Aventis Environmental Science

Lesser Grain Borer

Description

Order: Coleoptera ("sheath wings")
Characteristics:

Forewings hard and leathery, meeting along mid-line of dorsal surface; hindwings membranous, sometimes lacking; biting mouthparts; well developed thorax; complete metamorphosis with egg, larval, pupal and adult stages.

Family: Bostrichidae
Antennae usually less than 11 segments with loose 3-segmented antennal club; prothorax more or less covering downward-turned head; hind coxae touching.

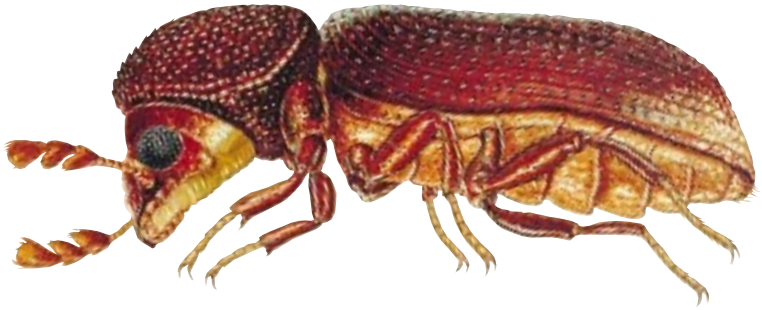
Species Characteristics:
Lesser Grain Borer ("Root destroyer from Dominica")
(*Rhyzopertha dominica*) Adult, 2.3 – 3.0 mm long: colour dark red-brown/black; cylindrical body with prothorax tuberculate, especially anteriorly; elytra with well defined rows of punctures; 5-segmented tarsi.

DISTRIBUTION

The Lesser grain borer originated in South America but is now a cosmopolitan pest especially in warm countries. It is a thermophilic pest which is particularly sucessful where temperatures are elevated; it is not cold hardy and there is only limited development at temperatures less than 23°C. It is associated with a wide variety of vegetable materials including wheat, barley, maize, rice, millet (dari seeds) sorghum, dried potatoes, dried herbs and biscuits. Infestations have also been recorded in wood and books. In Australia and India it is a serious pest of grains. Infestations are encountered in grain stores including ships holds, flour mills and animal feed mills.

SIGNIFICANCE

Lesser Grain Borers are primary pests of grain and will therefore attack undamaged grain rendering it susceptible to attack by secondary pests. Both the adults and larvae feed on the grain creating floury dust and potentially leaving little but empty husks. The adults are active and may infest a large number of kernels whilst the larvae penetrate kernels and develop within the grain.



Lesser grain borer
3.0mm long

Infestations in wheat can lead to reduced flour yields and will affect the quality of dough. Both volume and loaf characteristics can be adversely affected.

Commodities may be tainted by insect excreta and secretions. Heavily infested wheat is reputed to have an honey-like odour.

LIFE CYCLE

The female Lesser grain borer lays between 300 – 500 eggs over a period of *ca* three weeks. They are laid singly or in clusters from 2 – 30 and are often attached to the grain. Depending upon temperature the eggs hatch in 7 – 18 days to give white larvae with brown heads and relatively small legs. These bore into the grains where they feed and develop into fleshy forms with a typical C-shape. There are up to five moults leading to pupation in the grain. The pupal stage lasts about one week. The total life cycle lasts from 24 – 133 days depending upon temperature. At 26°C and 70% RH (14% MC in commodities) the life cycle lasts 45 days. Adults can live for 10 months.

CONTROL

Assessment of infestations
A variety of trapping techniques are available for measuring stored product beetle infestations. These include pit fall traps, bait bags, insect probe traps and adhesive traps. Whatever system is employed adequate records must be kept.

Hygiene/management
Stores should be soundly constructed to ensure maintenance of correct storage conditions and allow for easy cleaning. They should be insulated, well ventilated and damp-proof. Cracks and crevices, which may provide harbourages for the beetles, should be kept to a minimum.

Commodities should be stacked neatly above floor level using pallets, away from walls and should not touch the ceiling. A gap between stacks will allow for ventilation, regular inspection, cleaning and, if necessary, treatment with insecticides. Appropriate stock rotation is important and if possible there should be a one-way passage of commodities through the premises. The careful choice of packaging can help to deter insect attack. Generally, thick, tough materials with a smooth, shiny finish are preferred. Packs should be strong and well sealed.

It is important to ensure that there are no food residues in which beetles can breed and develop to infest new materials. Infested commodities should be destroyed or fumigated. Stores should be kept scrupulously clean and farm stores should be thoroughly cleaned before harvest.

All grain taken into store should be dried to a suitable moisture content and temperature e.g. <15%MC and <15°C and maintained in that condition.

Insecticidal control
Insecticides can be applied to the fabric of stores concentrating on potential insect harbourages. Alternatively it may be appropriate to employ grain protectants.

Glossary of terms

Prothorax: First thoracic segment.

Tarsus (Tarsi): Apical section of leg (the foot).

Advice

Aventis has an extensive range of products specifically formulated for the control of flying and crawling insect pests.

Further information on all Aventis Environmental Science professional pest control products is available from:

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