Macadamia information kit
Reprint – information current in 1998

REPRINT INFORMATION – PLEASE READ!
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This publication has been reprinted as a digital book without any changes to the content published in 1998. We advise readers to take particular note of the areas most likely to be out-of-date and so requiring further research:

• Chemical recommendations—check with an agronomist or Infopest www.infopest.qld.gov.au
• Financial information—costs and returns listed in this publication are out of date. Please contact an adviser or industry body to assist with identifying more current figures.
• Varieties—new varieties are likely to be available and some older varieties may no longer be recommended. Check with an agronomist, call the Business Information Centre on 13 25 23, visit our website www.deedi.qld.gov.au or contact the industry body.
• Contacts—many of the contact details may have changed and there could be several new contacts available. The industry organisation may be able to assist you to find the information or services you require.
• Organisation names—most government agencies referred to in this publication have had name changes. Contact the Business Information Centre on 13 25 23 or the industry organisation to find out the current name and contact details for these agencies.
• Additional information—many other sources of information are now available for each crop. Contact an agronomist, Business Information Centre on 13 25 23 or the industry organisation for other suggested reading.

Even with these limitations we believe this information kit provides important and valuable information for intending and existing growers.

This publication was last revised in 1998. The information is not current and the accuracy of the information cannot be guaranteed by the State of Queensland.

This information has been made available to assist users to identify issues involved in macadamia production. This information is not to be used or relied upon by users for any purpose which may expose the user or any other person to loss or damage. Users should conduct their own inquiries and rely on their own independent professional advice.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this publication.

Queensland Horticulture Institute Department of Primary Industries, Queensland in conjunction with NSW Agriculture and Australian macadamia Society Ltd.
**Introduction**

A common problem for new macadamia growers is the correct identification of the varieties in their orchard. This is important as each variety has different characteristics that may influence the way in which it is managed. For example, the management of nutrition, pest and disease monitoring, pollination and harvest operations may all be different for some varieties. Correct identification of varieties also helps in marketing.

The *Macadamia Variety Identifier* is the first comprehensive guide to identifying the varieties likely to be planted in existing Australian orchards. It covers 24 varieties including all of the major commercial varieties originating from both Australia and Hawaii. The benchmark for inclusion of a variety is:

- either *Macadamia integrifolia* or *Macadamia integrifolia* hybrid origin;
- in commercial use;
- commercially propagated in quantities to make it likely that blocks of trees exist.

Minor varieties propagated in small numbers and those of *Macadamia tetraphylla* origin are not included.

**Layout**

The identifier consists of three sections:

- The **main identification characteristics** used and where the varieties broadly fit.
- A simple **key to varieties** based on leaf spines, leaf size and leaf shape. As leaves are always available, this allows a quick narrowing of the options at any time.
- Detailed **individual variety profiles**. The information on each variety is presented in a two-page format with the main identification characteristics on the left-hand page. Where appropriate, this enables the pages to be flicked over quickly to locate matching characteristics.

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Disclaimer

This information product is distributed by the Department of Primary Industries as an information source only. The information contained in the kit and other material incorporated by reference is provided solely on the basis that readers will be responsible for making their own assessment of the content and seek professional advice. Readers must note that the information contained in this book has been developed for growers in Queensland and New South Wales, Australia and the Department of Primary Industries gives no warranty that the information is suitable for other areas.
Meaning of terms used

Petiole – leaf stalk
Willowing of branches – branches tend to be thin and hang down
Hilum – attachment of nut to husk
Micropyle – white spot at the end of the nut opposite to the hilum where water enters to initiate germination
Raceme – flower stalk
Turkey’s neck – distinct break between main body of tree and the top
Sticktight nuts – dry mature nut-in-husk stay attached to the tree and do not fall naturally (as distinct from late fall green nuts)
Pre-germination – germination on the tree before nuts fall
Precocious – starts bearing at an early age
Undulating leaf margins – wavy leaf margins
Basal discolouring – colouring of kernel due to absorption of colour from shell
Leaf whorl – two or more leaves attached at the one node

Information on selecting varieties

Note that this book is a variety identifier – not a guide to selecting varieties for the orchard. Information on this subject can be found in the Key issues section of the Agrilink Macadamia Information Kit.

Precautions in using this guide

• Illustrations of trees, leaves and nuts have been selected as being most typical of the variety. Illustrations are also based on trees grown in south Queensland and northern New South Wales. Note that there will be some variation from these illustrations for other districts and under different management systems.
• Leaves used in the illustrations are mature leaves from the outside of the leaf canopy exposed to full sun.
• The guide is not suitable for identifying trees less than about three years of age.
• As with all identification, accuracy depends on experience.

Acknowledgements

The authors wish to sincerely thank Loraine Chapman for image scanning, artwork, page layouts and desktop publishing, and Glenis Ayling for editing the text.
The authors also acknowledge the interest and support of the Technical Development Committee of the Australian Macadamia Society in the production of this book.
Information for the book was derived principally from data collected from the regional variety trials conducted by DPI, NSW Agriculture and the Australian Macadamia Society.
Photographs used to develop the diagrams were kindly supplied by Eric Gallagher.

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Tree shape

Spreading
- A4*
- A203
- A268
- 246
- 333*

Upright
- A16*
- A38
- 344
- 791
- Own Venture

Upright with turkey’s neck
- A16*
- 814*
- A38
- 816
- 344
- 842
- 791
- Own Venture

Round
- A4*
- A16*
- H2
- NG8
- 333*

Note: Shape of these varieties varies with environment, age and tree management.

Tree density & size

Dense
- A16
- H2
- 246
- 333
- 344
- 508
- 660
- Own Choice

Open
- A4
- A38
- A203
- A268

Open when young; dense when older
- 741
- 842
- Own Choice

Small
- A16
- NG8
- 791
- 814

Medium
- A4
- A38
- A203
- A268
- 660
- 783
- 842
- 849
- Own Venture

Large
- H2
- 246
- 333
- 344
- 508
- 741
- 781
- 816
- Daddow
- Own Choice

* Shape of these varieties varies with environment, age and tree management.

Note: Tree density and size vary with environment and tree management.
Leaf length

<table>
<thead>
<tr>
<th>Short &lt;150 mm</th>
<th>Medium 150–200 mm</th>
<th>Long &gt;200 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>A16</td>
<td>A4 660</td>
<td>A268</td>
</tr>
<tr>
<td>H2</td>
<td>A38 741</td>
<td>NG8 814</td>
</tr>
<tr>
<td>344</td>
<td>A203 783</td>
<td>842</td>
</tr>
<tr>
<td>508</td>
<td>246 791</td>
<td>849</td>
</tr>
<tr>
<td>781</td>
<td>333 800</td>
<td></td>
</tr>
<tr>
<td>Own Choice</td>
<td>Daddow 816</td>
<td></td>
</tr>
<tr>
<td>Own Venture</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Leaf length varies with environment and tree age.

Leaf width; tip shape

<table>
<thead>
<tr>
<th>Narrow &lt;40 mm wide</th>
<th>Medium 40–50 mm</th>
<th>Wide &gt;50 mm wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4</td>
<td>A268</td>
<td>A16</td>
</tr>
<tr>
<td>A38</td>
<td>H2</td>
<td>A203</td>
</tr>
<tr>
<td>A203</td>
<td>NG8</td>
<td>783</td>
</tr>
<tr>
<td>NG8</td>
<td>508</td>
<td>791</td>
</tr>
<tr>
<td>344</td>
<td>814</td>
<td>800</td>
</tr>
<tr>
<td>508</td>
<td>816</td>
<td>816</td>
</tr>
<tr>
<td>660</td>
<td>Own Choice</td>
<td>Own Choice</td>
</tr>
<tr>
<td>741</td>
<td>Own Venture</td>
<td>Daddow</td>
</tr>
</tbody>
</table>

Note: Leaf width varies with environment and tree age.

Husk

Shell

Tree

Nut

Leaf

• medium to large
• moderately upright

• very dense
• raised neck
• small point in line with stalk
• tea colored, round, heavily striped

• medium length petiole
• very small micropyle

• rounded tip
• moderate spines, particularly at base
• undulating margin; some rolling at tip
• medium length

• medium
• 150 – 200 mm

• size
• medium

• length
• medium

Size

Shape

Note: Leaf width varies with environment and tree age.
### Leaf spines & husk shape

<table>
<thead>
<tr>
<th>No spines</th>
<th>One spine on tip</th>
<th>Basal spines</th>
</tr>
</thead>
<tbody>
<tr>
<td>H2</td>
<td>A38</td>
<td>344 660 741</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Few spines</th>
<th>Moderate spines</th>
<th>Many spines</th>
</tr>
</thead>
<tbody>
<tr>
<td>A16 791 A203 814</td>
<td>NG8 842 246 849</td>
<td>A4 A268</td>
</tr>
<tr>
<td>508 816 781 783</td>
<td>333 800 Daddow</td>
<td></td>
</tr>
<tr>
<td>Own Choice</td>
<td>Own Venture</td>
<td></td>
</tr>
</tbody>
</table>

### Distinctive shell features

<table>
<thead>
<tr>
<th>Distinct suture line</th>
<th>Adhering husk</th>
</tr>
</thead>
<tbody>
<tr>
<td>A16 783 A38 791</td>
<td>H2 791</td>
</tr>
<tr>
<td>344 816 660</td>
<td></td>
</tr>
<tr>
<td>741</td>
<td>Daddow</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prominent bulge</th>
<th>Pronounced flecks or stripes</th>
</tr>
</thead>
<tbody>
<tr>
<td>A4 A16</td>
<td>A4 NG8</td>
</tr>
<tr>
<td></td>
<td>A16 246</td>
</tr>
<tr>
<td></td>
<td>A203 344</td>
</tr>
<tr>
<td></td>
<td>A268 660</td>
</tr>
<tr>
<td></td>
<td>Daddow 741</td>
</tr>
<tr>
<td></td>
<td>Own Choice 783</td>
</tr>
<tr>
<td></td>
<td>Own Venture 849</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Distinct groove</th>
<th>Pointed hilum</th>
</tr>
</thead>
<tbody>
<tr>
<td>781 814 800</td>
<td>A16 Daddow</td>
</tr>
<tr>
<td>842</td>
<td>Own Venture</td>
</tr>
</tbody>
</table>

**Note:** This is a simplified key only — refer to the individual variety profiles for full details on each variety.
### Key to varieties based on leaf

<table>
<thead>
<tr>
<th>No spines</th>
<th>One spine on top</th>
<th>Basal only spines</th>
<th>Few spines</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Short</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Narrow</td>
<td>Wide</td>
</tr>
</tbody>
</table>

Note: This is a simplified key only — refer to the individual variety profiles for full details on each variety.

### spines, leaf size and leaf shape

<table>
<thead>
<tr>
<th>Few spines</th>
<th>Many spines</th>
<th>Very spiny</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long</td>
<td>Medium</td>
<td>Long</td>
</tr>
<tr>
<td>Narrow</td>
<td>Wide</td>
<td>Medium</td>
</tr>
<tr>
<td>Long</td>
<td>Wide</td>
<td>Long</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>H2 page 24</th>
<th>A38 page 18</th>
<th>344 page 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>508 page 34</td>
<td>781 page 40</td>
<td>783 page 42</td>
</tr>
<tr>
<td>741 page 38</td>
<td>A16 page 16</td>
<td>816 page 50</td>
</tr>
<tr>
<td>791 page 44</td>
<td>A203 page 20</td>
<td>814 page 48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>800 page 46</th>
<th>246 page 28</th>
<th>Own Venture</th>
</tr>
</thead>
<tbody>
<tr>
<td>842 page 52</td>
<td>849 page 54</td>
<td>A4 page 14</td>
</tr>
<tr>
<td>A268 page 22</td>
<td>333 page 30</td>
<td>NG8 page 26</td>
</tr>
</tbody>
</table>

Agrilink
**A4**

### Leaf
- long pointed tip
- very spiny
- relatively narrow
- flattened margin
- short to medium length petiole

### Tree
- • medium, spreading to rounded
- • medium, spreading to rounded
- • leaf whors fairly evenly divided between 3 and 4 leaves per node

### Nut
#### Husk
- long, moderately large point, offset to stalk

#### Shell
- oval, out of round shape; thin, smooth, shiny golden brown shell with moderate flecking

### Other characteristics

#### Flowers
- long racemes (250 – 300 mm)
- short, late, intense flowering; prone to second flowering in summer
- precocious

#### Bunching habit
- mainly singles

#### Kernel
- large, white, full, flat

#### Key identifiers
- spreading tree with open canopy
- leaf whors, some with three leaves; some with four leaves
- pale, relatively narrow, very spiny and pointed leaves
- distinctive dent near micropyle, with micropyle on slight point
- large, even sized, thin shelled, slightly oval golden brown nuts
- mainly single nuts on long racemes
**Leaf**
- slightly pointed tip with spine
- few spines
- wide

**Tree**
- small
- upright with willowing of branches
- moderate to dense canopy

**Nut**
**Husk**
- long, thin stalk
- moderate point, in line with stalk

**Shell**
- oval, thin, mahogany shell with moderate flecking
- dent near micropyle
- very small micropyle

**Length:** short 120 – 180 mm

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- condensed, late flowering

**Bunching habit**
- tends to open bunching

**Kernel**
- full, white

**Key identifiers**
- small, moderate to dense upright tree with willowing of branches
- dull green, short and wide leaves with few spines and short petiole
- thin shelled, oval mahogany nuts with a dent near a very small micropyle
- very late nut drop
- small percentage of 4 leaf whorls
- prone to sticktights
**Other characteristics**

**Flowers**
- very long racemes (more than 300 mm) with cream flowers
- short, mid-season flowering

**Bunching habit**
- tends to very long, large bunches towards the bottom centre of the tree

**Kernel**
- slightly flattened, cream
- high percentage of whole kernels

---

**Key identifiers**
- very long racemes
- shortish narrow leaves with only one spine on apical tip
- tends to very long, large bunches towards bottom centre of tree
- very upright tree with very open canopy
- medium to large, uniform, round nuts
- tends to long willowy branches in later years

---

**Leaf**
- one spine on pointed apical tip
- narrow
- slightly undulating margin

**Tree**
- medium
- very open canopy
- very upright with willowing of branches in later years

**Nut**

**Husk**
- moderate point, offset to stalk
- medium thick stalk
- large neck

**Shell**
- round, light brown, glossy shell with slight flecking
- suture line
- very small micropyle

**Size:**
- uniform medium to large

**Length:**
- short – medium
- 140 – 160 mm
A203

**Leaf**
- slightly pointed tip
- longish, dull with few spines
- narrow
- margin rolls down toward tip
- long petiole

**Tree**
- medium
- slightly upright with slight willowing of branches
- moderate to open canopy

**Nut**

**Husk**
- rough surface
- moderately long, thick stalk
- large point, in line with stalk
- large neck

**Shell**
- glossy, slightly rough surface with flecking
- slight dent near micropyle
- very small micropyle

**Size**: medium to large
**Length**: medium – long 150 – 230 mm

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- intense, short, mid-season flowering

**Bunching habit**
- old trees tending to singles with no large bunches

**Kernel**
- full, white

**Key identifiers**
- slightly pointed, longish, narrow, dull, medium green leaves with few spines and long petiole
- slight dent near very small micropyle
- medium to large, uneven sized nut
- intense, short late flowering
- rough surface on husk and nut
- slightly upright tree with slight willowing of branches
A268

**Leaf**
- pointed tip
- many spines
- wide and long
- undulations in margin towards tip
- short petiole

**Tree**
- medium to large
- spreading habit
- moderate to open canopy

**Nut**

**Husk**
- small point, offset to stalk
- very slightly raised neck

**Shell**
- even sized pebbly to rough shell with moderate flecking
- very small micropyle

**Size**:
- very large

**Length**:
- long
- 200 – 250 mm

---

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- short, condensed mid-season flowering

**Bunching habit**
- tendency to single nuts

**Kernel**
- full, creamy white

---

**Key identifiers**
- long leaf with many spines and short petiole
- medium to large spreading tree with moderate to open canopy
- leaves much larger than A4
- small point on husk with thin stalk
- very large, even sized nut with small micropyle and slightly rough surface
Husk
- flattened, with very small point, offset to stalk
- no neck

Shell
- distinct lobed shape
- slightly flat, aborted embryo mark (dimple)
- large hilum with piece of adhering husk
- medium to large micropyle

Tree
- large, upright
- dense canopy

Nut
- flat margin with rolled down tip
- short to medium petiole

Length: short < 150 mm

Other characteristics

Flowers
- medium racemes (150 – 200 mm) with some branching possible
- late, short flowering

Bunching habit
- prone to tight bunches
- prone to sticktight nuts and pre-germination

Kernel
- flat with moderate ridge
- many whole kernels

Key identifiers
- small, slightly flattened nuts with distinctive lobe, dimple, medium to large micropyle and large hilum with piece of adhering husk
- short, wide leaf with rounded end, no spines, flat margin with rolled down tip
- medium to long racemes with some branching
- shell with thick base
- prone to sticktight nuts
- large, dense, upright tree
NG8

**Leaf**
- pointed tip
- many spines (particularly near base)
- long, narrow leaf
- slight undulations on margin
- short petiole

**Tree**
- very small, round
- open canopy
- moderately precocious — starts bearing early

**Nut**

**Husk**
- dark green
- medium to large point, offset to stalk
- short, thin stalk
- very small neck

**Shell**
- bright brown shell with moderate flecking
- raised at micropyle end
- small micropyle

**Size:**
- medium to large

**Length:**
- long 200 – 250 mm

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- intense, late flowering

**Bunching habit**
- some open bunches, mainly singles
- nuts hang down on long racemes

**Kernel**
- medium to large
- very few whole kernels — mostly halves

**Key identifiers**
- very small, open, round tree
- very dark green, long, narrow leaves
- nuts prominent; hang singly on long racemes
- bright brown nuts with moderate flecking
- tend to dehusk on the ground
- precocious — starts bearing early; high yield per canopy area
- very few whole kernels — mostly halves
- dehusks on the ground
**246**

<table>
<thead>
<tr>
<th>Leaf</th>
<th>Tree</th>
<th>Other characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Husk</strong></td>
<td>short, thick stalk</td>
<td><strong>Flowers</strong></td>
</tr>
<tr>
<td>small point, offset to stalk</td>
<td>extended, heavy flowering</td>
<td></td>
</tr>
<tr>
<td><strong>Shell</strong></td>
<td>slightly rough surface with moderate flecking</td>
<td>precocious — starts bearing early</td>
</tr>
<tr>
<td>slightly flattened</td>
<td><strong>Bunching habit</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Nut</strong></td>
<td>large neck</td>
<td>few bunches of nuts</td>
</tr>
<tr>
<td>medium to long petiole</td>
<td>mainly singles — increasing tendency as trees age</td>
<td></td>
</tr>
<tr>
<td><strong>Other characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Key identifiers</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>large tree with spreading growth habit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>regular, very even undulating margin on dark green wide leaf</td>
<td></td>
</tr>
<tr>
<td></td>
<td>short racemes and extended flowering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>short, thick stalk</td>
<td></td>
</tr>
<tr>
<td></td>
<td>medium to large nut with large micropyle</td>
<td></td>
</tr>
</tbody>
</table>

**Flowers**
- short – medium racemes (less than 100 – 200 mm)
- extended, heavy flowering
- precocious — starts bearing early

**Bunching habit**
- few bunches of nuts
- mainly singles — increasing tendency as trees age

**Kernel**
- slightly flat with a prominent ridge
- tendency to basal discolouring

**Length**: medium 150 – 200 mm

**Key identifiers**
- large tree with spreading growth habit
- regular, very even undulating margin on dark green wide leaf
- short racemes and extended flowering
- short, thick stalk
- medium to large nut with large micropyle
**Leaf**
- pointed tip
- many spines
- medium to long, very wide leaf
- large undulations in margin
- medium to long petiole
- very dark green

**Tree**
- medium
- round to spreading
- moderately dense canopy

**Nut**
**Husk**
- large point, offset to stalk
- very short, thick stalk
- very tough husk
- large neck

**Shell**
- slightly rough surface with minimal flecking
- slightly flattened with thick shell
- small to medium micropyle

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- mid to late flowering of moderate intensity

**Bunching habit**
- mainly singles

**Kernel**
- slightly flat

**Key identifiers**
- medium to long, very wide, spiny, very dark green shiny leaves with undulating margins
- round tree
- tough, pale green husk
- very short, thick stalk
- small point on husk
- thick shell
**Flowers**
- medium length racemes (150 – 200 mm)
- mid to late, light flowering
- precocious — starts bearing early

**Bunching habit**
- tends to tight bunches, particularly with light flowering

**Kernel**
- flat, ridged, dull cream

**Key identifiers**
- large, upright, conical, dense tree
- short, narrow, dark green leaves with few spines
- light flowering
- small point on husk in line with stalk
- no neck on husk, short thick stalk
- compact and very dense tree when young
**Leaf**
- rounded tip
- few spines
- short, narrow
- many short undulations on margin
- medium to long petiole

**Tree**
- large, spreading
- moderate to dense canopy

**Nut**

**Husk**
- small point, offset to stalk
- glossy
- short, moderately thick stalk
- moderate neck

**Shell**
- round
- small micropyle (can be open)

**Length**: short <150 mm

**Size**: medium

**Other characteristics**

**Flowers**
- medium racemes (150 – 200 mm)
- late, long flowering

**Bunching habit**
- tending to singles
- can have sticktight nuts

**Kernel**
- full, white

**Key identifiers**
- very large, spreading tree
- short leaves with rounded tip, few spines and many small undulations
- small, round nuts
- small point on husk
- susceptible to yellowing and leaf scald under heat stress
### Key identifiers
- very dark green, narrow, slightly pointed leaves with spines mainly near the base
- long petiole
- small nuts, variable in size
- upright tree with turkey’s neck
- very early nut drop; tends to germinate in wet conditions

Note: It is very difficult to distinguish between 660 and 741.
### 741

#### Leaf
- pointed tip
- slightly undulating margin
- relatively narrow, particularly towards base
- distinctive, spurred, basal spines
- long petiole

#### Tree
- large, upright
- moderate to open canopy
- turkey’s neck

#### Nut

<table>
<thead>
<tr>
<th><strong>Husk</strong></th>
<th><strong>Shell</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>medium to long thick stalk</td>
<td>round, smooth shell with slight flecking</td>
</tr>
<tr>
<td>moderate neck</td>
<td>small micropyle</td>
</tr>
</tbody>
</table>

**Length:** medium
150 – 200 mm

**Size:** medium

#### Other characteristics

**Flowers**
- medium racemes (150 – 200 mm)
- prone to light flowering
- late, concentrated flowering

**Bunching habit**
- numerous open bunches

**Kernel**
- full, slightly dull, cream

**Key identifiers**
- distinctive spurred basal spines on leaves (more than 344 or 660)
- large, upright tree; moderate to open canopy with turkey’s neck, particularly when young
- late, concentrated light flowering
- numerous open bunches
- large point on husk, offset to stalk

Note: It is very difficult to distinguish between 660 and 741
**Leaf**
- rounded tip with no point
- some large spines
- wide
- slightly undulating margin
- variable size petiole
- yellowing of summer flush under heat stress

**Tree**
- very large, moderately upright
- moderately dense canopy

**Nut**
- Husk: round, smooth
- thick, medium length stalk
- very small point offset to stalk
- small neck

- Shell: large, round, slightly flecked
- flat at hilium
- distinct groove (not suture)
- medium micropyle

**Length:** short <150 mm

**Other characteristics**

**Flowers**
- short – medium racemes (100 – 200 mm)
- light, late flowering

**Bunching habit**
- mainly singles, doubles, triples

**Kernel**
- medium to large

**Key identifiers**
- very large, moderately upright tree; moderately dense canopy
- short, wide, slightly undulating leaves with some spines and some yellowing on summer flush (caused by heat intolerance)
- large kernel but low yield to canopy area
- long, late nut drop; prone to sticktight nuts
- large nuts, but can be variable
**783**

### Leaf
- Rounded tip
- Slightly undulating margin
- Medium width
- Few spines mainly at base
- Medium petiole

**Length**: Medium 150 – 200 mm

### Tree
- Medium to large spreading
- Moderately dense canopy

### Nut

**Husk**
- Round, dull, dark surface
- Very small point offset to stalk
- Prominent ridge at dehiscing point
- Thick, medium length stalk
- Raised neck
- Medium micropyle

**Shell**
- Round, even nut; moderately flocked, some whiteish
- Distinct suture line

**Size**: Medium

### Other characteristics

**Flowers**
- Medium racemes (150 – 200 mm)
- Extended flowering; more intense late in season

**Bunching habit**
- Many clusters

**Kernel**
- Medium
- High percentage of whole kernels

**Key identifiers**
- Medium to large, moderately dense, spreading tree
- Relatively narrow leaves with rounded tip, small undulations and a few spines at base
- Small point to husk; thick stalk with raised neck
- Prominent ridge on husk at dehiscing point
- Moderate flecking; some nuts are whitish
- Distinct suture line on nut
**Flowers**
- long racemes (200 – 250 mm)
- extended flowering throughout most of the year

**Bunching habit**
- loose bunches with many doubles and triples

**Kernel**
- flattish and oblong
- prominent ridge

**Key identifiers**
- small, upright, irregular, straggly tree
- longish, narrow leaves with pronounced tip and slightly undulating margins
- slightly cupped leaves with short petiole
- extended flowering through most of the year
- small point on husk in line with stalk
- round tan coloured nut, slightly flattened at hilum with no flecking
- leaves not evenly spaced on the whorl
Leaf
- slightly pointed tip
- many large spines
- medium width
- regular undulating margin

Tree
- large, very spreading
- very dense canopy
- wide lateral limb structure when compared to 246
- prone to twisted branches (caused by copper deficiency)

Nut
- Husk
  - medium length petiole
  - paler than 246
  - medium thick stalk
  - large neck

- Shell
  - slightly rough surface
  - distinct groove (not suture)
  - medium micropyle

Other characteristics
- Length: medium
  - 150 – 200 mm
- Size: large

Key identifiers
- large, very spreading, dense tree; highly prone to wind damage
- regular undulating margin and many large spines on leaves
- leaves narrower and paler than 246
- slightly rough nut surface with moderately large micropyle
- prone to twisted branches
- round, white kernels

Flowers
- long racemes (200 – 250 mm)
- long flowering

Bunching habit
- singles to triples

Kernel
- round, white

Flowers
- long racemes (200 – 250 mm)
- long flowering

Bunching habit
- singles to triples

Kernel
- round, white
**Husk**
- very small point offset to stalk
- short, thick stalk
- no neck

**Shell**
- round with slight flecking
- transverse groove (not from micropyle to hilum)
- medium hilum
- medium micropyle

**Size**: small
**Length**: long
200 – >250 mm

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**Flowers**
- long racemes (200 – 250 mm)
- short, light, late flowering

**Bunching habit**
- many small bunches

**Kernel**
- small, round

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**Key identifiers**
- small, upright, open, precocious tree
- long, wide, dull mid-green leaves with uneven undulating margin
- small, round, even-sized nuts
- many small bunches of nuts
**Leaf**
- medium to large
- moderately upright
- moderately dense canopy

**Tree**
- medium to large
- moderately upright
- moderately dense canopy

**Nut**
- Husk
  - medium point offset to stalk
  - slightly rough surface; pale lime green
  - average length, thick stalk
  - large, raised neck
- Shell
  - round with little flecking
  - distinct suture
  - small to medium micropyle
- Size: medium to large
- Length: medium
  - 150 – 200 mm

**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- light, late flowering

**Bunching habit**
- mostly singles and doubles

**Kernel**
- large, round with high kernel recovery
- good percentage of whole kernels

**Key identifiers**
- medium to large, moderately upright tree with moderately dense canopy
- pale lime green leaves with smooth margin or only a few spines and long petiole
- light, late flowering with early nut drop
- large, lime green nut in husk, with raised neck and thick stalk
- pale nut with prominent suture
**Other characteristics**

**Flowers**
- long racemes (200 – 250 mm)
- intense flowering over long period

**Bunching habit**
- mainly two or three nuts, with small clusters
- nuts tend to be concentrated towards the centre of the tree

**Kernel**
- small to medium, round

**Key identifiers**
- medium to large, moderately upright tree
- long, very wide leaves with many spines and small regular undulations on the margin
- very even, round, small, smooth nut in husk with very small point offset to a very short stalk and small neck
- intense, flowering over long period
- lighter leaf colour than 849
**Other characteristics**

**Flowers**
- medium racemes (180 – 220 mm)
- light, late flowering over short period

**Bunching habit**
- mainly two or three nuts, tending to small bunches as tree gets older

**Kernel**
- dull, cream, similar to 246
- slightly flat
- good percentage of whole kernels

**Key identifiers**
- medium to large, spreading tree
- long, wide, dark green leaves, wider at the tip with many spines and very undulating margins
- light flowering over short period
- round nut with flattened area at hilum and slight to moderate flecking
- late maturing nuts tend to pre-germinate
- veins raised on upper leaf surface
**Leaf**
- Rounded tip
- Moderate spines, particularly at base
- Wide
- Undulating margin; some rolling at tip

**Tree**
- Medium to large
- Moderately upright
- Very dense

**Nut**
- Husk:
  - Dull, dark green; slightly rough
  - Small point in line with stalk
  - Medium stalk
  - Very well defined, raised neck

- Shell:
  - Tea coloured, round, heavily striped
  - Large hilum
  - Very distinct suture
  - Very small micropyle

**Other characteristics**

**Flowers**
- Short racemes (100 – 150 mm)
- Moderately intense, mid to late flowering

**Bunching habit**
- Many bunches with three to four nuts

**Kernel**
- Round with moderate ridge

**Key identifiers**
- Medium to large, upright to slightly spreading, very dense tree
- Wide, undulating, moderately spiny leaves with some rolling and mottling on older leaves
- Very prominent hilum and suture on nuts, which looked cracked
- Short racemes with moderately intense mid to late flowering
- Extended late nut drop
- Mature leaves dull and dark green; young leaves light green in colour

**Note:** Leaf width varies with environment and tree age.
### Leaf
- rounded tip
- few spines
- medium width
- slightly rolling undulating margin
- medium length petiole

**Leaf**
- Length: short – medium
- 140 – 160 mm

### Tree
- • large, round
- • very dense canopy

### Nut
**Husk**
- very large point offset to stalk
- very dark green
- short, thick stalk
- moderate neck

**Shell**
- slightly oval, golden brown shell with moderate flecking
- slight dent from hilum to micropyle
- small to medium micropyle

**Length:** short – medium
**Size:** large

### Other characteristics

**Flowers**
- short racemes (100 – 150 mm)
- extended out of season flowering

**Bunching habit**
- tending to single nuts
- prone to sticktight nuts and pre-germination

**Kernel**
- full, white

### Key identifiers
- large, round, very dense tree
- pale to medium green leaves with few spines and slightly rolling, undulating margin
- very extended flowering and nut drop pattern
- prone to sticktight nuts and pre-germination
- slightly oval, tan nuts with slight dent from hilum to micropyle
- low dense tree skirt
Own Venture

**Leaf**
- Slightly pointed tip
- Many spines
- Medium width
- Small, regular undulating margin

**Tree**
- Medium to large
- Moderately upright
- Open canopy when young, more dense with age

**Nut**

**Husk**
- Large point offset to stalk
- Long thin stalk
- Medium neck
- Dull, spotted

**Shell**
- Heavy flecking
- Small micropyle

**Key identifiers**
- Long relatively narrow, spiny leaves
- Heavy flecking on shells
- Large nut
- Very dense tree when mature
- Late nut drop with a tendency to sticktights
- Light green leaf colour

**Other characteristics**

**Flowers**
- Long racemes (200 – 250 mm)
- Short, late flowering

**Bunching habit**
- Singles and doubles
- Tendency to sticktights

**Kernel**
- Large, flat, slightly oblong, variable in shape

**Length**
- Long
- 200 – 250 mm
Introduction

A common problem for new macadamia growers is the correct identification of the varieties in their orchard. This is important as each variety has different characteristics that may influence the way in which it is managed. For example, the management of nutrition, pest and disease monitoring, pollination and harvest operations may all be different for some varieties. Correct identification of varieties also helps in marketing.

The Macadamia Variety Identifier is the first comprehensive guide to identifying the varieties likely to be planted in existing Australian orchards. It covers 24 varieties including all of the major commercial varieties originating from both Australia and Hawaii. The benchmark for inclusion of a variety is:

- either Macadamia integrifolia or Macadamia integrifolia hybrid origin;
- in commercial use;
- commercially propagated in quantities to make it likely that blocks of trees exist.

Minor varieties propagated in small numbers and those of Macadamia tetraphylla origin are not included.

Layout

The identifier consists of three sections:

- The main identification characteristics used and where the varieties broadly fit.
- A simple key to varieties based on leaf spines, leaf size and leaf shape. As leaves are always available, this allows a quick narrowing of the options at any time.
- Detailed individual variety profiles. The information on each variety is presented in a two-page format with the main identification characteristics on the left-hand page. Where appropriate, this enables the pages to be flicked over quickly to locate matching characteristics.

Tree shape is for a tree 5 to 7 years old

Note: Tree, leaf and nut illustrations are derived from photos and have been selected as being most typical of the variety. Note that there will be some variation from these illustrations.

Leaf size is in scale throughout the book. Upper leaf surface is shown in all cases.