

# **Activity # 1- Assessing Horticultural Crop Suitability for the Queensland Murray Darling Basin Study Area**

## **Specific Biophysical Crop Information – Quandong**

(1 August 2014 to 30 June 2016)

## Activity 1 — Project Team

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## Quandong

Based on the biophysical requirements and **limiting factors**, **Quandong is not currently considered a potential crop** for the Balonne-Border Rivers Region of the QMDB. Though climatically suited to the drier inland areas of the region propagation and cultivation is considered difficult. Seed has a dormancy that is strongest in fresh seeds, though one year's ageing raises seed germination from about 5 to 30%. The quandong plant is hemi-parasitic and needs a suitable host to maximise growth and yield potential. This crop/host relationship is critical to yield, crop vigour and plant survival. Further research and evaluation is required to maximize commercial potential.

## Crop Overview

The quandong tree (*Santalum acuminatum*) is a close relative of the sandalwood and has a wide native distribution in semi-arid Australia. The quandong industry is a significant component of the native food industry. The tart-tasting fruit can be eaten fresh or, more commonly, halved and dried and then reconstituted and used in a range of sweet and savoury products, such as preserves, sauces and chutneys, as pie filling or in cordials and liqueur. The kernel is also edible.

The commercial cultivation of quandong is still in its infancy and while advances have been made in propagation and cultivation, much is still unknown. One of the most pressing issues is that of host selection. The quandong is a parasitic plant that attaches to the roots of its hosts from which it draws water and nutrients. The range of possible hosts is apparently quite extensive, however, there is evidence that some hosts are better than others (Lethbridge, 2003).

## Biophysical Requirements and Limiting Factors (climate)

The quandong (native peach) being a partially root parasitic plant, is able to obtain water and nutrients from the roots of nearby plants. These parasites produce a modified root structure called a haustorium, which attaches to a host root and extracts xylem sap. In a natural situation quandong plants seem to rely on nitrogen fixing trees such as Acacia and Casuarina, though it's known to parasitise many other legumes, shrubs, herbs and grasses. The quandong normally has more than one host at a time.

### Temperature

Quandong plants grow best in areas of **high light** intensity and **low humidity**. The fruit is a visually appealing red, tart tasting and dry textured. Fruit is either dried or frozen and used as a processing and culinary fruit. It is quite drought and salt tolerant and is likely to have frost tolerance when mature.

### Rainfall

The quandong tree has a wide native distribution in **semi-arid** Australia.

### Soils

Plants will grow in a range of well-drained soil types, tolerate soil pH variations and will grow in high salinity soils. Quandongs will not tolerate waterlogging.

### Irrigation

The quandong is highly tolerant of saline water and drought (Lethbridge 2008)

## Host Plant Selection

Watling and Lethbridge in their 2007 report note that *Acacia victoriae*, under the present management regime, is only a good host in the first couple of years of parasite establishment, and that growers would be advised to interplant with other more resilient hosts to sustain parasite growth and fruit production in the long term. The best hosts for this purpose, based on their report would be *A. calamifolia*, *A. hemiteles* and *A. argyophylla*, but not necessarily in that order. Although *A. hakeoides* was least affected by quandong parasitisation it was also the least suitable host in terms of both parasite growth and fruit production. **Host choice** will depend on other factors such as water availability, **soil** types, salinity and **climate**.

### Commercially used native foods – source and supply status

Source: The New Crop Industries Handbook Native foods 2010

Species	Mainly cultivated	Cultivated/ wild harvest	Mainly wild harvest	Supply
Aniseed myrtle *	Yes	No	No	Under
Bush tomato	No	Yes	Yes	Under
Davidson's plum	Yes	Yes	No	Over
Kakadu plum	No	Yes	Yes	Over
Lemon aspen	No	Yes	Yes	Over
Lemon myrtle	Yes	No	No	Over
Native citrus	No	Yes	No	Over
Native pepper	No	Yes	Yes	under
Pepper-berries*	No	Yes	Yes	under
Native mint *	Yes	No	No	Under
Riberries	Yes	No	No	Under
Quandong	No	Yes	Yes	Over
Wattle seed	No	Yes	Yes	Over

## Plant Images



Quandong Fruit

Mature Tree

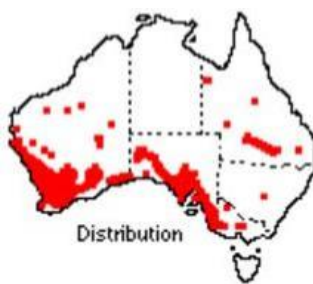
Fruit Kernel (source S McClean)

## Crop Lifecycle

Tiny flowers form racemes in late summer and are insect attracting. Fruits ripen in the following spring, forming a 15-25 mm wide drupe with striking, shiny red skin. Its flesh is about 3-5 mm thick. The fruit is a visually appealing red, tart tasting and dry textured. It is either dried or frozen and is a processing and culinary fruit. Direct seeding quandongs adjacent to dripper fed acacia plants would appear to be a robust system for the introduction of quandongs in the field requiring little seedling protection. However, significant care must be taken of the acacia plant to maintain the host parasite complex in a healthy state. There is still some way to go for efficient fruit and seed production and selection of appropriate forms of wattle and quandong will be a necessary step towards this goal

## Comparison Region(s)

Quandong plants are found in a wide variety of habitats characterised by generally nutrient poor, free draining soils



*Natural distribution* (Source: Aust National Botanic gardens)

Limited supplies of quandong fruit are available from wild-harvest and orchard production. The largest single planting in Australia (at Tumbly Bay in South Australia) is reported to be around 7,000 trees. (Heal 2001)

## Crop in the QMDB Region.

The RIRDC report “New Rural Industries – Making the Most of Future Climates” mentions quandong as a potential future crop option for the Murray darling Basin area.

This report can be downloaded from: [RIRDC Info Services](#)

Though some native foods such as the quandong occur naturally in the study area, basic plant management, varietal issues and fruit production and marketing issues need addressing if the industry is to develop.

**Note to reader:** while researching the quandong and several other native foods it seems there has **been a decline** in the literature available over recent years. An example of this was seen while trying to access The Australian Quandong Industry Association Inc. website the site seems to no longer function

Web link: [Central online](#)

## References

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Disclaimer: The candidate crop information presented in this QMDB study area report (Activity 1) are based on the analysis of the published biophysical needs of the crops (e.g. temperature, frost sensitivity, chill requirement, water quality, etc.) and current climate records for the QMDB study area. The candidate crops are deemed suited to the study area where the biophysical needs are met either year round or for portion of the year and will allow crop production.

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