What is it?
Climate ready plant selection to enable resilient urban landscapes

Why do we need it?
Our climate is changing and some species that have worked in the past may not work in the future
Globally our cities are heating up and rainfall patterns are shifting.

We are experiencing longer and hotter and more frequent heat waves.

Urban areas are most at risk due to urban heat island effect.

Climate change
Based on RCP 8.5 projections (worst case scenario)
Australian cities

Based on RCP 8.5 projections (worst case scenario)
What is the impact of heat on our urban forests?

Field study of 5500 existing street trees (Penrith area) during the 2019-2020 heat wave

Study: Tabassum et al., 2021
Over 10% of street trees experienced critical leaf damage.

Choosing climate ready species will be key to ensure our urban forests are resilient to climate change.

Extreme temperature results in leaf scorch.
Module One
Species attributes

Module Two
Success and failures Living Labs

Module Three
Heat and drought tolerance
We collated a database of over 2600 plant species and defined their traits.

Bioclimatic modelling was undertaken for all species, resulting in national-level maps of climatic suitability for each species.

**Bioclimatic models** = estimated areas of climatic suitability for each species under a changing climate in 2030, 2050 and 2070.
This module accessed success and failures of urban tree plantings in relation to local conditions as well as variables such as planting and management techniques.

12 ‘Living Labs’ were established across Australia.

The ‘Living Labs’ tested three different planting scenarios to test co-benefits.
This module subjected a sample of 113 species to controlled heatwave and drought conditions in glasshouses to assess the abilities of different species to withstand:

- Drought tolerance
- Heat tolerance
- Plant stress indicators
Traits such as wilting point, leaf critical temperature, leaf thickness and leaf area were measured to help predict which species will be heat and drought tolerant.

**Tolerators** – thicker, tough, small leaves, low surface area, hairy, architectural adaptations, stomatal control

**Avoiders** – deep root systems, will drop leaves, succulent, draw moister from leaves
Future proof urban landscape projects with climate-ready species

Underpinned by the latest scientific research

Which Plant Where is a culmination of 5 years of research investigating which horticultural species will survive in Australian urban landscapes, not only now but under future climates. This plant selection tool is underpinned by the latest scientific evidence, providing growers, nurseries, landscape architects and urban greening professionals with integrated tools and resources to develop resilient and sustainable urban green spaces for the future.

The Which Plant Where project acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islander cultures and to Elders past, present and emerging.
**Lophostemon confertus**

**Species**
- **Tree**

**Family**
- Myrtaceae

**Synonyms**
- Lophostemon arboreus, Triodia griffithii, Triodia micropolytha, Triodia subverticillata

**Common names**
- Brisbane Box, Brush Box, Queensland Box, Queensland Brush Box, Scrub Box

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**Climatic Suitability**

**Location**
- Cherrybrook (NSW 2126)

**Climate Suitability**
- **Suitable**

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**Form**
- **Height in cultivation** 10 - 25 m
- **Spread in cultivation** ≈ 5 - 20 m
- **Origin** Native
- **Flower period** Spring, Summer
- **Leaf loss** Evergreen
- **Canopy shape** Pyramidal, Rounded, Spreading

**Site**
- **Urban space type** Garden, Park, Street, Water Sensitive Urban Design
- **Soil texture** Clay, Loam, Sand
- **Soil pH** Acidic, Alkaline, Neutral
- **Fertilisation** Poorly Drained Soil, Well Drained Soil

**Performance**
- **Shade tolerance**
  - Full sun
  - Part shade
- **Tolerance**
  - High drought
  - Moderate frost
  - High coastal
- **Drought strategy** Avoid
- **Heat Tolerance**
- **Growth rate** Fast, medium

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**Maps are powered by WPV**

**Version 1.0 - Date: 31/5/2021**

**whichplantwhere.com.au**
Perth

1050 m²

Climatic Suitability

Location: 6000

Co-benefits

Planting Diversity: High
Biodiversity: High
Carbon Value: Moderate
Shade Value: High
Climate ready street tree trials
A best practice guide

February 2022

Research and resources
The data base includes just a subset of species many of which many LGAs are continuing to trial. WPW is not meant to definitively rule out species.

Which Plant Where provides species suitability at the postcode level. This does not account for climate niches or interventions.
Which Plant Where was developed by a team of scientists and researchers from Macquarie University and Western Sydney University. The program is managed by Macquarie University.

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