

# How climate change is affecting gardens

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According to Dr. Dave Kendal from the University of Tasmania, in the next 50 years, 20-50% of current plant species in botanic gardens and urban landscapes will likely confront temperatures those species have never experienced before.

Last month, as the State closed on [one of its hottest and driest years on record](#), a giant White Oak (*Quercus alba*), that had stood for over 150 years on the famous Oak Lawn at Royal Botanic Gardens Victoria, simply collapsed, leaving a gaping hole in the City's most iconic landscape.

The much loved tree, thought to have been part of the 1862 planting of oaks in and near the Gardens, had shown signs of stress during routine monitoring by the Arboriculture team in the days leading up to the collapse. Urgent expert assessments were made to see if it was possible to save it.

"We investigated every option possible to save it, but in the end the damage and stress was simply too extensive."

The tree was fenced for the safety of the more than 5,000 visitors who come to the Gardens every day, until further tests could be completed. Sadly, later that week a major limb failed completely. It crashed to the ground within the fence, leaving a swathe of debris and leaves across the lawn.

"We haven't removed it entirely yet," says Professor Tim Entwisle, Director and Chief Executive, RBGV. "We are going to leave the major branches there for a while, giving everyone a chance to say goodbye and as we look at ways to give some of the wood a second life."

"We are not sure yet of the cause of its demise, but it likely to be a mix of old age, droughts, winds and [climate change](#). While this species lives to 300 years or more in natural habitat of eastern and central North America, in the warmer Melbourne [climate](#) oaks and elms grow twice as fast and can senesce at younger age. But that's only part of the story."

"Melbourne has experienced many hot summers over the past few

decades, and the millennial drought, in particular, took many of Melbourne's historic streetscape trees with it," says Professor Entwisle. "Climate change is a threat to plant and human life, and already it is changing what we can grow in our streets, parks and gardens."

In 2017, Royal Botanic Gardens Victoria took action to mitigate the impact of climate change on its stunning landscape and important plant collections. The organisation commissioned an assessment of nearly three-quarters of its living collections, testing their viability and likely survival in Melbourne's predicted climate for 2090. That is, hotter and drier, more like Dubbo in New South Wales or overseas, Algiers (in Algeria) and Tijuana (in Mexico).

What they discovered was shocking.

"Over a quarter of plant species at Royal Botanic Gardens Victoria were rated as a high risk of not surviving in the Melbourne climate of 2090. And remember, many of the trees we plant today we expect to live for 100 or more years" says Professor Entwisle. "We were so shocked, we immediately set up a way to share our findings with the rest of the world's [botanic gardens](#), so we could work together to help each other prevent mass losses from our collections."

In December 2018, RBGV brought 10 botanic gardens and 3 national and international [garden](#) networks, from around the world together to create the [Climate Change Alliance of Botanic Gardens](#), a network dedicated to responding to the global impacts of climate change in botanic gardens. Since that time the number has grown to 50 international member gardens.

"It is the responsibility of botanic gardens around the world to lead our response to the now unavoidable consequences of climate change. To review what we grow, offer solutions to governments and adapt our

cultural landscapes. In some cases this means changing the plants we grow and learning new horticultural techniques." said Professor Entwisle.

As it celebrates its first anniversary, the alliance has many achievements already, including a prototype climate risk assessment tool to help manage plant collections and landscapes.

[The Royal Botanic Gardens Victoria's Landscape Succession Strategy](#), our blueprint for adapting Melbourne Gardens to climate change, is the first of its kind for any botanic garden and is set to become a blueprint for others.

This strategy guides the transition of the Melbourne Gardens from existing plantings to a collection better suited to the projected climate and environmental conditions of 2090, preserving one of the world's most beautiful botanic gardens for future generations to enjoy.

By joining the Climate Change Alliance of Botanic Gardens, members have access to a global network of scientists, horticulturists and other experts, all working together to protect their Gardens and the plants of the world.

"If our botanic gardens are to do what we want them to do—to change the world, to connect people to nature, to inspire and transform—we must plan for the succession of our landscape," says Professor Entwisle. "Together, we are a powerful voice for change and clearly, the time for action is now."

So would Guilfoyle, the Landscape Designer behind the Garden's current layout, have planted a White Oak (*Quercus alba*) if he had been aware of the today's climate forecast?

"A White Oak is native to eastern and central North America, to regions where the average temperature is much cooler than Melbourne's is likely to be in a few decades," says Professor Entwisle. "So, if he had access to the information we have today and our Landscape Succession Strategy, I would say no, he would have selected a different oak species or perhaps even a local River Red Gum (*Eucalyptus camaldulensis*)."

Provided by Victorian Government

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