Four New Macadamia Varieties for Australia

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3Hidden Valley Plantations (HVP)

**Background**
- Australian macadamia industry - >AU$200 M
- World’s largest producer 2016
- Current industry varieties mainly Hawaiian and HVP
- Current varieties are large trees and slow economic break even

**Trial Design**
- 8 Regional Variety Trial sites in QLD and NSW planted 2008 and 2009
- 20 Industry, 5 standard and 5 HVP varieties
- Harvested from 2013 - 2016
- Disease and insect evaluation
- Oil profile, shelf life and sensory analysis

**Selection Process**
- MET Analysis and BLUPs of yield and tree data collected for 4 years
- Benchmarking data valued a dollar change in trait
- 20 year economic trait modelling
- Industry advisory committee make the final decision on release
- Plant Breeder’s Rights applications

**Variety Traits**

**Variety ‘G’**
- Precocious and high canopy efficiency
- Medium to tall spreading tree
- All-rounder for Bundaberg and Northern Rivers
- Mid to late season nut drop

**Variety ‘P’**
- Small to medium size, spreading tree
- Precocious, produces similar yield to HAES 741 on a tree 33% smaller
- Late season nut drop

**Variety ‘J’**
- Precocious and highly productive
- Medium to large tree
- Ranked 2 at Booyan RVT
- Mid – late season nut drop
- High kernel recovery

**Variety ‘R’**
- Suited to Northern Rivers, NSW
- Performs well on coastal plain, NSW
- Out-yielding HAES 246 at year 6
- Medium size tree, late season nut drop

**Yield and Tree Comparison for Booyan, Bundaberg**

<table>
<thead>
<tr>
<th>Variety</th>
<th>G</th>
<th>P</th>
<th>J</th>
<th>816</th>
<th>741</th>
<th>344</th>
<th>246</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kernel Recovery (%)</td>
<td>47.9</td>
<td>38.9</td>
<td>44</td>
<td>40.2</td>
<td>38.3</td>
<td>14.2</td>
<td>18.9</td>
</tr>
<tr>
<td>Kernel Canopy Efficiency (g/m²)</td>
<td>114</td>
<td>123</td>
<td>106</td>
<td>95</td>
<td>78</td>
<td>83</td>
<td>91</td>
</tr>
<tr>
<td>Tree Volume (m³)</td>
<td>40.4</td>
<td>31.4</td>
<td>40.5</td>
<td>39.2</td>
<td>49</td>
<td>37.7</td>
<td>45</td>
</tr>
<tr>
<td>Kernel kg per ha (estimated)</td>
<td>1147</td>
<td>1147</td>
<td>1147</td>
<td>1147</td>
<td>1147</td>
<td>1147</td>
<td>1147</td>
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<tr>
<td>Kernel kg per ha (estimated)</td>
<td>91</td>
<td>91</td>
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<tr>
<td>Estimated 20 year DCF for 1ha of orchard</td>
<td>$105,874</td>
<td>$149,641</td>
<td>$147,308</td>
<td>$132,359</td>
<td>$126,640</td>
<td>$80,156</td>
<td>$136,351</td>
</tr>
</tbody>
</table>

1. Cumulative Kernel Yield 2012 - 2016
2. 2016 (year 8) Kernel Canopy Efficiency
3. Estimated kernel yield (kg/ha) for 322.5 trees per ha at year 8
4. Estimated kernel yield (kg/ha) for 800 trees per ha at year 8
5. Year 20 Discounted Cash Flow for 1ha of orchard (average of standards $125,126)

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Valued assistance from Rachel Abel (DAF), Rod Daley (DAF), Paul O’Hare (DAF), Craig Maddox (NSW DPI) David Robinson (NSW DPI), Lindsay Bryen, Russ Stevenson and RVT site managers throughout QLD and NSW.