Product: Waratah
Botanical name: Telopea speciosissima
Variety: Seedlings and named cultivars
The distinctive and spectacular New South Wales waratah is also the NSW floral emblem.

Waratah blooms are harvested commercially from many distinct cultivars and seedlings, some of which have improved yields and vase life. The market is increasingly demanding the uniformity offered by the cultivars, and flowers of the same cultivar presented together.

The range of head sizes, forms and colours is increasing, and includes the traditional red, in addition to pink and white. Most are forms or hybrids of Telopea speciosissima, which occurs naturally in the Central and South Coast districts and the Blue Mountains region.

Each waratah bloom is composed of a central mass of individual flowers or florets surrounded by a ring of leaf-like bracts. The florets open (visible as the style or ‘pin’ sticking out) from the outer rim inwards. Blooms are fully open when the florets at the tip of the dome are open. The arrangement and size of bracts differs between cultivars, ranging from very large and showy to small and compact.

Market appeal is related to the shape of the bloom; the ratio of bracts to the domed mass of individual flowers and the overall appearance. For commercial growers, this requires attention during the planning phase. Different markets, and even sectors of markets, may have very different requirements.

Hybrid waratahs are available in a range of colours (including yellow) and forms. The bracts may be small or missing.

Maximum vase life is achieved if blooms are cut when the central flowers are fully formed and <5% of the individual florets have opened. Once open, florets produce significant amounts of nectar, which attracts insects and encourages the development of botrytis (grey mould fungus). Don’t add sugar to postharvest solutions, because it stimulates nectar production.

One of the most common causes of poor vase life is drying out of the blooms. Another is that the more individual flowers that are open, the shorter the vase life.

This specification describes a red T. speciosissima bloom of the best quality that can be produced by most commercial growers (traded as ‘A’ grade). Waratahs grown under shade protection may achieve a higher quality.

Small-headed blooms are a lower grade than described here and should be marketed in bunches of 3 or 5, depending on the cultivar and customer preference.

Irrigate before harvest if necessary to avoid water stress at picking.

**Flowering season:**
Late August to late October, depending on cultivar, locality and season.

**Typical vase life:**
7–14 days (some hybrids have a much shorter vase life). Export can reduce the vase life, especially if the transport conditions are not cold, the product dries out, or transport takes too long.

**Other products to which this specification can be generally applied:**

Other waratah selections include white and pink.
**Product:** Waratah ‘Songlines’

### STAGES OF OPENING

**Stage 1**  
Immature stage, unacceptable to markets

**Stage 2**  
Prime stage for export and domestic markets – 0-5% of florets open (equivalent to no more than 1 ring of florets open)

**Stage 3**  
Acceptable stage for domestic markets – 6-25% of florets open (equivalent to 2 rings of florets open)

### COMMON DEFECTS

**Common defects to be avoided at market entry:**
- Bract browning
- Overmature blooms
- Shoot grow through
- Deformed or off type blooms
- Blooms damaged by insects, e.g. bud borer
- Poor quality foliage due to insect or mechanical damage or poor crop nutrition

- Deformed bloom – do not harvest
- Bract browning (note that this is more prominent in white varieties)
- Scale insects – disinfest before harvest
- Shoot grow through
The stages shown apply to the product at market entry. The climate, season, mode and duration of transport must be considered because the flowers will continue to open during transport. You must consult with your target market to ensure the flowers arrive there at the desired stage.

Stage 4
Latest stage for domestic markets – 26-50% of florets open (equivalent to 3 or more rings of florets open)

Stage 5
Overmature stage – 51-75% of florets open: unaccepted by many markets

Stage 6
Overmature stage – 76-100% of florets open: unaccepted by most markets

- Thick stem, no bracts and shoot grow through – do not harvest
- Curved stem – do not harvest
- Leaf damage – mechanical injury
- Overmature (wilted) – do not market
- Bud borer – discard
- Leaf miner insect damage
- Insect chewed bracts and poor quality foliage – do not market
- Nutrient deficiency spoiling leaf quality – discard
## Product: Waratah

### Flowers

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Flower head fully formed, bracts fully opened (for that cultivar), and flower head opening evenly to reveal the central dome. Flower size proportional to stem length and diameter – market smaller heads on shorter stems. Flower head follows in a straight line from the stem (and is not offset from the stem at &gt;15°). Flower head not hidden by leaves. No secondary blooms or shoots growing through the head.</th>
</tr>
</thead>
<tbody>
<tr>
<td>When to harvest</td>
<td>Flower mass (dome) firm and fully swollen, and &lt;5% of florets open (when the first or outer ring of florets is open). Immature buds will not open properly. Flower head well coloured and typical for the selection. Take care when harvesting flowers if they are wet.</td>
</tr>
<tr>
<td>Damage</td>
<td>No damaged bracts, or asymmetrical, deformed or damaged blooms. Minimum blemishes such as bract browning. No folding, creasing or damage to bracts. No ‘blueing’ of flower. No wilting. Discard any poor-quality product with insects or fungal infections.</td>
</tr>
<tr>
<td>Contamination</td>
<td>Ensure the flowers are free of grit and soil, weed seeds or weeds, and signs of insects or spiders, such as webbing.</td>
</tr>
<tr>
<td>Pests and diseases</td>
<td>No apparent pest or disease damage.</td>
</tr>
</tbody>
</table>

### Leaves

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Bright green; crisp appearance. Not dull or wilted. Minimum discoloration (&lt;10% by area and affecting &lt;10% of leaves).</th>
</tr>
</thead>
<tbody>
<tr>
<td>At harvest</td>
<td>Avoid harvesting or storing when foliage is wet. Strip leaves from lower third to half of the stem, being careful not to damage the stem (a sharp snap downwards holding the thumbnail at the base of the leaf stalk usually works).</td>
</tr>
<tr>
<td>Damage</td>
<td>Minimum evidence of pests, diseases or other blemishes such as mechanical damage. Leaves entire (no insect feeding damage). No scale insects, earwigs or spiders. No spider webs. Free of visible chemical residues.</td>
</tr>
</tbody>
</table>

### Stems

<table>
<thead>
<tr>
<th>Appearance</th>
<th>Rigid and strong enough to support blooms, without being too heavy and bulky. Bend &lt;15°. Free of disfiguring trim marks or other blemishes. Neatly cut end.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>According to market demand, typically as recommended in ‘Grading and bunching’ below.</td>
</tr>
</tbody>
</table>

### Recommended Handling at Harvest

Minimise drying out and exposure to heat – pick when it is cool, preferably straight into buckets of clean potable water, ideally with added registered biocide, and hold in the shade.

Move cut stems promptly to a cool, shaded packing area and cool to 2–4 °C as soon as possible to remove field heat and to stop the bloom from continuing to open.

### Grading and Bunching

**Grading**

Flowers are generally marketed as single stems. Grade quickly to minimise time stems are out of water. Reject any contaminated stems. Sort stems according to flower maturity, length and thickness: flower head proportional to stem length (typically 20%–25% of the total stem length for larger blooms).

**Bunching**

Waratahs meeting this specification are generally marketed as single stems, unless the buyer requests otherwise. There is a greater risk of flower damage if waratahs are packed as bunches.

**Stem length**

<table>
<thead>
<tr>
<th>Stem length* (cm)</th>
<th>Diameter of flower head excluding bracts (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 cm</td>
<td>9 cm</td>
</tr>
<tr>
<td>80 cm</td>
<td>8 cm</td>
</tr>
<tr>
<td>60 cm</td>
<td>7 cm</td>
</tr>
</tbody>
</table>

* Measured from the top of the dome to the base of the stem. Because of the great variability in flower size and shape, it is not possible to give exact stem lengths required by markets.

**Sleeves**

Especially for export and for forms with long, delicate bracts, use perforated sleeves. A tight sleeve holds the bloom together and makes flowers easier to pack.
**HOLDING AND STORAGE**

**Cooling**

Effective cooling soon after harvest is important to retaining quality and maximising vase life. There are two options:

- Cool, process, cool – for example, remove field heat by cooling flowers immediately on entry into shed to 10°C in buckets of solution, process flowers (bunch, grade), and then cool to 2–4°C by either forced-air cooling (if boxed) or holding overnight in a cool room.

- Process within 1 hour of cutting, and then cool to 2–4°C by either forced-air cooling for 20–30 minutes (if boxed) or holding overnight in a cool room (if in buckets).

Forced-air cooling of packed flowers is ideal for large volumes of product.

**Temperature and humidity**

Hold in a high-humidity cool room (95%) at 2–4°C. Another way of achieving high humidity is to cover the flowers with plastic sleeves or plastic sheeting, as long as there is no condensation on the flowers, which can favour botrytis.

**Postharvest solutions**

Postharvest solution: Hold in high-quality potable water with an added biocide registered for postharvest use in cut flowers. Do not add sugar, as this stimulates nectar production, which promotes botrytis.

Holding solution: Same as the postharvest solution. If necessary, hold at 2–4°C for up to 4 days.

Recutting stems at this stage appears to be beneficial in maintaining water uptake.

To increase water uptake and improve hydration it may be worth holding the stems in deep water (e.g. 20 cm) or in special hydrating solution (see Postharvest Manual® for details).

**Longer-term storage**

For longer storage seek professional advice and test in the market before committing product.

**PACKAGING**

Pack only dry, cold flowers. Especially for export, stems in each box should be approximately the same diameter and length, and flower head size should be consistent.

Pack with flower heads at each end of the box and stems in the middle to avoid damaging blooms.

Pack stems firmly in boxes or use export hooks or stem breaks so the product will not move and be damaged. Use shredded paper to protect flower heads, unless forced-air cooling is to be used (as the paper slows cooling). Avoid packing too many stems per box.

Use boxes with holes to allow forced-air cooling.

Minimise water loss. For long-distance shipping consider lining boxes with plastic if they do not have a plastic or wax vapour barrier.

Cool flowers to 2–4°C before transport.

**LABELLING AND DOCUMENTATION**

Label boxes and buckets as recommended in Postharvest Manual or as required by customer.

Ensure box contents are exactly the same as specified in the documentation and on the end of the box.

**TRANSPORT**

Refrigerated vehicle at 2–4°C.

**COMMON POSTHARVEST PROBLEMS**

Refer to Postharvest Manual® for general advice.

- **Fungal decay in storage due to botrytis (grey mould)**
  - Use preharvest fungicide sprays during wet weather, which favours botrytis.
  - Use preharvest insecticide sprays to reduce the pest population at harvest.
  - Dip flowers that are to be packaged and held for any significant length of time (export product) in a registered fungicide and insecticide solution with added wetting agent for not less than 1 minute, then dry naturally for 2 hours to ensure thorough disinfestation. Florets produce a lot of nectar (which favours botrytis) as they open, so protection against botrytis is important.
  - Or: Fumigate flowers before dispatch to kill insects. Shake out any dead insects after fumigating and before packing.

- **Insects (for export)**
  - Use preharvest insecticide sprays to reduce the pest population at harvest.
  - Use clean buckets and containers for displays.
  - Do not display flowers in areas that are exposed to full sun, draughts, high temperatures or vehicle exhausts, and preferably do not display near fruit and vegetables. Use refrigerated displays if possible.
  - Tell the customer how to care for the flowers and emphasise the need for fresh clean water and clean vases.

**Messages for importers and wholesalers**

- Recut stems and place into fresh water containing a registered biocide and avoid adding sugar. Cool product before marketing or sending on and keep it cool (2–4°C).
- Maintain good hygiene and keep containers clean.

**Messages for retailers**

- Recut stems and place into fresh water containing a registered biocide.
- Use clean buckets and containers for displays.
- Do not display flowers in areas that are exposed to full sun, draughts, high temperatures or vehicle exhausts, and preferably do not display near fruit and vegetables. Use refrigerated displays if possible.
- Tell the customer how to care for the flowers and emphasise the need for fresh clean water and clean vases.

**Messages for consumers**

- Keep vase filled with the clean water. Check daily, as flowers can use a lot of water. Change the water at least every second day. Always use clean vases and clean water.
- Do not display in areas that are exposed to full sun, draughts or high temperatures. Keep as cool as possible without freezing.
- Discard other flower types in the same vase when they reach the end of their vase life.