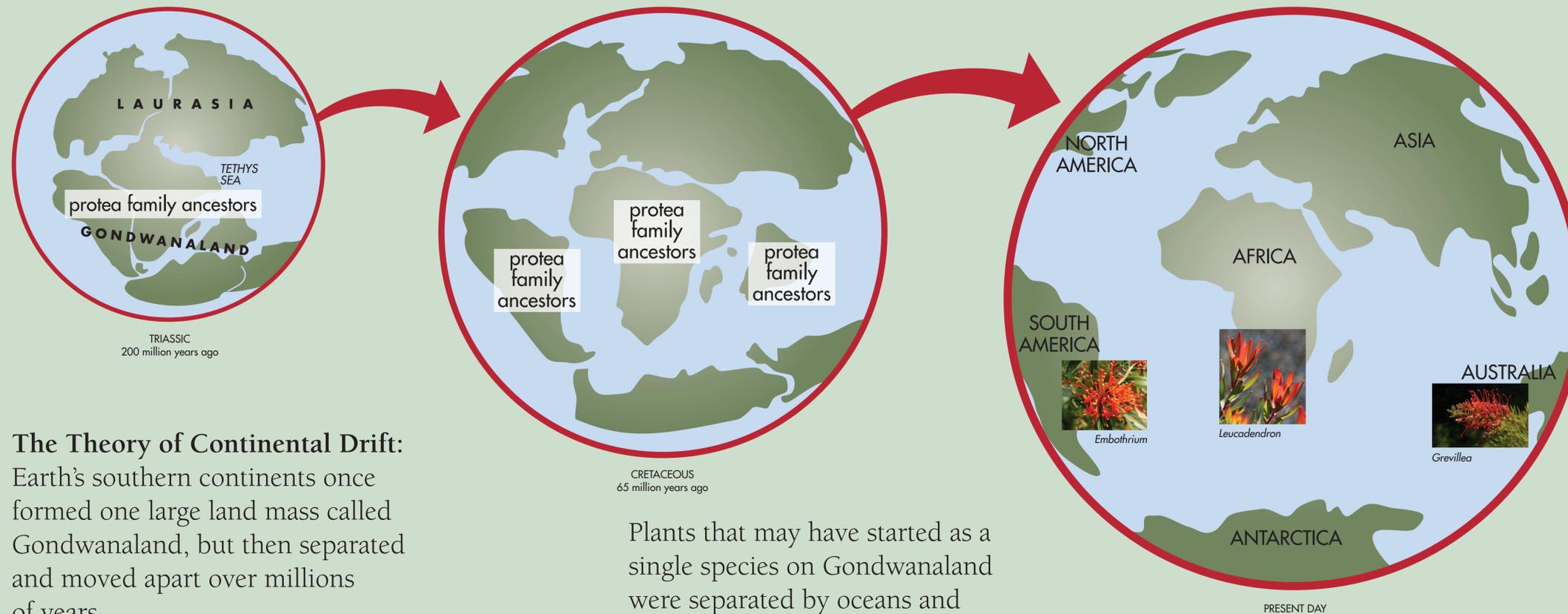


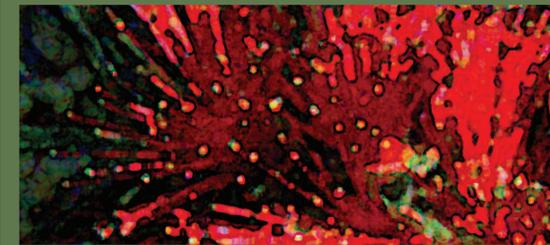
THESE PLANTS ARE close relatives BUT THEY'VE DRIFTED APART

Plants of the protea family (Proteaceae) all started out on the super-continent of GONDWANALAND, but they “lost touch” as the continents drifted apart about 150 million years ago.



The Theory of Continental Drift:
Earth's southern continents once formed one large land mass called Gondwanaland, but then separated and moved apart over millions of years.

Plants that may have started as a single species on Gondwanaland were separated by oceans and eventually evolved over time into different, but still related, species.



Can you still see our family resemblance?

Hint: Compare the leaves and flowers of these three related protea family members...



Embothrium—from South America



Leucadendron—from South Africa



Grevillea—from Australia

The relationships of these widely-separated plants provided evidence for the theory of Continental Drift.

Look for these plants and other Proteas in the garden around you.



Australian Collection

arboretum.ucdavis.edu

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SHOULD I GROW A eucalyptus?

You decide. Some species have given eucalyptus a bad reputation, but many others are good trees for the Central Valley.

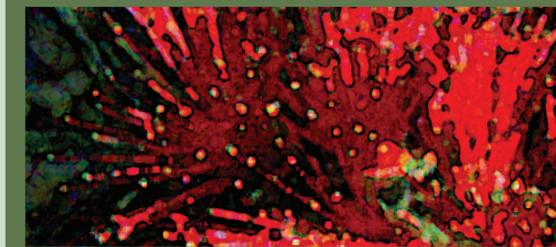
great tree?

- Many eucalyptus have showy flowers, beautiful bark, and attractive evergreen foliage
- Most are drought tolerant and thrive in the dry summers of California
- Several are fast-growing trees that provide quick shade or windbreaks
- With over 600 species ranging from shrubs to large trees, there are many types to choose from
- Eucalyptus trees create habitat for overwintering birds, such as hummingbirds, orioles, tanagers, and woodwarblers, that feed on nectar from their flowers
- Crushed leaves release aromatic oils with rich fragrance



or giant weed?

- Reaching 100 feet or more, some eucalyptus species are too big for most gardens
- Aromatic oils make them more flammable
- Some are so well adapted to California's climate that they have become invasive weeds
- They can be messy—dropping limbs, seed capsules, leaves, and bark
- They can suppress growth of neighboring plants
- Many are susceptible to frost and can die back in severe freezes



The Beauties

Recommended eucalyptus species for Central Valley landscapes

Red ironbark

Eucalyptus sideroxylon

- Medium-large tree (30-50 ft.)
- Attractive pink flowers
- Dark brown, rough bark doesn't shed
- Cold hardy in the Central Valley



Bidgee

Lemon-flowered mallee

Eucalyptus woodwardii

- Small tree for small gardens (15-30 ft.)
- Smooth, pale bark
- Large lemon-yellow flowers
- Attractive weeping form
- Cold hardy in the Central Valley



Ross McGuinness

The Beasts

Don't plant these monsters! These trees give eucalyptus a bad name. They share these negative qualities:

- Weedy in the Central Valley (they can spread to wild lands)
- Grow very large (100+ ft. tall)
- Die back in hard freezes



Flooded gum

Eucalyptus rudis



River red gum

Eucalyptus camaldulensis

Fr0002/Flagstaffphotos, www.tsi.org

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Look for the map of Australia on plant labels to find more Australian plants.



Alexander Turnbull Library, Wellington, N.Z.
There were ten species of moa, which were large, flightless birds found only in New Zealand.

No MORE moas?

Before European settlement, New Zealand had no browsing or grazing mammals. That role was filled by large, flightless birds called moas. Polynesians, who arrived about 1,000 years ago, had hunted the tasty moa to extinction by about 400 years ago.

Although moas are extinct, many New Zealand plants still show features that evolved over hundreds of thousands of years to discourage moa munching.

Corokia cotoneaster, © (2009) Paul Ashford, www.NZplantpics.com



Tangled, thicket-like shrubs have small leaves and lots of interlacing stems, so they are hard to eat and don't offer much nutrition.

Carex lasiocoma, © (2009) Paul Ashford, www.NZplantpics.com



Bronze-leaved plants have reddish or brownish foliage, so they look dead or dying to grazing birds—not very appetizing!

The New Zealand plants in this part of the Arboretum do well in Central Valley gardens. They...

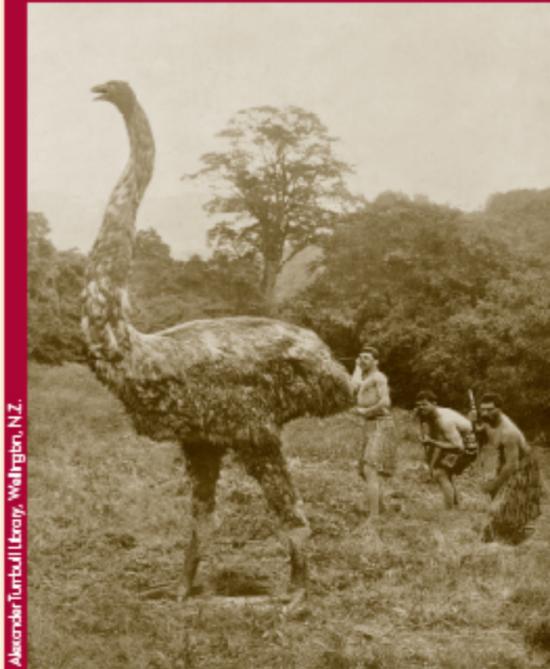
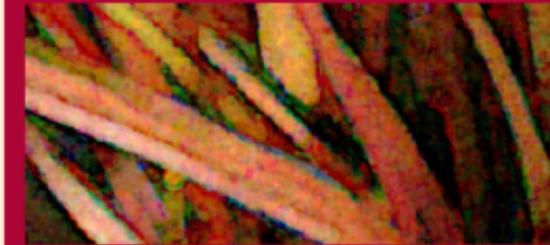
- Have a compact growth habit
- Are low maintenance
- Can be ideal hedge plants
- Thrive in part shade with summer irrigation
- Provide a range of textures and colors for dramatic effects
- Add a touch of New Zealand to your garden!

New Zealand Collection



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Moa hunt (recreated). The largest Moa species reached 12 feet in height and weighed more than 500 pounds.

**No moa
No moa
In old Ao-tea-roa
Can't get 'em
They've et 'em
They're gone and
there ain't no moa.**

—W. Chamberlain

Aotearoa is the Maori name for New Zealand. It means "land of the long white cloud."



WEAVE New Zealand flax INTO YOUR GARDEN TAPESTRY

New Zealand flax is one of the most useful plants to the native Maori people, who call it *harakeke*.

Maori people cultivate and harvest New Zealand flax.



They grow special varieties of flax selected long ago from natural stands for their desirable leaf and fiber properties.

Ali Brown, www.allibrown.co.nz

They use it to create beautiful and useful products.



The long, strap-shaped leaves are split into weaving strips, scraped with a shell or dull knife to soften, and boiled. Natural plant-based dyes can give a variety of colors.

Maureen Harle, www.wildsandsweaving.co.nz

Ali Brown, www.allibrown.co.nz

Weaving flax is an important cultural tradition.



New Zealand flax is the primary material used in traditional Maori clothing—rain capes, cloaks, skirts, loincloths, sandals, and belts—as well as in fishing nets, sails, bird snares, ropes, floor mats, and baskets.



Forest & Kim Starr

GROW IT in your garden

Many hybrids of New Zealand flax (*Phormium* spp.) are available to add beautiful color and striking architectural form to your garden.

Hybrids may be upright or arching, 1.5 ft. to 5 ft. tall, with leaf colors ranging from pale yellow through rose or bronze to deep maroon and chocolate brown, with many striped color combinations.

In the Central Valley, colorful flax varieties do best with

- afternoon shade
- regular water
- annual removal of dead and damaged leaves

A different kind of flax...

New Zealand flax (*Phormium* spp.) is not related to common flax (*Linum usitatissimum*), the Mediterranean native plant used to weave linen, but was named after it since both plants are used for fiber.

New Zealand Collection



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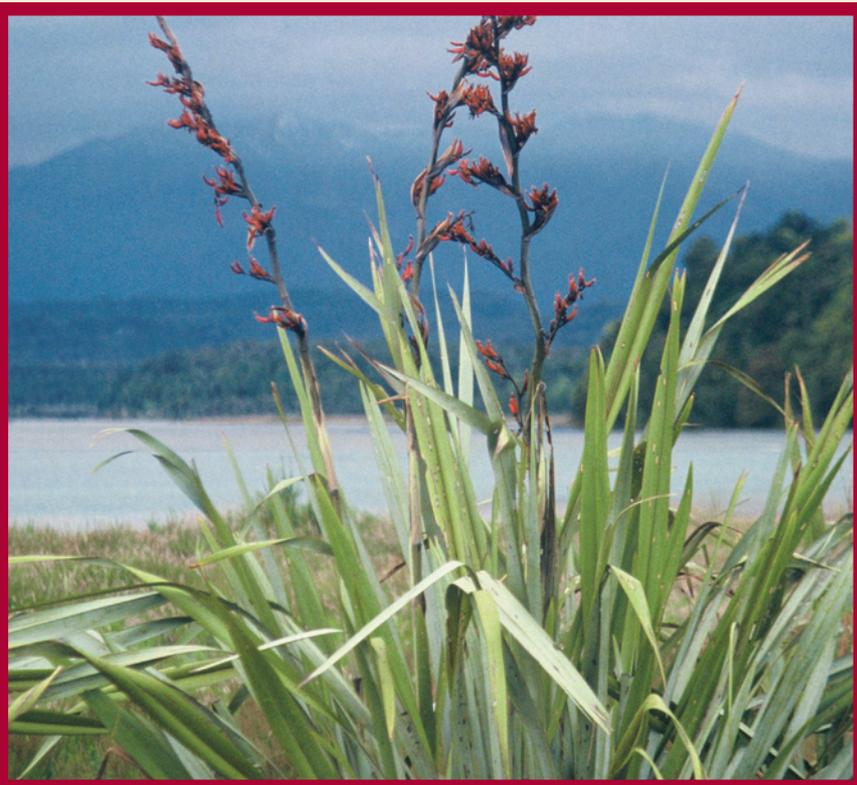
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Look for the map of New Zealand on plant labels to find more New Zealand plants.

WELCOME TO THE NEW ZEALAND AND AUSTRALIAN COLLECTIONS

Philippe Gerbeau



DR. GEORGE MASON

is a scientist from New Plymouth, New Zealand, who received his doctorate in plant physiology from UC Davis in 1960. He used his understanding of plant growth and selective plant management to develop a successful career in the weed control industry in his home country. More recently, Dr. Mason has been involved in a project to help Indian peasant farmers in a Himalayan border region improve water supplies for households, animals, and crop irrigation. He has also been selecting, propagating, and developing different cultivars of vegetables, fruits, and cut flowers and supplying them to local farmers in the region to increase crop diversity and improve yields.



George Mason above his garden of trees in Taranaki, a province on the west coast of New Zealand's North Island.

In 2006, Dr. Mason made a very generous gift to the UC Davis Arboretum to support adding New Zealand plants to the Arboretum, expanding our current Australian collection, and developing a larger focus on Southern Hemisphere and Gondwanaland plants.

To learn how you can support the Arboretum's collections and programs, please see the Arboretum's website.



arboretum.ucdavis.edu

WHY IS THIS Central Valley All-Star a weed in Australia?

Climate makes all the difference.

California's All-Star

In California's Central Valley, cold, frosty winters kill Formosan flame tree seeds before they mature. Instead of growing year round as it does in Australia, the tree goes dormant for the winter, so it doesn't spread like a weed.



Ellen Zagory

Formosan flame tree (*Koelreuteria elegans* subsp. *formosana*), native to Taiwan and Fiji, was introduced to both California and Australia.

Australia's Weed

In subtropical eastern Australia, warm, frost-free winters allow the non-native Formosan flame tree to re-seed prolifically. Instead of going dormant in the winter as it does in California, the tree remains evergreen, grows vigorously all year, and spreads like a weed.

Too much of a good thing?

Some characteristics can make the same species a great garden plant in one climate and an invasive weed in another.

Consider the case of the Formosan flame tree:

- It grows rapidly
- It thrives in a wide range of soil, water, and climate conditions
- It produces a profusion of flowers and beautiful red seed pods

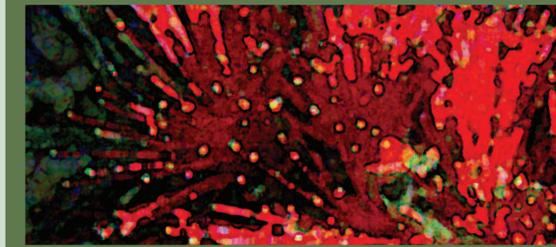
The Central Valley's colder winter holds this tree in check, but it goes wild in Australia's milder climate.

Australian Collection



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Weeds Gone Wild

An invasive weed is any non-native plant that spreads on its own in wild areas. Invasive plants pose a major threat to the survival of native plants and animals in California. Gardeners around the world must be very careful when they introduce new plants to their environment to ensure they are not invasive. Invasive plants that are causing problems in northern California include *Carpobrotus* iceplant, pampas grass, Scotch broom, tamarisk, and tree of heaven.



Tamarisk on Bear Creek, Colusa County

An invasive non-native plant, tamarisk was introduced as a garden plant and for erosion control in California. It is now spreading through the Central Valley and the central and south coast, crowding out native plants, clogging waterways, lowering the water table, and increasing soil salinity.

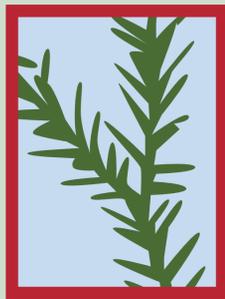


Look for the map of Australia on plant labels to find more Australian plants.

A WELL-ADAPTED • AUSSIE

This gnarly old **melaleuca** (mel-uh-LOO-kuh) shrub from Australia has survived here for over 40 years without irrigation.

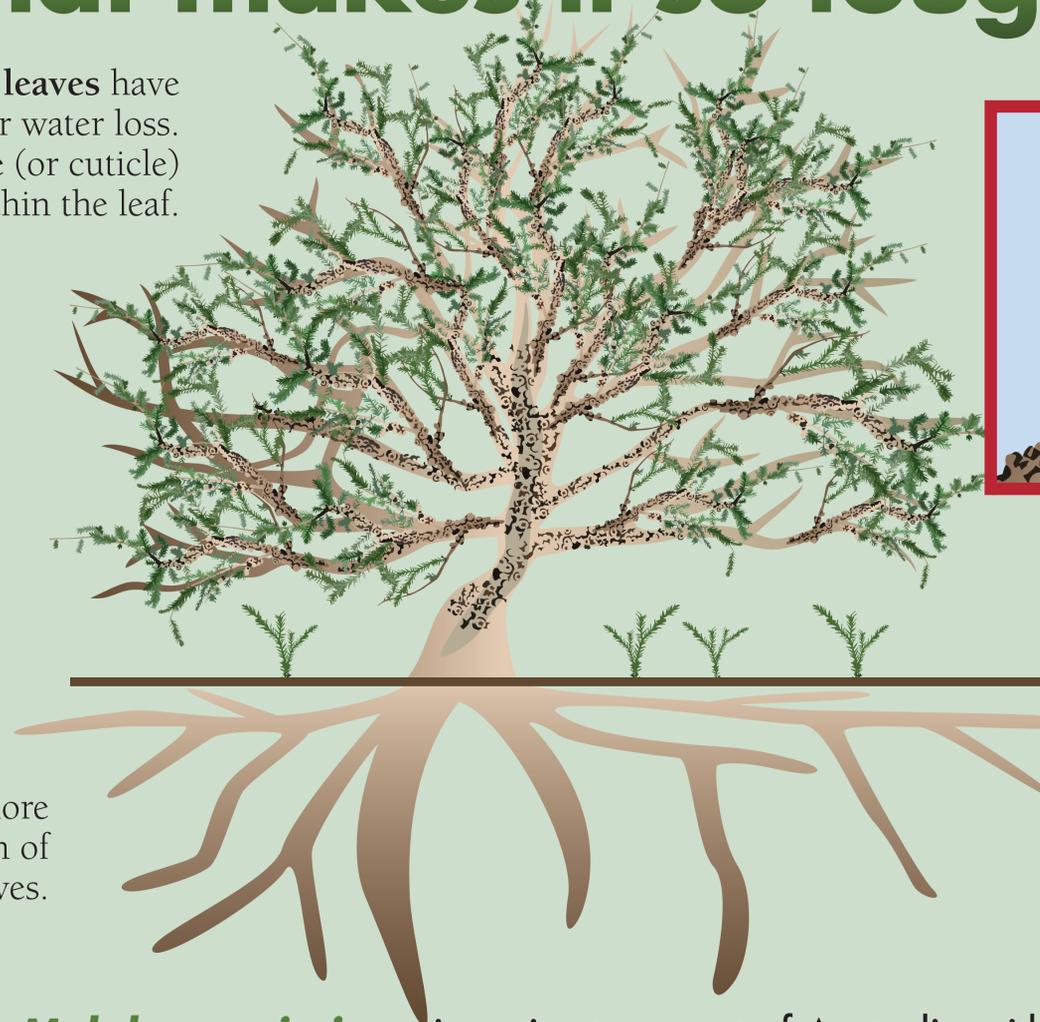
What makes it so tough?



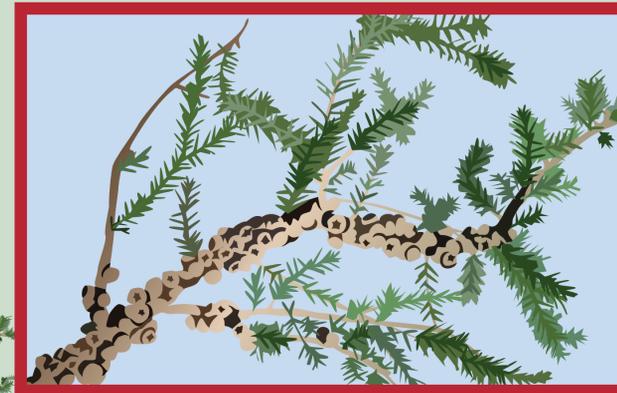
Small, needle-like leaves have less surface area for water loss. A **waxy leaf surface** (or cuticle) keeps water sealed within the leaf.

Evergreen leaves, which stay green all year, can gather energy from the sun in winter when water is plentiful, as well as during the dry summer months.

Deep and far-reaching roots explore a large volume of soil in search of hidden water reserves.

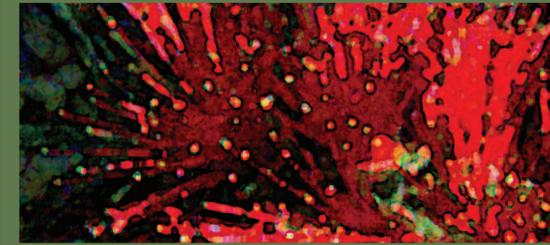


Melaleuca viminea is native to a part of Australia with a climate similar to that of California's Central Valley.



What are those strange knobs on the stems?

Knobby, woody fruits cling for years to melaleuca stems and only **release seeds after a fire** onto a fertile, ashy seedbed. Like some of California's chaparral plants, fire-adapted melaleucas reproduce prolifically by seed after a burn.



A world away... but feels the same

The melaleuca evolved in southwestern Australia, which has a similar climate to Central California, with hot, dry summers and cool, wet winters. This type of Mediterranean climate is only found in five regions of the world.



Many plants from southern and western Australia and the other Mediterranean climate regions make well-adapted additions to Central Valley gardens.

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