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Breeding and Selection of *Brachychiton*©

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INTRODUCTION

Why *Brachychiton*?

- Beautiful trees naturally
- Ornamental trunks and foliage
- Free flowering
- Colours, white, red, pink, orange, and greenish
- Flowers up to 50 mm long and 40 mm wide in some species
- Many are deciduous flowering plants
- Flowering period can be many months
- Drought tolerant
- Not likely to become weeds

These make ideal characteristics for breeding.

BREEDING

Some Drawbacks. Some species may have flowers that upon falling could be a slip hazard to pedestrians and motorcycles. *Brachychiton discolor* F. Muell is such a species that produces mucilaginous excretions from fallen flowers. This results in an extremely slippery surface when it falls onto hard paved areas.

Substantial juvenility periods may hinder breeding and assessment programs.

Background. This genus contains many familiar species that are important ornamental and agricultural trees. *Brachychiton populneus* (Schott and Endl.) R.Br. kurrajong is considered an important fodder species during droughts, providing valuable feed for livestock, and has been planted for this purpose.

The other, more popular species are ornamental trees such as the Illawarra flame tree *B. acerifolius* (Cunn. Ex Endl.) Macarthur, Queensland lace-bark *B. discolor* F. Muell., and the Queensland bottle tree *B. rupestris* (Mitchell ex Lindley) Schumann. The latter has a spectacular bottle-shaped trunk that can grow to several metres in diameter (Guymer, 1988).

Assessment of Hybrids. The hybrids will be assessed on their:

- Precociousness, flower colour, size, and inflorescence size; flowering period, annual flowering, and duration of flowering season.
- Foliage colour and shape and the colour of the new growth.
- Tolerance to drought, frosts, and wet conditions.
- Mature size when compared to the three parameters for selection, specimen trees, trees under powerlines, and tub specimens.

BREEDING.

- Flowers are functionally unisexual by abortion, Schott and Endlicher (1832).
- Flowers generally are open for 2 days, falling on the 3rd.
- Flowers usually occur on the lower branches first closer to the trunk. Male flowers are much more numerous than female flowers, which often open later in the flowering period.
- Native bees are extremely fond of the pollen. Flowering in the tropics starts in September and continues through to November for *B. bidwillii* Hook.
  - This species (*B. bidwillii* Hook) is extremely useful as a parent because it is precocious and free flowering, producing large quantities of pollen and also a proportional number of female flowers.
  - The species is ideal because it has a low growth habit, freely branches, and is tolerant of a range of climatic extremes from tropical summers to frosty inland areas where it naturally occurs.
- Many of the earlier trial pollinations were unsuccessful because flowers are receptive to pollen on both days but abscission has already commenced on the second day, so fertilization is not successful and flowers are aborted.
- Pollination is also sensitive to the time of day with pollination activities after 8:30 AM on the first day not being successful. This is also exacerbated by hot dry winds or overly hot mornings.
- Fertilisation results in a rather swift swelling of the ovaries that is clearly visible after several days.
- Flower abortion can occur after a week or so and may be a result of nutrient or moisture stress on the parent.
- Boring larvae can also cause abortion of nearly mature pods even if only 2–3 of the 20 or so seeds have been damaged.

Parent Selection. Scion and rootstock interactions can also stunt growth and promote flowering such as between *B. acerifolius* (Cunn. Ex Endl.) Macarthur rootstocks and *B. garrawayae* (Bailey) Guymer scions. Scion growth is stunted causing it to produce relatively large numbers of flowers for the plant size. *Brachychiton garrawayae* (Bailey) Guymer is noted as growing to 12 m, but I have not grown a grafted specimen over 0.75 m. They have on two occasions produced so many flowers and subsequent fruit when deciduous that the plants have died. I do not believe that it is incompatibility but rather a hypersensitivity to some latent pathogen in the rootstock (Boorman, 2003).

The five species that I have used to date for breeding are *B. Bidwillii* Hook, *B. garrawayae* (Bailey) Guymer, *B. grandiflorus* Guymer, *B. velutinosus* Kostermans, *B.* sp. Exmore Station, and the natural hybrid *B.* ×*carneus* Guymer, (*B. garrawayae* × *B. grandiflorus*).

Other species that I have and am waiting for first flowering are *B. albidus* Guymer, *B. chillagoensis* Guymer, *B. discolor* F. Muell., *B.* ×*vinicolor* Guymer (*B. acerifolius* × *B. populneus* subsp. *populneus*), *B. acerifolius* × *B. discolor*, and three unnamed hybrids or species.

I will also include *B. acerifolius* (Cunn. Ex G. Don) Macarthur and *B. rupestris* (Mitchell ex Lindley) Schumann. Both species appear to have extremely long juvenile phases that make breeding programs time-consuming, so precocious species are the first I have used while establishing the other stock plants.

Brachychiton ×*carneus* Guymer (*B. garrawayae* × *B. grandiflorus*) has produced some interesting responses to insect attack, possibly a fruit-piercing moth. This response was a particularly strong terminal panicle that flowered over 3 months from both tips affected.

This may indicate the possibility of using growth regulators to promote flowering for breeding and display purposes.

The breeding has resulted in the production of 100 of *B. bidwillii* × *B. grandiflorus* and 120 *B. bidwillii* × *B.* ×*carneus*, which are 2 years old and planted out in test blocks at 3 m spacing for assessment.

The next batch consists of *B. garrawayae* × *B. bidwillii*, *B. grandiflorus* × *B. velutinosus*, *B. garrawayae* × *B.* sp. Exmore Station, and *B. bidwillii* × *B.* sp. Exmore Station and consists of 300 plants that will be planted in the trial block in spring.

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