Occupational Health & Safety Risk in the Horticulture Industries

–THE FACTS –

2005

Facts and Figures on Farm Health and Safety Series No 3

Australian Centre for Agricultural Health and Safety
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1. Introduction

Agriculture and horticulture enterprises produce commodities of more than $30 billion value per annum on around 135,000 enterprises spread across all states of Australia. However, that production is associated with a high cost in terms of human injury. High rates of serious injury and deaths on Australian farms are of concern to agricultural industry bodies, farmers, workers and farm enterprises and federal and state governments.

Farmsafe Australia, the national association of agencies with a commitment to reducing injury risk on Australian farms, is working with the horticultural industries to implement the Health and Safety in the Horticultural Industry: An Industry Strategy 2004-2009.

Strategic approaches to reducing farm injury risk are multifaceted and include:
- identifying elimination and substitution options
- improving design and engineering solutions
- administrative or work practice solutions, including education and skills development
- identification of requirements for personal protective clothing and equipment
- identification of incentives for adoption of improved systems
- ensuring compliance with regulatory requirements for supply of safe plant and equipment and safe operation in the farm workplace.

This document has been produced to provide guidance to those agencies and individuals who are working to reduce risk associated with horticultural production in Australia. The publication is available electronically for use by educators and speakers in their efforts to raise awareness and promote horticultural production safety, and for those whose role is the development of public and industry policy to improve safety.
Horticultural production – fruit, vegetable and flower production - is currently carried out on an estimated 22,460 rural properties in Australia. Horticultural establishments comprise approximately 16% of all Australian agricultural enterprises. Table 1 indicates the number of commercial enterprises reporting undertaking horticultural production in 2002.

Table 1  Establishments undertaking agricultural activity, Australia 30 June 2002

<table>
<thead>
<tr>
<th></th>
<th>NSW</th>
<th>Vic.</th>
<th>Qld.</th>
<th>SA</th>
<th>WA</th>
<th>Tas</th>
<th>NT</th>
<th>ACT</th>
<th>Aust.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant nurseries</td>
<td>858</td>
<td>340</td>
<td>625</td>
<td>130</td>
<td>189</td>
<td>52</td>
<td>21</td>
<td>5</td>
<td>2,220</td>
</tr>
<tr>
<td>Cut flower/flower seed</td>
<td>263</td>
<td>224</td>
<td>185</td>
<td>87</td>
<td>140</td>
<td>38</td>
<td>9</td>
<td>-</td>
<td>945</td>
</tr>
<tr>
<td>Vegetable growing</td>
<td>831</td>
<td>1,011</td>
<td>1,379</td>
<td>513</td>
<td>517</td>
<td>545</td>
<td>9</td>
<td>-</td>
<td>4,805</td>
</tr>
<tr>
<td>Grape growing</td>
<td>1,220</td>
<td>2,243</td>
<td>167</td>
<td>2,448</td>
<td>628</td>
<td>444</td>
<td>176</td>
<td>-</td>
<td>6,833</td>
</tr>
<tr>
<td>Apple/pear growing</td>
<td>176</td>
<td>307</td>
<td>108</td>
<td>154</td>
<td>137</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>919</td>
</tr>
<tr>
<td>Stone fruit growing</td>
<td>435</td>
<td>294</td>
<td>114</td>
<td>195</td>
<td>178</td>
<td>41</td>
<td>-</td>
<td>1</td>
<td>1,258</td>
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<tr>
<td>Kiwi fruit growing</td>
<td>24</td>
<td>4</td>
<td>3</td>
<td>-</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>34</td>
<td></td>
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<tr>
<td>Fruit growing nec</td>
<td>1,881</td>
<td>510</td>
<td>2,018</td>
<td>560</td>
<td>318</td>
<td>43</td>
<td>116</td>
<td>-</td>
<td>5,446</td>
</tr>
<tr>
<td>Grain growing</td>
<td>4,193</td>
<td>2,996</td>
<td>1,715</td>
<td>4,120</td>
<td>2,851</td>
<td>33</td>
<td>2</td>
<td>-</td>
<td>15,911</td>
</tr>
<tr>
<td>Grain-sheep/beef cattle</td>
<td>6,669</td>
<td>2,824</td>
<td>1,289</td>
<td>1,915</td>
<td>2,860</td>
<td>52</td>
<td>-</td>
<td>1</td>
<td>15,610</td>
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<tr>
<td>Sheep-beef cattle</td>
<td>3,726</td>
<td>2,288</td>
<td>867</td>
<td>795</td>
<td>453</td>
<td>269</td>
<td>-</td>
<td>26</td>
<td>8,424</td>
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<tr>
<td>Sheep farming</td>
<td>5,588</td>
<td>4,218</td>
<td>444</td>
<td>1,515</td>
<td>1,436</td>
<td>679</td>
<td>-</td>
<td>30</td>
<td>13,911</td>
</tr>
<tr>
<td>Beef cattle farming</td>
<td>10,722</td>
<td>7,698</td>
<td>11,285</td>
<td>1,234</td>
<td>1,893</td>
<td>1,048</td>
<td>211</td>
<td>19</td>
<td>34,110</td>
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<tr>
<td>Dairy cattle farming</td>
<td>1,615</td>
<td>6,696</td>
<td>1,292</td>
<td>590</td>
<td>358</td>
<td>580</td>
<td>3</td>
<td>1</td>
<td>11,135</td>
</tr>
<tr>
<td>Poultry farming (meat)</td>
<td>339</td>
<td>186</td>
<td>126</td>
<td>67</td>
<td>58</td>
<td>14</td>
<td>14</td>
<td>-</td>
<td>790</td>
</tr>
<tr>
<td>Poultry farming (eggs)</td>
<td>130</td>
<td>152</td>
<td>84</td>
<td>30</td>
<td>61</td>
<td>18</td>
<td>5</td>
<td>1</td>
<td>481</td>
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<tr>
<td>Pig farming</td>
<td>399</td>
<td>192</td>
<td>328</td>
<td>124</td>
<td>87</td>
<td>27</td>
<td>1</td>
<td>-</td>
<td>1,159</td>
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<tr>
<td>Horse farming</td>
<td>631</td>
<td>389</td>
<td>516</td>
<td>1,57</td>
<td>129</td>
<td>53</td>
<td>-</td>
<td>3</td>
<td>1,777</td>
</tr>
<tr>
<td>Deer farming</td>
<td>28</td>
<td>38</td>
<td>**</td>
<td>21</td>
<td>**</td>
<td>11</td>
<td>-</td>
<td>-</td>
<td>125</td>
</tr>
<tr>
<td>Livestock nec</td>
<td>311</td>
<td>133</td>
<td>194</td>
<td>14</td>
<td>66</td>
<td>6</td>
<td>2</td>
<td>-</td>
<td>725</td>
</tr>
<tr>
<td>Sugar cane growing</td>
<td>521</td>
<td>**</td>
<td>4,219</td>
<td>-</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>4,747</td>
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<tr>
<td>Cotton growing</td>
<td>321</td>
<td>-</td>
<td>375</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>697</td>
</tr>
<tr>
<td>Crop/plant nec</td>
<td>214</td>
<td>536</td>
<td>616</td>
<td>130</td>
<td>108</td>
<td>190</td>
<td>11</td>
<td>1</td>
<td>1,806</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>41,092</td>
<td>33,282</td>
<td>27,900</td>
<td>14,654</td>
<td>12,499</td>
<td>3,953</td>
<td>395</td>
<td>93</td>
<td>133,868</td>
</tr>
</tbody>
</table>

Source: Australian Bureau of Statistics. Agricultural Commodities, Australia, 2001-02 (7121.0).

Figure 1  Area under production of vegetables, fruit and nuts and grapes, Australia (1994/95-2001/02)

Source: ABS (2002)
Table 2 indicates the causes of non-intentional traumatic death of those persons whose occupation at time of death was farmer, farm manager or farm worker, for the years 1999 to 2002, and covers claims from all agricultural industries including horticultural enterprises. The data does not include fatalities of visitors such as children or students or other occupational groups such as tradespersons or contractors working in the farm workplace but does include injury deaths associated with on-road transportation accidents.

Table 2: Causes of injury deaths of those whose occupation was farm manager or agricultural worker who died 1999-2002, Australia (ICD 10-AM)

<table>
<thead>
<tr>
<th>Code No</th>
<th>Descriptions</th>
<th>99</th>
<th>00</th>
<th>01</th>
<th>02</th>
<th>Z</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>V01-09</td>
<td>Pedestrian injured in transport accidents</td>
<td>8</td>
<td>14</td>
<td>15</td>
<td>7</td>
<td>44</td>
<td>5.3</td>
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<tr>
<td>V10-19</td>
<td>Pedal cyclist injured in transport accidents</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>V20-29</td>
<td>Motor cycle rider injured in transport accidents</td>
<td>9</td>
<td>4</td>
<td>10</td>
<td>10</td>
<td>33</td>
<td>4.0</td>
</tr>
<tr>
<td>V30-39</td>
<td>Occupant of three wheeled motor vehicle injured in transport accident</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>V40-49</td>
<td>Car occupant injured in transport accident</td>
<td>50</td>
<td>57</td>
<td>54</td>
<td>68</td>
<td>229</td>
<td>27.8</td>
</tr>
<tr>
<td>V50-59</td>
<td>Occupant of pick-up truck or van injured in transport accident</td>
<td>2</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>10</td>
<td>1.2</td>
</tr>
<tr>
<td>V60-69</td>
<td>Occupant of heavy transport vehicle injured in transport accident</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>V80-89</td>
<td>Other land transport accidents</td>
<td>27</td>
<td>12</td>
<td>19</td>
<td>19</td>
<td>77</td>
<td>9.3</td>
</tr>
<tr>
<td>V80</td>
<td>Animal ridden</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>V84</td>
<td>Special vehicle mainly used in agriculture(tractors)</td>
<td>10</td>
<td>7</td>
<td>10</td>
<td>6</td>
<td>33</td>
<td>4.0</td>
</tr>
<tr>
<td>V86</td>
<td>Special all-terrain vehicle(ATV)</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>8</td>
<td>20</td>
<td>2.4</td>
</tr>
<tr>
<td>V90-94</td>
<td>Water transport accidents</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>6</td>
<td>0.7</td>
</tr>
<tr>
<td>V95-97</td>
<td>Air &amp; space transport accidents</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>11</td>
<td>1.3</td>
</tr>
<tr>
<td>W00-19</td>
<td>Falls</td>
<td>15</td>
<td>10</td>
<td>25</td>
<td>13</td>
<td>63</td>
<td>7.6</td>
</tr>
<tr>
<td>W20-49</td>
<td>Exposure to inanimate mechanical forces</td>
<td>17</td>
<td>19</td>
<td>8</td>
<td>17</td>
<td>61</td>
<td>7.4</td>
</tr>
<tr>
<td>W20</td>
<td>Struck by thrown, projected or falling object</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>20</td>
<td>2.4</td>
</tr>
<tr>
<td>W23</td>
<td>Caught, crushed, jammed, pinched in or between objects</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>W25</td>
<td>Contact with sharp glass</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>W29</td>
<td>Other powered hand tools &amp; household machinery</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>W30</td>
<td>Contact with agricultural machinery</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>13</td>
<td>1.6</td>
</tr>
<tr>
<td>W31</td>
<td>Contact with other and unspecified machinery</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td>W33-34</td>
<td>Fires</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>4</td>
<td>16</td>
<td>1.9</td>
</tr>
<tr>
<td>W50-64</td>
<td>Exposure to animate mechanical forces</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>5</td>
<td>0.6</td>
</tr>
<tr>
<td>W65-74</td>
<td>Accidental drowning &amp; submersion</td>
<td>5</td>
<td>4</td>
<td>11</td>
<td>5</td>
<td>25</td>
<td>3.0</td>
</tr>
<tr>
<td>W75-84</td>
<td>Other accidental threats to breathing</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>8</td>
<td>19</td>
<td>2.3</td>
</tr>
<tr>
<td>W85-99</td>
<td>Exposure to electric current, radiation and external ambient air temperature &amp; pressure</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>1.0</td>
</tr>
<tr>
<td>X00-X09</td>
<td>Exposure to fire, smoke &amp; flames</td>
<td>4</td>
<td>5</td>
<td>8</td>
<td>6</td>
<td>23</td>
<td>2.8</td>
</tr>
<tr>
<td>X10-X19</td>
<td>Contact with heat &amp; hot substances</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>X20-29</td>
<td>Contact with venomous animals &amp; plants</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>0.4</td>
</tr>
<tr>
<td>X30-39</td>
<td>Exposure to forces of nature</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>0.5</td>
</tr>
<tr>
<td>X40-49</td>
<td>Accidental poisoning</td>
<td>16</td>
<td>9</td>
<td>9</td>
<td>4</td>
<td>38</td>
<td>4.6</td>
</tr>
<tr>
<td>X50-57</td>
<td>Overexertion, travel &amp; privation</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0.1</td>
</tr>
<tr>
<td>X58-59</td>
<td>Accidental exposure to other &amp; unspecified factors</td>
<td>28</td>
<td>38</td>
<td>26</td>
<td>42</td>
<td>134</td>
<td>16.2</td>
</tr>
<tr>
<td>Y85-89</td>
<td>Sequelae of external causes of morbidity &amp; mortality</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>2</td>
<td>16</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: NFIDC ABS Deaths Database (HOIST NSW Health)

*Excludes road traffic deaths, medical misadventure and poisoning by medicinals

3. Injury deaths—all agriculture sectors
Figure 2 demonstrates the relative contribution of causes of injury deaths of Australian farmers and farm workers across all industries, for the period 1990-1998. This data excludes all road traffic injury.

Figure 2 Causes of non-intentional injury deaths* of farmers and farm workers, Australia 1990-98 (n=912)

Source: NFIDC ABS Deaths Database (HOIST NSW Health)
*Excludes road traffic deaths, medical misadventure and poisoning by medicinals

Although the proportion of these deaths relating specifically to horticultural producers or workers is not known, many of the injury risks are shared in common between specific groups in the agriculture sector, and hence the available data should be considered to be broadly relevant to horticulture industries.
4. Deaths on horticulture production farms

Tables 3 and 4 show details of non-intentional traumatic deaths on Australian farms for the period 1989-1992, where there were 20 deaths that occurred on fruit producing farms and another 21 deaths on vegetable producing properties. This equates to 10.25 deaths per annum to produce $5,973 million gross value product (2001/02, ABS 2002), or 1.7 deaths per $1 million gross value product.

Deaths were associated with a range of agents, the prime one being the tractor (27% of all deaths).

### Table 3  Agent of fatal incident on orchards & other fruit farms, by work status, Australia 1989-1992

<table>
<thead>
<tr>
<th>Agent</th>
<th>Working</th>
<th>Bystander</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trailer</td>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Tractor</td>
<td>4</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Slasher</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Ladder</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Firearm</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Timber</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Dam/irrigation channel</td>
<td>-</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Other farm structures</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10</strong></td>
<td><strong>10</strong></td>
<td><strong>20</strong></td>
</tr>
</tbody>
</table>

*Source: Franklin et al. (1989-1992)*

### Table 4  Agent of fatal incident on vegetable* producing farms, by work status, Australia 1989-1992

<table>
<thead>
<tr>
<th>Agent</th>
<th>Working</th>
<th>Bystander</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Truck/car</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Tractor</td>
<td>4</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Tillage seeder</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Posthole digger</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Other mobile plant</td>
<td>-</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Electric drill</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Dam</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Embankment</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Powerlines</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Horse</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Snake</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>18</strong></td>
<td><strong>3</strong></td>
<td><strong>21</strong></td>
</tr>
</tbody>
</table>

*Source: Franklin et al. (1989-1992)  *Includes potatoes

Although the data above is more than 10 years old, the number of deaths of farmers/farm workers has shown no downward trend between 1992 and 2001, suggesting that the information may be relevant. The major change during this period has been the increased use of ATVs, which at time of publication are associated with around 10 on-farm deaths per annum.

**Tractor safety** is a priority for injury prevention programs in the horticultural industry. While the introduction of ROPS legislation may reduce rollover deaths, runover hazard remains a high risk.
5. Workers’ compensation claims

Australia-wide there were 4,316 workers’ compensation claims made in the year 2002 for injury in the agriculture sector. Of these, more than 1,378 (32%) were in the horticulture and fruit growing industries.

Table 5  Incidence of workers’ compensation claims*, Australia 2002

<table>
<thead>
<tr>
<th>Industry</th>
<th>Incidence per 1000 workers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Female</td>
</tr>
<tr>
<td>Horticulture &amp; Fruit Growing</td>
<td>15.9</td>
</tr>
<tr>
<td>Grain, Sheep &amp; Beef Cattle Farming</td>
<td>7.8</td>
</tr>
<tr>
<td>Dairy Cattle Farming</td>
<td>11.8</td>
</tr>
<tr>
<td>Poultry Farming</td>
<td>38.6</td>
</tr>
<tr>
<td>Other Livestock Farming</td>
<td>53.5</td>
</tr>
<tr>
<td>Other Crop Growing</td>
<td>35.1</td>
</tr>
<tr>
<td>All agriculture</td>
<td>15.7</td>
</tr>
<tr>
<td>All industries</td>
<td>11.6</td>
</tr>
</tbody>
</table>

Source: NOSI2 Databases, NOHSC website January 2005
*Duration of absence was greater than one week & excluding travel claims

Figure 3  Number of workers’ compensation claims (all)* and total gross value of product (vegetables/fruit and nuts/grapes) for horticultural industry, Australia 1994/95-2001/02

The trend of number of claims since 1994/95 has been increasing, although the rate of claims in the sector may well be different in light of the changes in production in that time.
The large proportion of workers’ compensation claims are associated with use of non-powered hand-tools and equipment and with environmental agencies. Mobile plant and equipment are also important.

**Table 6** Number of workers’ compensation claims* in the horticulture and fruit growing industries, Australia 1995/96-2000/01

<table>
<thead>
<tr>
<th>Breakdown Agency</th>
<th>Female</th>
<th>Male</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; (mainly) fixed plant</td>
<td>108</td>
<td>350</td>
<td>458</td>
</tr>
<tr>
<td>Mobile plant &amp; transport</td>
<td>256</td>
<td>930</td>
<td>1186</td>
</tr>
<tr>
<td>Powered equipment, tools &amp; appliances</td>
<td>35</td>
<td>147</td>
<td>182</td>
</tr>
<tr>
<td>Non-powered hand-tools, appliances &amp; equipment</td>
<td>648</td>
<td>1746</td>
<td>2394</td>
</tr>
<tr>
<td>Chemicals &amp; chemical products</td>
<td>27</td>
<td>109</td>
<td>136</td>
</tr>
<tr>
<td>Materials &amp; substances</td>
<td>224</td>
<td>577</td>
<td>801</td>
</tr>
<tr>
<td>Environmental agencies</td>
<td>681</td>
<td>1352</td>
<td>2033</td>
</tr>
<tr>
<td>Animal, human &amp; biological agencies</td>
<td>48</td>
<td>122</td>
<td>170</td>
</tr>
<tr>
<td>Other &amp; unspecified agencies</td>
<td>520</td>
<td>937</td>
<td>1457</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2547</strong></td>
<td><strong>6270</strong></td>
<td><strong>8817</strong></td>
</tr>
</tbody>
</table>

*Duration of absence was greater than one week & excluding travel claims

A more specific breakdown of claims for the period 1994/95 to 1999/00, shows that the following are the dominant agencies of associated injury/illness claims (numbers):

<table>
<thead>
<tr>
<th>Mobile plant and transport</th>
<th>Tractors</th>
<th>244</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Trailers</td>
<td>124</td>
</tr>
<tr>
<td></td>
<td>Trolleys/handcarts</td>
<td>73</td>
</tr>
<tr>
<td></td>
<td>Ploughs/harrows/cultivators</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Self propelled harvesters</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>Conveyor belts and escalators</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Power hoists</td>
<td>45</td>
</tr>
<tr>
<td></td>
<td>Forklift trucks</td>
<td>70</td>
</tr>
<tr>
<td></td>
<td>Trucks</td>
<td>92</td>
</tr>
<tr>
<td></td>
<td>Cars and utilities</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>Motorcycles</td>
<td>62</td>
</tr>
<tr>
<td>Powered equipment</td>
<td>Chainsaws</td>
<td>32</td>
</tr>
<tr>
<td>Outdoor environment</td>
<td>Holes in ground – outdoor</td>
<td>126</td>
</tr>
<tr>
<td></td>
<td>Wet oily traffic area</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Fencing</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Vegetation</td>
<td>869</td>
</tr>
<tr>
<td></td>
<td>Traffic area</td>
<td>348</td>
</tr>
<tr>
<td>Non-powered handtools and equipment</td>
<td>Knives</td>
<td>256</td>
</tr>
<tr>
<td></td>
<td>Scissors</td>
<td>209</td>
</tr>
<tr>
<td></td>
<td>Shovels, spades</td>
<td>65</td>
</tr>
<tr>
<td></td>
<td>Fastening, packaged/fastening equipment</td>
<td>385</td>
</tr>
</tbody>
</table>

All of the above need to be considered in programs to improve safety in the horticultural industries.
7. Mechanism of injury of workers’ compensation claims

Table 7 below indicates that the dominant mechanisms of injury in the horticulture industries for the period 1995/96-1999/00 are body stressing, followed by trips and falls and being hit by moving object.

Table 7  Workers’ compensation claims* in the horticulture and fruit growing industries, by mechanism and agency of injury, Australia 1995/96–1999/00

<table>
<thead>
<tr>
<th>Breakdown Agency</th>
<th>Falls, trips &amp; slips of a person</th>
<th>Hitting objects</th>
<th>Hit by moving objects</th>
<th>Sound &amp; pressure</th>
<th>Body stressing</th>
<th>Heat, radiation</th>
<th>Electricity</th>
<th>Chemicals</th>
<th>Biological factors</th>
<th>Mental stress</th>
<th>Other &amp; unspecified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; (mainly) fixed plant</td>
<td>58</td>
<td>53</td>
<td>172</td>
<td>#</td>
<td>78</td>
<td>8</td>
<td>#</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>8</td>
<td>380</td>
</tr>
<tr>
<td>Mobile plant &amp; transport</td>
<td>273</td>
<td>73</td>
<td>321</td>
<td>#</td>
<td>199</td>
<td>#</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>139</td>
<td>1014</td>
</tr>
<tr>
<td>Powered equipment, tools</td>
<td>#</td>
<td>38</td>
<td>45</td>
<td>0</td>
<td>59</td>
<td>9</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>#</td>
<td>155</td>
<td></td>
</tr>
<tr>
<td>Non-powered handtools, &amp; equipment</td>
<td>549</td>
<td>387</td>
<td>256</td>
<td>#</td>
<td>828</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>18</td>
<td>2041</td>
</tr>
<tr>
<td>Chemicals</td>
<td>6</td>
<td>0</td>
<td>8</td>
<td>0</td>
<td>41</td>
<td>#</td>
<td>62</td>
<td>0</td>
<td>0</td>
<td>#</td>
<td>124</td>
<td></td>
</tr>
<tr>
<td>Materials &amp; substances</td>
<td>36</td>
<td>58</td>
<td>109</td>
<td>0</td>
<td>414</td>
<td>16</td>
<td>8</td>
<td>#</td>
<td>0</td>
<td>#</td>
<td>647</td>
<td></td>
</tr>
<tr>
<td>Environmental agencies</td>
<td>821</td>
<td>101</td>
<td>92</td>
<td>13</td>
<td>639</td>
<td>#</td>
<td>35</td>
<td>0</td>
<td>0</td>
<td>53</td>
<td>1756</td>
<td></td>
</tr>
<tr>
<td>Animal, human &amp; biological agencies</td>
<td>12</td>
<td>7</td>
<td>44</td>
<td>0</td>
<td>29</td>
<td>#</td>
<td>34</td>
<td>#</td>
<td>#</td>
<td>#</td>
<td>141</td>
<td></td>
</tr>
<tr>
<td>Other &amp; unspecified</td>
<td>117</td>
<td>60</td>
<td>87</td>
<td>10</td>
<td>635</td>
<td>7</td>
<td>10</td>
<td>13</td>
<td>22</td>
<td>330</td>
<td>1292</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1875</strong></td>
<td><strong>777</strong></td>
<td><strong>1134</strong></td>
<td><strong>33</strong></td>
<td><strong>2922</strong></td>
<td><strong>52</strong></td>
<td><strong>150</strong></td>
<td><strong>19</strong></td>
<td><strong>27</strong></td>
<td><strong>560</strong></td>
<td><strong>7550</strong></td>
<td></td>
</tr>
</tbody>
</table>


*Duration of absence was greater than one week & excluding travel claims
# Less than 5 cases

Safety programs in the horticultural industries should address manual handling and ergonomic hazards.
# 8. Noise and hearing loss

Noise on farms has been well established as posing risk of noise induced hearing loss and tinnitus in farmers and farm workers. The following table indicates the noise levels with recommended exposure limits for a range of relevant activities on rural properties.

### Table 8  Average noise levels and recommended exposure limits for common farm machinery and activities

<table>
<thead>
<tr>
<th>Machinery/Worker Position during normal operating conditions</th>
<th>Noise level at operator’s ear&lt;br&gt; Average &amp; Range (95% CI)&lt;br&gt; $L_{eq}$, dB(A)</th>
<th>Recommended exposure limits without hearing protection.&lt;br&gt; <strong>NB:</strong> Noise exposure risk for each activity in the day is cumulative toward the overall noise exposure risk.**.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air compressors</td>
<td>86 (77-95)</td>
<td>7 hrs (15 mins - 8 hrs+)</td>
</tr>
<tr>
<td>All terrain vehicles (ATVs)</td>
<td>86 (84-87)</td>
<td>7 hrs (4 - 8 hrs)</td>
</tr>
<tr>
<td>Angle grinders</td>
<td>98 (96-100)</td>
<td>20 mins (15 - 30 mins)</td>
</tr>
<tr>
<td>Others in workshop</td>
<td>90 (87-93)</td>
<td>2 hrs (1 - 5 hrs)</td>
</tr>
<tr>
<td>Augers</td>
<td>93 (89-96)</td>
<td>1 hr (30 mins – 3 hrs)</td>
</tr>
<tr>
<td>Bench grinders</td>
<td>99 (94 - 104)</td>
<td>18 mins (5 mins - 1 hr)</td>
</tr>
<tr>
<td>Others in workshop</td>
<td>89 (82.96)</td>
<td>3 hrs (40 mins - 8 hrs)</td>
</tr>
<tr>
<td>Bulldozers</td>
<td>99 (97-100)</td>
<td>18 mins (15 - 30 mins)</td>
</tr>
<tr>
<td>Chainsaws</td>
<td>106 (104 - 107)</td>
<td>3 mins (2 - 5 mins)</td>
</tr>
<tr>
<td>Others stacking wood</td>
<td>96 (93-99)</td>
<td>40 mins (15 - 50 mins)</td>
</tr>
<tr>
<td>Circular saws</td>
<td>99 (98-101)</td>
<td>18 mins (10 - 20 mins)</td>
</tr>
<tr>
<td>Others in workshop</td>
<td>89 (84-94)</td>
<td>3 hrs (1-8 hrs)</td>
</tr>
<tr>
<td>Cotton module press</td>
<td>86 (85-88)</td>
<td>6 hrs (4 – 8 hrs)</td>
</tr>
<tr>
<td>Cotton picker</td>
<td>81 (78 – 85)</td>
<td>8 hrs (8 hrs+)</td>
</tr>
<tr>
<td>Farm trucks</td>
<td>85 (83-88)</td>
<td>8 hrs (4 - 8 hrs)</td>
</tr>
<tr>
<td>Forklifts</td>
<td>84 (81-88)</td>
<td>8 hrs (4 - 8 hrs)</td>
</tr>
<tr>
<td>Firearms</td>
<td>Lpk 140+ dB</td>
<td>no exposure</td>
</tr>
<tr>
<td>Harvesters</td>
<td>83 (75 - 91)</td>
<td>8 hrs (2 - 8 hrs)</td>
</tr>
<tr>
<td>Irrigation pumps</td>
<td>100 (96 - 104)</td>
<td>15 mins (5 -30 mins)</td>
</tr>
<tr>
<td>Motorbikes - 2 wheel</td>
<td>81 (70-92)</td>
<td>8 hrs (1.5 - 8 hrs+)</td>
</tr>
<tr>
<td>Packing shed workers</td>
<td>80 (78-82)</td>
<td>8 hrs (8 hrs+)</td>
</tr>
<tr>
<td>Sugarcane harvester</td>
<td>86</td>
<td>7 hrs</td>
</tr>
<tr>
<td>Tractors with cabins</td>
<td>76 (75 - 78)</td>
<td>no limit</td>
</tr>
<tr>
<td>Av. increase with radio on</td>
<td>3 - 5 dB</td>
<td>8 hrs (8 hrs+)</td>
</tr>
<tr>
<td>Others in field</td>
<td>85 (80 - 90)</td>
<td>8 hrs (2 - 8 hrs+)</td>
</tr>
<tr>
<td>Tractors without cabins</td>
<td>92 (90 - 93)</td>
<td>1.5 (1 - 2 hrs)</td>
</tr>
<tr>
<td>Others in field</td>
<td>82 (78 - 86)</td>
<td>8 hrs (6 - 8 hrs+)</td>
</tr>
</tbody>
</table>


**For example: If exposed to noisy activity for half the recommended daily limit (e.g. Angle grinder for 10 min of a 20 min daily limit), the remaining noise exposure in the day should not exceed half the recommended daily limit for another activity (e.g. A limit of 4 hrs instead of 8hr on a tractor with a radio).**

Cattle property managers need to ensure that all workers are protected from damaging noise levels.
The horticultural industries have long been identified as being heavily dependent on pesticide use, where plant treatment chemicals such as insecticides, herbicides and fumigants are important for both pre and post harvest treatments.

While data which reveals the full extent of the adverse health effects associated with pesticides is limited, workers’ compensation claims data suggest that workers in the horticultural and fruit growing industries may be at greater risk of pesticide exposure than other agricultural industries (Table 9).

Table 9 Number of workers’ compensation claims* associated with plant and animal treatment chemicals, by agricultural industry, Australia 2001-2003p

<table>
<thead>
<tr>
<th>Industry</th>
<th>Plant treatment chemicals</th>
<th>Animal treatment chemicals</th>
<th>All chemical products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Horticulture &amp; fruit growing</td>
<td>20</td>
<td>np</td>
<td>37</td>
</tr>
<tr>
<td>Grain, sheep &amp; beef cattle</td>
<td>np</td>
<td>9</td>
<td>21</td>
</tr>
<tr>
<td>Dairy cattle</td>
<td>0</td>
<td>0</td>
<td>np</td>
</tr>
<tr>
<td>Poultry</td>
<td>0</td>
<td>0</td>
<td>np</td>
</tr>
<tr>
<td>Other livestock</td>
<td>0</td>
<td>0</td>
<td>np</td>
</tr>
<tr>
<td>Other crop</td>
<td>np</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>25</strong></td>
<td><strong>12</strong></td>
<td><strong>78</strong></td>
</tr>
</tbody>
</table>

Source: NOS12 Database, NOHSC website January 2005. 2003p=incomplete year

*Duration of absence was greater than one week

Safe handling of pesticides is a priority for action in the horticultural industries.
References


Contacts

**Australian Centre for Agricultural Health & Safety**

and

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**National Farmers Federation**

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Ph (02) 6273-3855

[www.nff.org.au](http://www.nff.org.au)
Agriculture and horticulture enterprises produce commodities of more than $30 billion value per annum on around 135,000 enterprises spread across all states of Australia. However, that production is associated with a high cost in terms of human injury. High rates of serious injury and deaths on Australian farms are of concern to agricultural industry bodies, farmers, workers and farm enterprises and federal and state governments.

This document has been produced to provide guidance to those agencies and individuals who are working to reduce risk associated with horticultural production in Australia. The publication is also available electronically for use by educators and speakers in their efforts to raise awareness and promote horticultural production safety, and for those whose role is the development of public and industry policy to improve safety.

Downloads can be obtained from:

www.rirdc.gov.au