You can choose eucalypt species with greater or lesser oil content and the trick is to basically grab the leaves, crush them and see how strong the smell is. Any leaf, whether it's a eucalypt or not, if you get a strong smell from crushing the leaf in your hand then there's a fair chance it's got a high level of resins, oils or waxes in them that's providing that smell. So, it's not just eucalypts. It's other species as well. So that's a good test to see how flammable it might be.

What happens with those oils is they might only be 2% of the content but they can double the size of the flames that you get from that vegetation. Typically from a lot of vegetation the flames will be about twice the height of the vegetation. If you've got those oils and resins in leaves then it can be three to four times the height of the vegetation a dramatic increase in the length of flame. And that then tells you how far away you need to be from those vegetations if you want to avoid the flame contact.

## **Chair**

The chart that you showed us indicates that 50% of people killed by bushfire die within 50 metres of their home. Does vegetation play a part in it?

## **Justin Leonard**

That was all fatalities outside. It's not counting the people inside the house.

People caught outside over 60% were within 100m. And it's something like 50% within 50m.

The specific vegetation and the role of the vegetation immediately around the house is absolutely pivotal. We need to think about contingencies that if the house burns down do you have a safe place to move out into an open area free of these fuels both heavy and fine?

I think it really puts an important context under the real role of vegetation management. It's not just about a house bushfire interaction, it's about safe places and backup plans for people if they're caught in these situations.

## **Chair**

The big take-home for me was that notion that people working together can make a difference in their immediate locality.