



# Farmnote

## Warehouse beetle (*Trogoderma variabile*)

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The warehouse beetle (*Trogoderma variabile*), relatively recently discovered in Western Australia, is a threat to grain and seed industries, public health and is notorious for attacking foodstuffs in stores and homes.

Control of the pest is compulsory.

### Significance

#### a) Agriculture

The warehouse beetle closely resembles the khapra beetle (*Trogoderma granarium*), widely regarded as the world's worst stored grain pest. In the 1950s Australia was mistakenly listed as a "khapra beetle country" owing to a misidentification. It took over 15 years for this stigma to disappear. Should countries importing grain from Western Australia confuse the warehouse beetle with the khapra beetle, the most serious consequences for export grain may result.

The warehouse beetle larva is the stage that does the damage, attacking a wide range of products. All sorts of cereal, vegetable and flour seeds, notably sunflower seed, paddy rice remnants, carrot and tomato seed, and fish food may be infested. The insect thrives on cereal products such as processed animal feeds or rolled barley and oats and recently proved to be especially fond of stored canola.

A characteristic of warehouse beetle infestations is the accumulation of cast larvae skins. Both [the larvae](#) and the [tissue-thin, brownish cast skins](#) bear spear shaped setae (hairs or bristles). These setae are known to cause gastric upset in babies and young children who are inadvertently fed contaminated food.

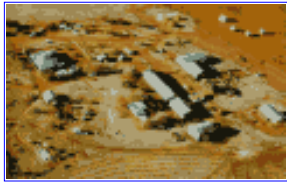
The insect is also highly allergenic and would be expected to pose additional problems for asthmatics and cause irritation or allergic reaction in sensitive persons.

Warehouse beetle can infest a great variety of grocery commodities and seeds. Packaging materials such as second-hand grain sacks and corrugated cardboard can also harbour the pest. The larva can chew through plastic wrappers, aluminium foil, airtight plastic containers and the like.

### Identification

[The larvae of the warehouse beetle](#) are five to eight mm long and covered with thick reddish-brown setae, which gives them a hairy appearance.

[The adult beetle is about three to five mm long, with three indistinct, whitish bands across the wing covers.](#) Dead insects may be greyer in colour. The adult



Farm fumigation is no longer required for warehouse beetle but will be used against Khapra beetle if it arrives



Figure 1. Larvae on canola



Figure 2. Cast larval skins





Figure 3. Warehouse beetle larvae

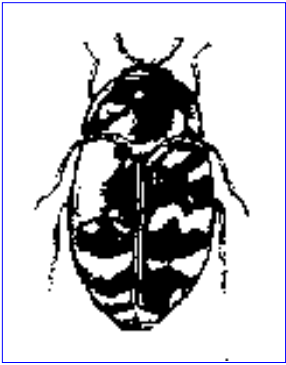


Figure 4. Warehouse beetle adult

does little damage and will not be as obvious as the larvae because of its short life span of 7 to 10 days.

Note: Larvae and adults of commonly occurring insects of the same family are similar in appearance to warehouse beetle, so specimens must be referred to a specialist for positive identification. Insects that might be confused with warehouse beetle include carpet and hide beetles or the harmless native *Trogoderma*.

### Inspection

Householders are urged to check for the larvae in undisturbed secluded areas, as the larvae are notorious for hiding in the darkest corners and crevices, especially in pantries and drawers. Because the larvae moult many times during development, which can take as long as four years, the large number of cast skins reveals infestations.

To find warehouse beetle larvae:

1. plan a systematic search that leads from one room to another in sequence;
2. look on windowsills, checking all dead beetles, moths, flies etc. as warehouse beetle may be found feeding on these. Lift up the edges of carpets to check for dead adults or live larvae;
3. larvae are frequently found under filing cabinets, cupboards, cardboard boxes, packages etc. These should be pulled aside and examined;
4. check the bottom of shelves, inside drawers, under stoves and refrigerators;
5. check rat and mouse baits or dead carcasses, mud dauber wasp and bird nests as well as spiders webs/egg masses;
6. check anywhere warm and dusty. Inspect all foodstuffs and seed in the pantry or food storage area;
7. forward suspect insects to Agriculture Western Australia.

Warehouse beetle can only be **eradicated** using total fumigation techniques, which can only be applied by licensed fumigators. Eradication is made difficult because of the secretive nature and the ability of the larvae to diapause (hibernate) for several years.

**Control** of the insect around the home can be achieved using a combination of good household hygiene and the timely application of recommended insecticides.

### Hygiene

Prior to the use of any insecticide or fumigant, a thorough clean up of the premises is essential to remove harbourage and host material. Thoroughly vacuum the infested area including all cracks, crevices, windowsills, drawers and cupboards. Dispose of debris and vacuum cleaner bag by burning. All infested foodstuffs and produce together with all corrugated cardboard boxes should be burned. Regularly check and dispose of rat baits.

### Insecticides

The timely application of both contact and residual insecticides will be necessary to achieve good control of warehouse beetle.

Select from the table below a *contact* insecticide to kill all active insects and then apply one of the suggested *residual* insecticides to give further protection.

Note that follow-up treatments will be required at six to eight week intervals.

### READ AND HEED THE LABELS!

Active ingredients	Trade name	Application rate	Comments
<i>Contact/surface insecticides</i>			
Permethrin	Imperator Smoke Generator®	1/250 m3 or 1/500m3	Contact with some residual effect
Permethrin	Various aerosols	Space spray	
Propoxur	Various aerosols	Space spray	
Pyrethrins	Various aerosols	Space spray	
Tetramethrin	Various aerosols	Space spray	
Cyfluthin	Various aerosols	Space spray	
Cypermethrin	Various aerosols	Space spray	
Dichlorvos (DDVP)	CIG Insectigas D®	Space/cavity treatment	May only be applied by licensed Pest Control Operator with informed consent of occupants.
<i>Residual insecticides</i>			
Azamethiphos	Alfacron 50®	10 g/L	Good residual up to 8 weeks
Permethrin	Coopex Residual Insecticide ®	20 g/L	Good residual up to 8 weeks
Permethrin	Coopex Industrial Strength Dusting Powder®	10 g/m2	Good residual up to 8 weeks
Deltamethrin	Cislin®	20 g/L	Good residual up to 8 weeks
Chloryriphos-methyl	Reldan®	20 mL/L	May have obnoxious odour and a short residual.

Residual insecticides should be applied to cracks, crevices, windowsills, under furniture and equipment, floors, walls and shelves.

Where major infestations are found in food stores and in stored grain facilities, complete fumigation and stringent hygiene are required.

### Further Information

- For further information contact Rob Emery, Agriculture Western Australia on (08) 9368 3247 or email: [remery@agric.wa.gov.au](mailto:remery@agric.wa.gov.au)
- Farmnote 13/87 ['Control of stored food insects'](#)
- Farmnote 5/99 ['Effective fumigation needs a properly sealed silo'](#)

- Farmnote 8/99 ['Grain storage: maintaining grain quality'](#)
  - Farmnote 9/99 ['Sealed silos make \\$ense'](#)
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