

Yellow fever tree

Vachellia xanthophloea



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First published 2012

Updated 2021



Queensland
Government

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Summary

Vachellia xanthophloea is a semi-deciduous, quick-growing tree that grows 10–25 m tall. It is native to southern and eastern Africa.

Preferred habitat includes riparian areas and other low-lying areas that are periodically flooded, or have shallow water tables, within tropical and subtropical savannahs.

Like many of its congeners, *Vachellia xanthophloea* can dominate areas cleared for grazing within its native range. It also shares several biological attributes with one of Queensland's worst invasive plants of grazing land, *A. nilotica*. As such, it seems reasonable to predict that *Vachellia xanthophloea* could become a significant invasive plant of grazing land and riparian habitats in semi-arid and arid parts of Queensland.

To date, only two or three specimens of *Vachellia xanthophloea* have ever been detected in Queensland (as garden specimens) and the species does not appear to have naturalised anywhere. Hence, there seems to be an opportunity to prevent this species from becoming a major pest.

Introduction

Identity and taxonomy

Species: *Vancellia xanthophloea* Benth

Synonyms: Not known

Common names: Yellow fever tree, fever tree, koorsboom

Family: Fabaceae

Nomenclature

Acacia is a pantropical genus comprising more than 1200 species, around 900 of which are from Australia, about 200 from America and about 130 from Africa. There is uncertainty as to whether *Acacia* should be treated as a single genus. The XVII International Botanical Congress accepted that the name *Acacia* should be reserved predominantly for Australian species, with remaining species split between *Acaciella*, *Mariosousa*, *Senegalia* and *Vachellia* (Maslin 2006).

Description

Vachellia xanthophloea is a semi-deciduous, quick-growing tree 10–25 m tall. Its bark is smooth, slightly flaking and coated with a distinctive greenish-yellow powder that can be rubbed away to reveal a green colour. Leaves are bipinnate, with 4–7 pairs of pinnae and 10–17 pairs of leaflets per pinnae. Leaflets are 2.5–6.5 mm × 0.75–1.75 mm. Petiolar glands are usually present at the base of the upper pinnae pairs. Spines are white, straight and strong and arranged in pairs. The name ‘yellow fever tree’ is believed to reflect its yellow bark and tendency to grow in swampy areas in Africa, where malaria is common.



Vachellia xanthophloea in a garden in South East Queensland (Photo: John Rose, Gold Coast City Council)



Spines are large, white, straight, strong and arranged in pairs

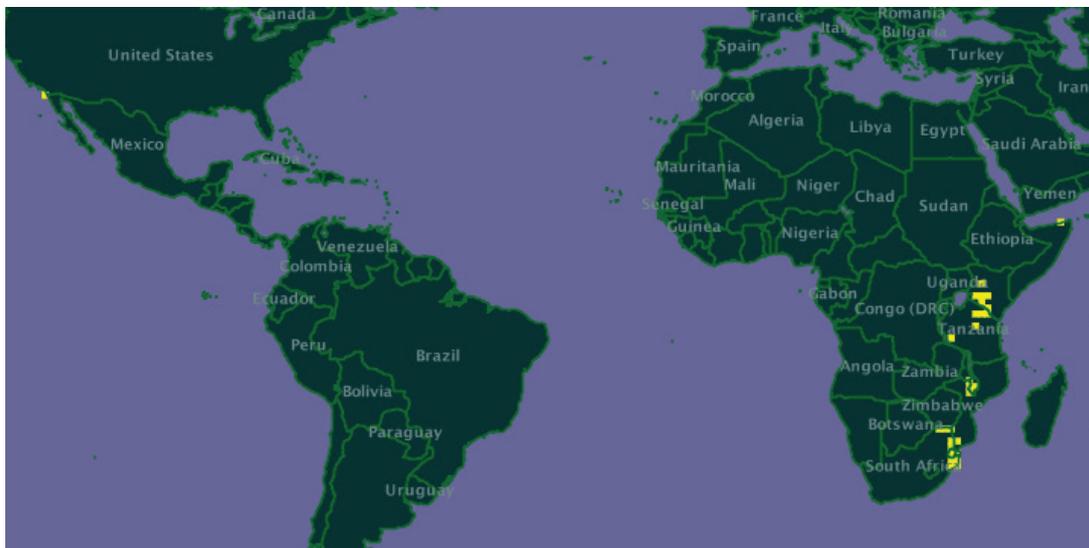
Flowers are yellow, spherical, fragrant and clustered on slender stalks in the axils of spines. Fruit are flat, papery, light brown pods, 5–19 cm long, containing 5–10 seeds per pod. Seeds are elliptical, flattened, dark brown and released when the pod bursts open (Brenan 1959; World Agroforestry Centre n.d.; University of Arizona 2010).



Bark is smooth and coated with a greenish-yellow powder that can rub off easily

Reproduction and dispersal

Reproduction is generally from seeds. Flowers are pollinated by insects. Pods take 4–6 months to mature. Within its native range, pods are heavily damaged by herbivores (World Agroforestry Centre n.d.; Louppe et al. 2008). Like most acacias, seeds require scarification to achieve maximum germination (Louppe et al. 2008).



Native range of *Vachellia xanthophloea* (Global Biodiversity Information Facility n.d.)

Origin and distribution

Vachellia xanthophloea is native to southern and eastern Africa, including Botswana, Kenya, Malawi, Mozambique, Somalia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe (World Agroforestry Centre n.d.; Germplasm Resources Information Network n.d.).

It has been introduced as a landscape tree into Taiwan (World Agroforestry Centre n.d.), India (Kang & Reynolds 1982), California and probably many other countries.

Preferred habitat

The native range of *Vachellia xanthophloea* extends across tropical and subtropical climates, from the equator (Somalia and Kenya) to South Africa. Preferred habitat includes low-lying (generally swampy) areas, such as periodically flooded depressions and riparian areas (creek banks and lake margins) within tropical and subtropical savannah. Suitable habitat extends into semi-arid and arid areas (generally restricted to areas where the plant's roots can access shallow water tables).

In some periodically flooded areas within the African savannah, it forms dense, dominant stands (University of Arizona 2010; World Agroforestry Centre n.d.). Such stands are often comprised of even-aged specimens that regenerated en masse after a flood event, with up to 85 stems per hectare recorded in South Africa (Louppe et al. 2008). In areas of savannah woodland that are cleared for grazing, *Vachellia xanthophloea* can be a dominant fast-growing pioneer.



Vachellia xanthophloea growing in a low-lying depression within an African savannah (Photo: Haplochromis. Reproduced from Wikimedia Commons with permission to copy, and distribute under the terms of a GNU Free Documentation License published by the Free Software Foundation, <http://commons.wikimedia.org>)

While preferring sandy, alluvial soils, it can tolerate a range of alluvial soil types, including poorly drained black soils (Lind & Morison 1974; World Agroforestry Centre n.d.; Zipcodezoo.com n.d.). It prefers full sun.

History as a invasive plant elsewhere

This study was unable to find evidence that *Vachellia xanthophloea* was a major invasive plant outside its native range. However, it appears to be a locally abundant species affecting pastures within its native range.

Uses

Vachellia xanthophloea is cultivated as a garden ornamental, presumably for its yellow, fragrant flowers. In some of the dry parts of southern Africa, it is also grown as a source of wood (Noad & Birnie 1989).

Pest potential in Queensland

Current distribution and impact in Australia

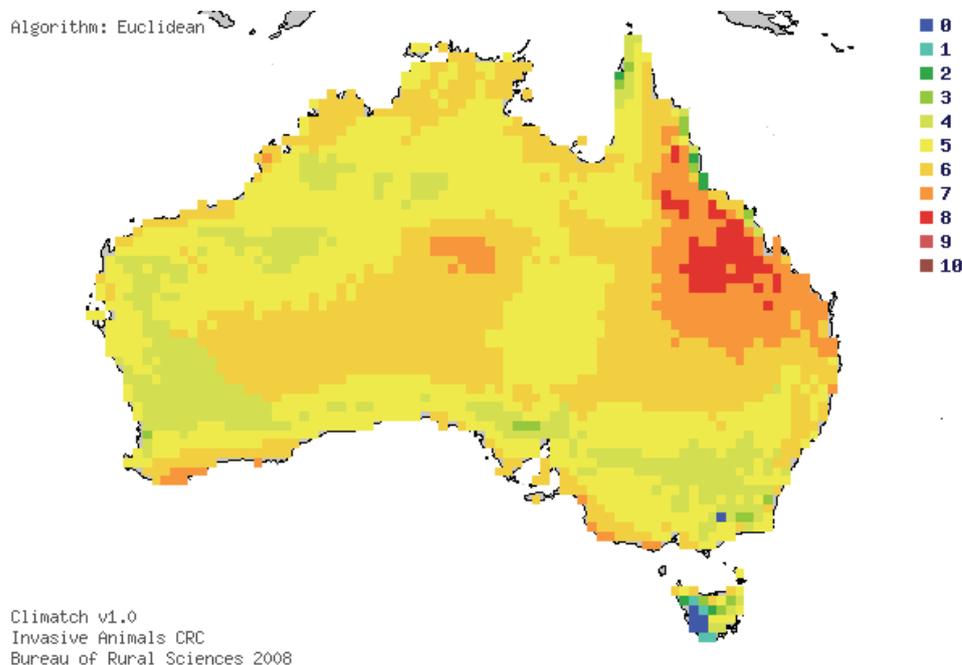
Vachellia xanthophloea appears to be rare in Australia and restricted to gardens. It was recorded growing in a zoo in Perth, with all specimens since destroyed (Hussey & Lloyd, 2002). Similarly, isolated garden specimens were detected and destroyed around Brisbane and the Gold Coast in 1992 and 2010 (Csurhes & Edwards 1998; DEEDI file records).

Sale and cultivation of *Vachellia xanthophloea* is prohibited in Queensland, where the species is a target for eradication.

Potential distribution and impact in Queensland

Climate modelling using the Climatch software (Bureau of Rural Sciences 2009) was applied to predict areas of Queensland where climate is similar to that experienced across the native and naturalised range of *Vachellia xanthophloea*. The results suggest that *Vachellia xanthophloea* is well suited to tropical and subtropical savannahs of Queensland, from subcoastal areas west to the arid zone.

Within this area, it has the potential to invade riparian habitats as well as other low-lying poorly drained sites, across a range of soil types. Experience from within its native range in Africa suggests it can be a pioneer species of grazing land, with a propensity to form dense stands. Like most *Acacia* species, it is expected to produce a long-lived soil seed bank, making control costly.



Area of Australia where climate appears suitable for survival of *Vachellia xanthophloea*. Red and dark orange are highly suitable, light orange and yellow are marginally suitable, and green, blue and white are unsuitable. Map produced using Climatch computer software (Bureau of Rural Sciences, 2009)

While this species does not appear to be a major invasive plant elsewhere, it is closely related to a range of very problematic *Acacia* species, including *A. nilotica* which ranks as one of Queensland's worst invasive plants of grazing land, costing landholders an estimated \$3 million to \$5 million per year in control costs and infesting more than 6 million ha of grazing land (Mackey 1996).

Control

Vachellia xanthophloea is an ideal target for exclusion, early detection and eradication in Queensland, since it appears restricted to gardens. Failure to prevent its naturalisation and spread could cause significant problems in semi-arid grazing land.

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