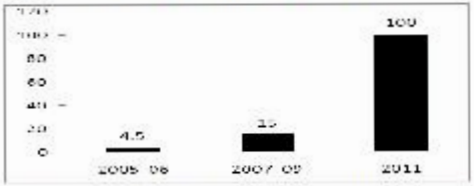
KHAPRA BEETLE

Trogoderma granaium Everts (Dermestidae: Coleoptera)

It causes 2-70% loss to the global economy and food grain loss attributed to this notorious pest in Pakistan is 10- 18%.

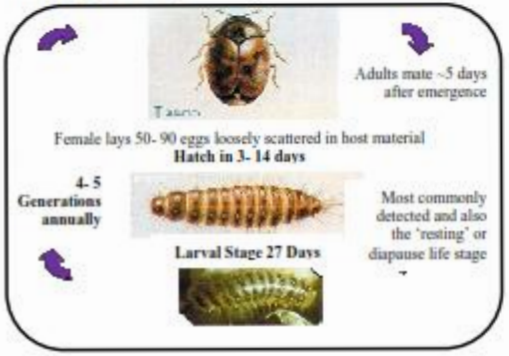
Larvae (grubs) cause damage to the rice grains near the embryo or any other weak point and from there proceed inwards. They usually confine themselves to the upper 50cm layer of grains in a heap or to the periphery. In case of severe infestation the grains damage in the form of frass.

Resistant to starvation is main feature of its widespread throughout the world. Its increasing and alarming interceptions from the international trade of rice are quite evident from the example of USA alone as under:



(Source:http://tucsoncitizen.com/view-from-ajaarizona/2011/07/26/us-being-invaded-by-khapra-beetle/)

Life Cycle completes in 37 days at 32°C



Following are the important recommendations which were developed after **Pupal Stage 2- 6 days** oint of all the stakeholders concerned with the rice export/ business. These instructions to control the notorious pest (khapra beetle) are as under:

Stockiest

- Maintain general cleanliness in the stores.
- Whitewash the stores regularly.
- Keep the stores free from cracks and crevices to check the shelter of Khapra beetle.
- Apply prophylactic treatment in and around the storage facility with any one pesticide (Deltamethrin 2.5EC, Fenvalerate 20EC and Lambda cyhalothrin 2.5EC @ 10ml/ litre of water) before storage.
- OR apply heat treatment in store along with empty bags at 60°C for 30 minutes before stocking.
- Ensure moisture level of rice during storage (12-14%).
- Ensure storage in batches and on the stacks.
- Carry out periodical inspection of the stores for the pest.
- Use polypropylene bags despite jute as the larvae prefer to live in rough surface as they are positively thigmotectic.
- Dry the old bags in sunlight.
- Store the rice in separate stores away from wheat.
- Ensure adequate space for free movement of labour.
- Don't mix the old stock with new one.
- Fumigate the rice storage to ensure Khapra beetle free environment with Aluminium phosphide in air tight environment.

Temperature	Tablets per		Airtight duration of store (Days)
	1000 ft³	*Ton*	
15- 25 °C	25- 28	1- 2	10
> 25 °C	25- 28	1- 2	07

Millers

- Maintain general cleanliness of the mill.
- Apply prophylactic treatment in and around the storage facility as mentioned earlier.
- Destroy rice remains of the last season to ensure the insect free new milled product.

Exporters

Storage

- Maintain general cleanliness in the stores.
- Ensure separate space for raw material.
- Walls & floors of the premises should be free from cracks & crevices and white washed.
- Observe regularly cleaning schedule of stores.
- Manage separate warehouse for packaging material.
- Apply prophylactic treatment in and around the storage as mentioned earlier.
- Use new bags or treat the old ones and sun dry them.
- Fumigate the rice storage to ensure Khapra beetle free environment as earlier mentioned.
- Record storage temperature and humidity regularly as airtight duration during fumigation fluctuate with change in temperature.

Packing

- Ensure separate packing facility.
- Whitewash the packing rooms regularly.
- Treat/ fumigate the packing material prior packing.
- Keep the packing room free from cracks and crevices to check the shelter of Khapra beetle.
- Apply prophylactic treatment in and around the packing room as per instructions as per captioned instructions.
- Packing should be done preferably during the day or in controlled conditions at night.

- Packing staff should be in their uniform/ apron to check the free movement of the notorious beetle in packing room.
- Use separate storage for finished/ packed products.
- Filled packs shouldn't be left unsealed.

Transportation

- Clean the transportation containers.
- Ensure container gaskets in proper form and position.
- Check container leakage.
- Ensure air tight conditions of the container before fumigation.
- Loading of the transportation containers at the processing facility despite at the port.

Other suggestions

- Strict checking of Khapra beetle at the ports.
- Use of expired fumigants should be checked.
- Bank controlled stock should be inspected regularly which are main source of infestation.
- Literacy in rice industry especially about phyto sanitary measures is of prime importance.
- Awareness raising about the export procedures.
- Setting of separate terminals for USA/ EU.
- Work load of exporters in processing units encourages non-compliance of phytosanitary measures. It should be managed properly.
- Formulation of SOPs/ ISO certification for rice export.

INTERNATIONAL CODES/ LAWS FOR INSECT FREE EXPORTS

1. Codex Standard For Rice

Part of the Codex standards related to phyto sanitation is as under:

3. ESSENTIAL COMPOSITION AND QUALITY FACTORS

3.1 Quality factors – general

3.1.1 Rice shall be safe and suitable for human consumption.

3.1.2 Rice shall be free from abnormal flavours, odours, living insects and mites.

(Source:http://www.codexalimentarius.net/download/standards/61/CXS_198e.pdf)

2. Sanitary & Phytosanitary (SPS) Agreement

The Sanitary and Phytosanitary Agreement (SPS) is the World Trade Organization's agreed rules on how countries can protect the health of their people, animals and plants, while facilitating trade.

The agreement clearly states that if a country's SPS measures meet the requirements of the SPS agreement, they fulfil that country's obligations under the WTO agreement.

SPS Risk assessment?

The evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuffs.

(Source:http://www.biosecurity.govt.nz/files/biosec/policy-laws/intl/sps/agreement/provisions.pdf)

POINT TO PONDER

U.S. Customs and Border Protection (CBP) enforced a federal quarantine order w.e.f July 30, 2011 that restricts the importation of rice into the U.S. from countries with known Khapra beetle infestations. For this purpose US. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) has restricted the importation of rice from countries known to have Khapra beetle.

The shipments of rice originating from these countries must be inspected, accompanied by a phytosanitary certificate with an additional declaration stating that the shipment was inspected and found free of Khapra beetle.

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KHAPRA BEETLE: CHALLENGE TO PHYTO-SANITATION

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