Australian plague locust
Date 5 September 2016

Identification and biology

The Australian plague locust (*Chortoicetes terminifera*) is a native insect found throughout Australia. It usually inhabits pastoral regions in relatively low numbers, but with favourable weather conditions, numbers can increase greatly and locusts can migrate into agricultural regions.

The immature or hopper stage locusts damage mainly pastures in farming areas and gardens and lawns in domestic areas. They tend to avoid established green crops, although the edges of crops can be damaged. Adult locusts can form swarms and fly into other areas, damaging pastures, ripening crops, grapevines, fruit trees and tree seedlings. If crops have completely dried off before locusts begin flying, the possibility of damage is considerably less.

Description

Adult Australian plague locusts are between 24 and 40 mm long. They vary in colour from light to dark shades of green to brown. Plague locusts have a dark blotch at the outer edge of the hind wing, and the inside of the hind legs are red in colour (Figure 1). Both adults and hoppers all have a distinctive cross on the thorax i.e. on their neck (Figure 2).

Figure 1. Adult locusts. Note the dark spot on the wing and red coloured inner hind legs.

Figure 2. Arrow indicates X-shaped marking

Hoppers and locusts can be easily confused with other native grasshoppers.

Landholder Locust Control

Landholders are responsible for control of locusts on their property. The Department of Agriculture and Food is committed to provide timely and relevant information to landholders to assist them with decisions on control.

Supporting your success
Monitoring
Prior to implementing control, it is a good idea to determine the density of the locusts on your property so that you can target areas that require spraying. The best time of day to monitor for locusts is from mid-morning and until mid-afternoon, as this is when they are most active.

Hoppers and adults
Take one A4 piece of paper, drop it on the ground. If it is windy, peg the paper down. Count how many hoppers land on it in 30 seconds. Multiply this number by 12, and this is the approximate number of hoppers per square metre. Repeat this three or four times in the paddock. Newly hatched hoppers can be difficult to see with the naked eye. You can identify if you have the Australian plague locust on your property by using a sweep net. Sweep 5-10 cm off the ground and if there are any hoppers present, they should be easy to see in the net, easy to remove and identify.

Locust swarms
Walk 100 m into the paddock and count how many adult locusts are flying. Then at right angles to where you have walked, walk a further 20 m and continue to count flying locusts.

Egg beds
Locusts favour areas of compact, bare soil to lay eggs in. If you see locusts with their abdomens in the ground, this suggests females are laying eggs. If the egg bed is on your property monitor it regularly during spring through to autumn, as this is when hatchings occur depending on conditions. Eggs may hatch simultaneously or if conditions for hatching are marginal, hatchings may occur over several weeks. Once eggs begin to hatch, monitor other areas on your property for locusts.

Reporting
- Landholders are encouraged to report where locusts are found via the department’s PestFax Reporter app. Visit www.agric.wa.gov.au and search for ‘Pestfax.

Information on locust identification, monitoring and control is available from www.agric.wa.gov.au/locusts or by phoning the Pest and Disease Information Service on 1800 084 881.

Management
Applying insecticide over entire paddocks may be necessary to prevent extensive damage from locusts. To achieve effective control, the best time to apply an insecticide is when locusts are hoppers. Treating small areas of dense masses of hoppers immediately after hatching can also be worthwhile, but will only control a relatively small proportion of the total numbers within a paddock and may involve several sprays as hatching times are staggered. If locust swarms do form, they should be controlled when they first fly into an area where their feeding will cause damage. It is important that you are aware of the likelihood of locusts flying onto your property and to stay vigilant. Sprays must be applied directly onto the locusts and the vegetation on which they are feeding. Barrier spraying to keep locusts out of an area is not effective.

Pastures
Pastures that tend to remain greener longer such as lucerne and long-season annual pastures are at greater risk of attack. Consider monitoring these pastures first. Implement control measures if pasture is valued at the cost of replacement feed for livestock and locust numbers exceed the following thresholds:
- 20 hoppers per square metre,
- 10 adult locusts per square metre
Adult locusts may fly into a paddock and although their stay may be short, they can still consume a considerable amount of pasture. If there are **25 or more locusts in flight** this suggests high locust numbers. It may not be possible to effectively protect pasture in these situations, as locust swarms will need to be sprayed aerially within hours of them arriving. Monitor frequently from spring onwards, if large infestations are in your area.

**Grain Crops**
Crops such as wheat, barley, and particularly oats, are susceptible to damage from locusts. Established green crops tend to be avoided by hoppers, although the edges of crops can be damaged. However, crops that are beginning to dry off when locusts begin to fly are especially susceptible to damage. Monitor crop edges frequently from mid-October onwards, if large infestations are in or near your area.

**Hopper and adult locust numbers should be closely monitored, and if any damage is seen, then spraying should start immediately.**

**Control**
Only insecticides that are registered or have special permits for use against the Australian plague locust can be used. It is important that directions relating to rates of application, safety issues, and withholding periods for harvest, grazing and slaughter of stock are followed. Also be aware that when applying insecticides, buffer zones should be observed around sensitive areas, such as dwellings and dams. Refer to the label for recommended buffer zones. Also consider the downwind buffer for high risk sensitive areas, e.g. aquaculture facilities.

**Grazing withholding periods**
Withholding periods (WHP) that appear on the label for grazing apply only to domestic markets. **If stock are destined for export**, the Export Animal Feed Interval (EAFI), Export Slaughter Interval (ESI) and Export Grazing Interval (EGI) must be followed.

For further information see [www.safemeat.org](http://www.safemeat.org)
If you are using any chemicals from the synthetic pyrethroid (SP) group (these include alpha-cypermethrin, beta-cyfluthrin, lamda-cyhalothrin and gamma-cyhalothrin) on drying pasture, be aware that EGI does not commence until the next break of the season. If stock are expected to be turned off before the break of the next season and alternative feed is unlikely to be available, then it is best not to use synthetic pyrethroids.

**Tank mixing**
Tank mixing insecticides registered for locust control with herbicides, will decrease the cost of the application. However, for incompatible mixes check the product label. If in doubt conduct a jar test i.e. in a screw top jar, add 500 mL of water and for every 1L/ha to be applied in the field add 10 mL of product. Cap the jar, shake well and leave overnight. Look for any chemical incompatibilities. Some settling of powdered products is normal, however, sediments should re-suspend in solution, once the jar is shaken.

**Alternative to chemical control**
A naturally occurring fungus, *Metarhizium anisopliae*, known commercially as Green Guard, has shown potential in the control of the Australian plague locust. This fungus is appropriate for use in sensitive areas and on organic farms. It is not suitable for use in tank mixes with other pesticides. The fungus should be applied when the hoppers are in the early instars so there is time for it to kill a large proportion of the locusts. Unlike other pesticides it takes several days to have an effect.
Contact

- Department of Agriculture and Food, WA www.agric.wa.gov.au/locusts
- Local DAFWA offices throughout the State; Pest and Disease Information Service (phone 1800 084 881 or email info@agric.wa.gov.au)
- Australian Pesticides and Veterinary Medicines Authority (www.apvma.gov.au)
- Safemeat (www.safemeat.com.au) A website with information on Export Slaughter Intervals, Export Grazing Intervals and Export Animal Feed Intervals

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Australian plague locust

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Insecticides

Chemicals registered or permitted for the control of the Australian Plague Locust in Western Australia

- There are many products with different trade names that contain the same active ingredient. This list is not exhaustive and does not imply any specific recommendations of brand names.


- Withholding period (WHP) number of days are given for: (H) harvest withholding period. For grazing WHPs refer to chemical label and export withholding period (ESI, EGI, EAFI). Intervals are listed in days.

- Avoid overspraying stock. Refer to labels for withholding grazing periods for domestic markets. For animals destined for export: if overspraying does occur, withhold stock for slaughter until the export slaughter interval (ESI) on clean feed is met. Or the export grazing interval (EGI) on treated crops/pasture. EAFI (export animal feeding interval) is the minimum period that must elapse between application and grazing or harvesting of crop or pasture for feed. It is the least preferred interval option as there is considerable variability in decline of residues in mature pastures.

- Many products are dangerous to fish and crustaceans. Do not contaminate ponds, rivers or waterways and do not spray flowering crops when bees are foraging.

- Use of permitted chemicals is restricted to crops for which there are current registrations for other pests. Rates of application must not exceed the label rate for each crop.

- Alternatives to chemical control are available.
## Read chemical label before application

<table>
<thead>
<tr>
<th>Chemical formulation and concentration</th>
<th>Trade name</th>
<th>Pastures</th>
<th>Cereals</th>
<th>Canola or Lupin or Pulse crops (mL/ha)</th>
<th>Forestry or Non-crop areas (mL/ha)</th>
<th>Harvest and Grazing Withholding period (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alpha-cypermethrin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC 100 g/L</td>
<td>Alpha, Alpha-C, Alpha-Cy, Alpha-Cypermethrin, Alpha, Duo, Alpha-Scud Elite, Alphasip, Astound Duo, Buzzard, Centaur, Dictate Duo, Dominex Duo, Fastac Duo, Ken-Tac, Unialphacyper</td>
<td>160</td>
<td>160</td>
<td>160-200</td>
<td>300</td>
<td>7-28(H) ESI 42 EGI 56</td>
</tr>
<tr>
<td>ULV 16 g/L</td>
<td>Alpha-Scud ULV, Dictate ULV Dominex ULV</td>
<td>1000</td>
<td>1000</td>
<td>1000-1250</td>
<td>1250-2500</td>
<td>21-28(H) ESI 42 EGI 56</td>
</tr>
<tr>
<td>SC 250 g/L</td>
<td>Conquest Alpha Forte 250 SC</td>
<td>64</td>
<td>64-80</td>
<td>64-80</td>
<td>N/A</td>
<td>7-28(H) ESI 42 EGI 56</td>
</tr>
<tr>
<td><strong>Beta-cyfluthrin</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>EC/ULV 25 g/L</td>
<td>Bulldock Duo</td>
<td>200</td>
<td>200-400</td>
<td>200-400</td>
<td>N/A</td>
<td>7-14(H) ESI 42 EGI 56</td>
</tr>
<tr>
<td><strong>Carbaryl</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SC 500 g/L</td>
<td>Bugmaster, Carbaryl</td>
<td>1200-1400</td>
<td>1200-1400</td>
<td></td>
<td></td>
<td>3(H) EAFI 7 EGI 7</td>
</tr>
<tr>
<td><strong>Chlorpyrifos</strong></td>
<td></td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>EC 500 g/L</td>
<td>Chlorpyrifos, Cyren, Fortune, Generifos, Konsban, Lorsban, Pest Controller, Strike Out</td>
<td>350 **</td>
<td>350 **</td>
<td>350 canola</td>
<td>140-300 lupin/pulse</td>
<td>10(H) EGI 56 ESI 56</td>
</tr>
<tr>
<td><strong>Cypermethrin</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC 200 g/L</td>
<td>Boom, Cypermethrin 200, Cypershield 200, Ken-Cypher, Scud Elite, Sonic</td>
<td>170</td>
<td></td>
<td>160-200</td>
<td></td>
<td>7-28(H) ESI 63</td>
</tr>
<tr>
<td>EC 250 g/L</td>
<td>Apache, Boom Plus, Cypermethrin 250</td>
<td>135</td>
<td></td>
<td>160-200</td>
<td></td>
<td>7-28(H) ESI 63</td>
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<tr>
<td>EC 260 g/L</td>
<td>Cypermethrin 260</td>
<td>130</td>
<td></td>
<td>120-200</td>
<td></td>
<td>7-28(H) ESI 63</td>
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<tr>
<td>ULV 40 g/L</td>
<td>Scud ULV plus other 40 g/L registered products</td>
<td></td>
<td></td>
<td>1000-1250</td>
<td></td>
<td>7-28(H) ESI 63</td>
</tr>
<tr>
<td><strong>Diazinon</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC 800 g/L</td>
<td>Diazinon, Diazol</td>
<td>700</td>
<td>700</td>
<td>700</td>
<td></td>
<td>14(H) EAFI 14 ESI 14 EGI 28</td>
</tr>
<tr>
<td><strong>Fenithrothon</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EC/ULV 1000 g/L</td>
<td>Fenithrothon</td>
<td>270 – 400</td>
<td>270 – 400</td>
<td></td>
<td></td>
<td>14(H) EAFI 14 ESI 14 EGI 14</td>
</tr>
</tbody>
</table>
### Fipronil

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Strength</th>
<th>Active Ingredient</th>
<th>Package Rate</th>
<th>Net Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>200 g/L</td>
<td>Regent 200SC</td>
<td>6.25</td>
<td></td>
</tr>
<tr>
<td>ULV</td>
<td>3.0 g/L</td>
<td>Adonis 3UL (Restricted use)</td>
<td>420</td>
<td></td>
</tr>
</tbody>
</table>

Subject to APVMA permits 10927, 10928 expiring 30 June 2025. Use of these chemicals will be restricted to crops for which there are current registrations for other pests. Rates of application must not exceed the label rate for each crop.

* Incompatible in tank mixes with 2, 4-D Esters, 2, 4-D Amines, MCPA Ester, Dicamba.

** Should not be tank mixed with any other pesticide

### Biological control – naturally occurring Australian fungus Metarhizium anisopliae var. anisopliae***

<table>
<thead>
<tr>
<th>Formulation</th>
<th>Strength</th>
<th>Active Ingredient</th>
<th>Package Rate</th>
<th>Net Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>SC</td>
<td>150 g / 1.8kg</td>
<td>Green Guard SC</td>
<td>75 g of spores / 150-450 L water</td>
<td>40 250</td>
</tr>
<tr>
<td>ULV</td>
<td>300 g/L</td>
<td>Green Guard ULV</td>
<td>75 g of spores / 150-450 L water</td>
<td>40 250</td>
</tr>
</tbody>
</table>

Further information

- Local DAFWA offices throughout the State; Pest and Disease Information Service (phone 1800 084 881 or email info@agric.wa.gov.au)

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Pastures

Hopper and adult locusts can cause considerable damage to pastures. It is estimated that 20 hoppers per square metre eat the equivalent of three to five sheep per hectare each day. Damage to pastures by locusts will affect both the quantity and quality of pasture. Locusts will consume green pastures and pastures that have begun drying off.

Hoppers develop over six to eight weeks, depending on temperature. If green or drying pasture is available over this period, hoppers may complete their development at one locality and consume most of the pasture. Adult locusts may fly into a paddock and although their stay may be short, they can still consume a considerable amount of pasture. It may not be possible to effectively protect pasture in these situations.

Perennial pastures such as lucerne, long-season annual pastures and newly-sown pastures are at greater risk from locust damage later in the season, as they tend to remain greener for longer periods.

Locust attack has the potential to destroy one to two year old tagasaste and to strip older trees.

Growers need to identify high value pasture paddocks for special emphasis on control measures. These include newly sown pastures, pastures set aside for specialist seed production and lucerne. Any degradation to pastures caused by locusts may subsequently result in erosion in prone paddocks. Consideration needs to be given to the increased erosion risk on sandy soils if vegetative cover is removed. This may subsequently limit opportunities for grazing.

Treatment of locust swarms will need to be within hours of them arriving, which means frequent monitoring from spring onwards, if large infestations are in your area.

Withholding periods for livestock grazing and slaughter should be observed at all times.
Management Options

- Hopper control in pastures is economic if hopper densities exceed 20 per square metre, if pasture is valued at the cost of replacement feed for livestock.
- Adult locust control in pastures is economic if locust densities exceed 10 per square metre.
- Other factors to consider in the decision to spray locust hoppers in pasture include:
  - Pasture availability – whether there is a surplus or deficit of pasture on the farm.
  - Stage of pasture growth – green pastures and pastures that are drying off are very susceptible to hopper attack, but pastures that have completely dried off are not favoured.
  - When the pasture has completely dried off, other green plant material in the paddock or nearby may be damaged, for example, tree seedlings.
- If you consider it necessary to spray for locusts check chemical options and withholding periods.
- Abide by the withholding period in sprayed paddocks.

Where possible, the over-spraying of stock should be avoided. Otherwise, withholding periods apply.

- Consider spray-topping or hay-freezing additional low-value pasture paddocks. You will need to consider the relative costs of these pasture management treatments versus spraying locusts – which is the cheapest?
- Consider grazing or spraying established lucerne or other perennial pastures prior to locust attack.

Strategies to consider include:

- Reducing carrying capacity by selling livestock and/or agistment.
- Fodder conservation by making silage, hay and sacrificing crops.
- Supplementary feeding in conjunction with estimates of feed reserves, feed budgeting, retaining grain and lot feeding.
- Fodder conservation by making silage, hay and sacrificing crops.
- Supplementary feeding in conjunction with estimates of feed reserves, feed budgeting, retaining grain and lot feeding.
Further information

- Local DAFWA offices throughout the State; Pest and Disease Information Service (phone 1800 084 881 or email info@agric.wa.gov.au)

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**Grain crops**

During spring and summer, insecticides can be used by landholders to control locust infestations that could cause crop damage. Green crops are susceptible to damage. Locusts prefer cereals such as wheat, barley and oats however lupins, canola, chickpeas, field peas and faba beans could also be damaged.

Established green crops tend to be avoided by hoppers, although the edges of crops can be damaged. Crops that are beginning to dry off when locusts begin to fly are susceptible to damage; locusts cause little if any damage to crops that have dried off.

Even slight damage to grain crops could justify the costs of control. As a general rule, hopper and adult numbers should be closely monitored, and if any damage is seen, then spraying should be commenced immediately. Comply with withholding periods for any insecticides sprayed on crops.

**Management Options**

- Assess how much of the cropping program and individual crops are at risk.
  - Canola after leaf drop – low risk.
  - Lupins at pod bronzing – low risk.
  - Pulses at pod yellowing – low risk.
  - Cereal completely dried off – low risk.
- Prior to spraying take into consideration the cost of applying insecticides with a ground rig versus application by a mister or aircraft.
- Consider how long it will take to spray using a boomsprayer versus application by a mister or aircraft.
- Limit swath width of misters to 50 metres.
- Consider crop desiccation in mid-October in an effort to make crops unattractive to swarming adults.

**Further information**

- Local DAFWA offices throughout the State; Pest and Disease Information Service (phone 1800 084 881 or email info@agric.wa.gov.au)

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