

## Topic 13 Sprinkler Systems

Operation, supply lines,  
standpipes, mops, hoses,  
retardants



Chair: Malcolm Hackett OAM

Presenter: Dr Justin Leonard

### Chair

We've got a question here about during a long hot summer, water supplies are often low. At what point in the fire do I obtain maximum benefit from having sprinklers on, and should there be pauses during the sprinkler use?

### Justin Leonard

I guess that comes down to the specific thing you're using the spray systems for. We went through in the beginning of the seminar what you're really targeting the spray system to do. If it's to protect your windows from radiant heat, you're in the peak of the fire, well, you need them on for the whole duration of that peak. If you're trying to prevent your deck from igniting from the ember onslaught, well, you need to intermittently wet that deck during and for hours after the event, possibly through the night. It really comes down to exactly what the purpose of the spray system, and what it's trying to protect, will dictate exactly how it needs to operate to minimize the water use and achieve the outcome.

### Chair

Here's a home where there's vegetation 1-3m high, 15m from the house. Is wetting that down before a fire reduce the impact when it hits that vegetation?

### Justin Leonard

It really comes down to how wet it is at the time the fire turns up. So, if you try to imagine a Black Saturday condition and wetting out an elevated hedge or something like that, try to imagine how quickly that'll return to being dry again. Like, we're talking 5% relative humidity, 60km/hr winds and 40° heat. It's not going to be that long after you wet that vegetation down before it's back to its dry state. So, it really comes down to wetting it down immediately before or during the fire event.

### Chair

If you were to install a poly pipe below the ground to connect to your tanks and supply your sprinklers on metal rises. How deep should the poly be buried?

### Justin Leonard

We've found that once you get around 10 centimetres below the ground, the temperatures are not adequate to melt poly in the ground except in the event that you put a significant fuel load on the ground itself. So, if you had a vehicle that burned or a pile of wood or a fence burnt above along that line and it was only 100mm below ground, then you might have enough heat. But the typical fine burning of things above ground is not enough to affect things. So yeah, minimum 100mm. There's a difference in certain soils and what not as well but, as a rule, at least 100mm below the ground, unless you're going past something quite significant, then you must go a lot deeper.

## **Chair**

I can add an anecdote to this from Black Saturday. Our supply came from a dam above the house, and the poly had been put in some years ago and it weaved its way between pine trees. The roots of the pine trees caught fire, the poly pipe was about 200mm in the ground, and it put holes in the poly pipe. So, I'd be urging people to go as deep as you can and stay away from other stuff.

## **Justin Leonard**

And that's probably a really pertinent example, because it's poly pipe, full of water pressurized by a tank, and the water pressure wouldn't have let up but it still melted through the poly. So, you just can't rely on plastic hoses even if there's water or flowing water inside them. They can burn through.

## **Chair**

Can rigid plastic poly pipe be used for sprinklers as long as there's water in them? So, there you've just answered that question

## **Justin Leonard**

Solved that one

## **Chair**

Getting back to our sprinkler systems again, this participant was told that the copper sprinkler piping is unsuitable for bushfires. Will copper withstand the radiant heat and flames?

## **Justin Leonard**

I found copper, and particularly copper with water in it, survives adequately in bushfires. So, I would challenge that as a suggestion.

## **Justin Leonard**

And onto pipes and spray heads. So, anything above ground, I would say metal is the way to go. You can go with the galvanized pipe approach, although the downside of that is they rust over time and end up choking up that pipe diameter during that life, and that all comes down to soil type, water quality and whatnot that's inside the pipes. I would say copper is really reliable, and I would put copper standpipes coming out of the ground with no problem. I've seen really reliable systems with copper exposed to direct flame contact and it's fine.

I would err against using timber, even if it's hardwood as the backing post, like in this example. Especially not treated pine. Preferably not hardwood, more like a steel support backing pipe for your standpipes would be more appropriate. I like this design in that it's got like an all-metal impact sprinkler on the top, and I guess you probably wouldn't expect these plastic fittings to potentially be there if there was a significant heat source nearby

## **Justin Leonard**

There's other types of sprinklers that are more dispersive sprinklers. This is the example that's actually on the top of that pumping shelter. And what you really find is this is a really fine dispersive sprinkler, so under really windy conditions this is going to have most of the water carried away from the area, rather than deluge back onto that shelter or its immediate environment. And, yeah, you certainly can't rely on that type of spray system to be persistent in that particular area, and you can't rely on that preventing embers getting to your pump approach. So, I'd I think probably differently about a more effective way to get water onto that system.

The particular standpipes and the way they're protected is key. Even the threaded fittings between them, you really have to focus that on an all-metal approach.

### **Chair**

Is it okay to fill garbage bins with water and have a mop handy, and to put them around the house? And are plastic hoses okay?

### **Justin Leonard**

The old knapsack and mops are an extremely effective way to put out a lot of ignitions with very little water. And I think in observing the realities that the power shuts off and your mains water supply dwindles to nothing, and you're left with what's in your tanks, and what you can get out of your tanks, and what you've already filled up your rubbish bins and your bathtubs with, it really does come down to those being very effective strategies to get by. Particularly around that constant onslaught of embers and continued ignitions in the many hours after the event itself, when it has reached a point where it's safe enough to move outside and continue that defence.

Plastic hoses invariably are burnt out and useless if they were out during the fire event itself. So, the surface fires that sweep through take them out. They could be pressurized typical plastic garden hoses, or they could be empty of water or not pressurized. They actually just fail when the surface fires come through and impact them.

### **Chair**

Do you know if there's any non-flammable fire hoses for domestic use?

### **Justin Leonard**

The typical roll flat hoses are flammable. They're made of a natural fibre. I'm not aware of a completely inflammable one though.

### **Chair**

And this question also asked whether they should be kept on, do you bring your hoses inside until you're going to use them?

### **Justin Leonard**

I guess you do. If they're dry they obviously can burn through. But, correct me if I'm wrong, I guess it's a good one for the fire fighters. Those natural fibre hoses, when charged and wet, tend to be able to handle spotting and a bit of surface fire activity and don't burn through like a typical garden hose.

### **Chair**

And I notice here on the Q&A feed that a volunteer fire fighter says the traditional canvas hoses will hold moisture and they're only likely to burn when they're subject to prolonged flame. So, your beliefs there look like they were spot on.

## **Chair**

Now, what about these fire retardants that you can apply? Is it worth spending the money on fire retardants, or you go out and buy a better pump and generator and so on?

## **Justin Leonard**

Yeah, I guess that's referring to the hydrating gels and things that you could possibly spray over everything as a preventative. Well, they're a hydrated gel, and the gel itself, before you hydrate it, is possibly a vegetable oil based hydrating gel, or a slightly different type. Once they dry out, they're no longer effective, and in the case that they're vegetable oil based, they dry out and then you basically have a house covered in vegetable oil, which isn't that ideal in a fire event. So, it's really down to how much you get on, how thick it is, and how much it dries up during the event. And if applied the right way, and are thick enough, and they're done in a short enough duration before the fire event then sure, they might protect the elements you've put them on.

The problem with them are numerous, in that once you've put them on it's very difficult to get them back off, particularly in the event that they get baked on in situ. So, if you're going to invest in one of those approaches, you would look for the evidence of specifically how easy it is to get it back off and how benign for the environment it is. And, of course, there's obviously the other side effect that you're going to get it everywhere and it's going to be slippery. So, there could be some slips and trips issues.