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Chilean mayten – an increasingly invasive tree in Canterbury

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Introduction

Maytenus boaria (also known as Chilean mayten, mayten or maiten) is a woody South American species becoming increasingly more invasive, especially in the Canterbury region. This tree has real potential to become yet another major environmental weed in New Zealand.

A timeline of known information for Chilean mayten establishment and subsequent concerns raised in New Zealand is:

- 1881: Introduced into cultivation at the Christchurch Botanic Gardens from imported plant material.
- 1929: Male clones sold commercially by Duncan & Davies Nurseries, New Plymouth.
- Mid-1980s: Seed-grown plants started to be sold, including females.
- 1986/1989: Recorded as naturalised from herbarium specimens.
- 2002: Joe Cartman and Kate McCombs (CCC) published their concerns on the emerging invasiveness.
- 2010: Alan McDonald (DOC) published notes on three emerging invasive species for Canterbury, including Chilean mayten.
- 2012: Chilean mayten added to the National Pest Plant Accord (NPPA) list.
- 2016 and 2017: Murray Dawson (MWLR) published articles outlining the emerging threat.
- 2018: Chilean mayten listed in the Canterbury Regional Pest Management Plan (RPMP) 2018–2038 as an “Organism of Interest”.
- Present day: iNaturalist NZ – Mātaki Taiao citizen science observations indicate an expanding distribution for Chilean mayten, particularly in Canterbury.
- Present day: ECan are preparing publicity material to raise awareness of the invasiveness of Chilean mayten.

What is Chilean mayten?

Chilean mayten belongs to the Celastraceae family and is native to South America, naturally occurring in Chile and Argentina from about 30°S to 50°S.

This evergreen tree is fairly cold-hardy and drought resistant. It is cultivated as a small to medium sized tree, typically reaching 6–8 m after several decades (Fig. 1, p. 68). However, under optimum conditions and given enough time it can eventually grow up to 20–30 m tall (Fig. 2, p. 68). When mature, this graceful tree develops a straight trunk and pendulous branchlets that sway in the wind. It has fissured grey bark (Fig. 3, p. 69).

Chilean mayten leaves are alternately arranged, glabrous (hairless), glossy and dark green on the upper surfaces, lighter green on the lower surfaces, and shortly petiolate (with leaf-stalks 1.3–6 mm long). The leaves are (15–)20–60(–75) mm long, narrowly lanceolate to elliptic, and with finely serrated margins (Fig. 4, p. 69).



Figure 1. Chilean mayten planted in front of Governors Bay Fire Station, Banks Peninsula, Canterbury. This small tree produces fruit, and self-sown saplings are found nearby. (<https://inaturalist.nz/observations/5927646>).



Figure 2. Large mature tree of Chilean mayten cultivated at Lincoln University, Canterbury. This tree pre-dates the sale of female (seed-setting) material on the market. (<https://inaturalist.nz/observations/26535147>).



Figure 3. Close-up of the fissured grey bark of Chilean mayten. From a mature tree planted on a street frontage near Bottle Lake Forest Park, Christchurch. (<https://inaturalist.nz/observations/5973295>).



Figure 4. Finely serrated leaves of Chilean mayten. From a shrub naturalised in Saint Mary's Anglican Church grounds, Halswell, Christchurch. (<https://inaturalist.nz/observations/25860052>).

In New Zealand Chilean mayten flowers from late August to October. Its flowers are solitary or arranged in axillary clusters (arising from the stems), about 5 mm in diameter, 5-merous, greenish-yellow and relatively inconspicuous. Separate male (Fig. 5) and female (Fig. 6) flowers are produced.



Figure 5. Close-up of male flowers of Chilean mayten. From a shrub naturalised in the Manaaki Whenua – Landcare Research grounds, Lincoln, Canterbury. (<https://inaturalist.nz/observations/4218287>).



Figure 6. Close-up of female flowers of Chilean mayten. From a shrub naturalised in the Manaaki Whenua – Landcare Research grounds, Lincoln, Canterbury. (<https://inaturalist.nz/observations/4222010>).

In New Zealand it is usually described as a dioecious species (having separate male and female plants). However, the sexuality and reproductive biology of Chilean mayten may be more complex. Some overseas accounts suggest that Chilean mayten is monoecious (with male and female flowers together on the same plant) or polygamous (bearing some flowers with stamens only, some with pistils only, and occasionally some with both, on the same or different plants). Closer examination of New Zealand material may be warranted.

Seeds formed on female plants mature from March to June and are surrounded by orange to dark red coloured fleshy arils (Fig. 7, p. 71). The persistent fruit capsules are yellowish-brown in colour (Fig. 8, p.71).



Figure 7. Close-up of fleshy fruit arils of Chilean mayten. From a small tree planted in front of Governors Bay Fire Station, Banks Peninsula, Canterbury. (<https://inaturalist.nz/observations/5927646>).



Figure 8. Close-up of old fruit capsules persisting on a Chilean mayten tree. This female tree was planted in the Canterbury Agriculture and Science Centre (CASC) grounds, Lincoln, some 30-years ago. It was a likely seed source causing its spread on the campus. This tree has now been cut down and the stump poisoned. (<https://inaturalist.nz/observations/a4459816>).

Why is it weedy?

Chilean mayten has a wide range of weedy attributes including:

- Long-life.
- Drought resistance.
- Persistent suckering from roots (Fig. 9).
- Resistance to poisoning.
- Shade tolerance, but also an ability to grow in full sun.
- Easily overlooked; as a shrub intergrowing with, and difficult to distinguish from, New Zealand native plantings.
- Flowering and fruiting from an early age (3–5 years, 2 m tall).
- Seeds readily dispersible by birds.



Figure 9. Persistent suckering from a Chilean mayten tree that was cut down more than 15 years ago in the CASC grounds, Lincoln. (<https://inaturalist.nz/observations/5003463>).

Chilean mayten was considered relatively benign and was cultivated (clonally through root cuttings) with few issues for more than 130 years in New Zealand. Unfortunately, this all changed from the mid-1980s when seed-grown plants started to appear on the market, and inevitably some of these were female. Birds love to eat the fleshy seed-containing arils and thus Chilean mayten has now gained wings in New Zealand. This has allowed the species to disperse well beyond the original (male) plantings and to colonise new areas.

Chilean mayten can establish in a wide range of habitats including open pasture, shelterbelts, parklands and native plantings. Canterbury is a stronghold for the invasive spread of Chilean mayten, especially in Lincoln, Red Zone land (eastern suburbs of Christchurch City and Kaiapoi), and around the base of the Port Hills.

I've pointed out earlier records of it naturalising near Eastwoodhill Arboretum (Gisborne) and in Bason Botanic Gardens (near Whanganui). More recently, Richard Pender (Wildland Consultants) confirmed it naturalising in Rotorua. No doubt other locations will be uncovered as this species gains a wider foothold.

What is it confused with?

When it's still a shrub, Chilean mayten is easily overlooked and under-reported. Unless in fruit, it is rather nondescript with its small evergreen leaves and few distinguishing features. As a shrub it resembles several native New Zealand plants, such as māhoe (*Melicytus ramiflorus*) and lacebarks (*Hoheria angustifolia* and *H. sexstylosa*).

As a mature tree, Chilean mayten can be confused with several exotics, including weeping willow (*Salix babylonica*) and pepper tree (*Schinus mole*).

What can we do about it?

Thankfully, some regulatory controls have been applied in recent years. Its addition to the National Pest Plant Accord (NPPA) list bans it from sale, distribution and propagation throughout New Zealand. Because Chilean mayten is long lived, numerous trees are still growing in cultivation.

Inclusion in the latest Canterbury RPMP is also a step in the right direction. However, it is listed only as an "Organism of Interest" (RPMP, Appendix 2, p. 90), which means there are no formal control programmes applied to Chilean mayten under that plan.

ECan are currently preparing publicity material to raise awareness of its invasiveness. They are asking for sightings from the public to be added to the iNaturalist NZ platform, to more fully establish presence and scope of spread in Canterbury (Fig. 10)

A project for sightings has been created at <https://inaturalist.nz/projects/canterbury-chilean-mayten-mayhem>.

To effectively nip the establishment curve of this invasive species in the bud, early intervention is needed. Search-and-destroy of female plants and self-established saplings in particular should be undertaken as soon as possible to mitigate further spread. It is possible to put the Genie back in the bottle, but only if we act now.



Figure 10. Distribution of Chilean mayten in Canterbury. Map generated in August 2019 from iNaturalist NZ (<https://inaturalist.nz/taxa/77969-Maytenus-boaria>).

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