REDUCING PESTICIDE EXPOSURE

Care must always be taken to prevent accidental exposure to pesticides even though all registered products are considered safe to use if handled properly.

Properly labeled residual insecticide shall be applied, according to all label directions for each infested site. Pay special attention to cracks, crevices, and edges. When planning and conducting any treatment, consider the opposite side of any involved wall, floor or ceiling. On-board ship CB D-Force® HPX ®Residual Insecticide (NSN: 6840-01-561-9745), PT 565 (NSN: 6840-00-823-7849) and Gentrol (NSN: 6840-01-318-7416) can be used. **Insecticides with repellent properties should not be used in conjunction with baits as they can cause populations to spread to other areas. Document applied pesticide on DD Form 1532-1 and e-mail to proper channels.**

If the ship is treated with pesticides by a DoD certified pesticide applicator, it is recommended that you:

- Vacate immediate area during treatment.
- Follow all pesticide label instructions for use and re-entry time.
- Arrange to be out for 4 to 8 hours after the application (24 hours if you have respiratory ailments, allergies or are sensitive to chemicals).
- Air out the site, if feasible, when you return.
- Avoid washing decks and treated surfaces.

SELF-CARE AND TREATMENT

Stored-product pests do not transmit blood-borne disease. For some people they may cause intestinal issues upon ingestion, or in some cases the pests may cause serious airway related injuries.

- High standards of hygiene and sanitation need to be maintained at all times to deny stored product pests from entering your premises & should be the first line of defense
- If you become ill; it is important to seek medical attention immediately and if possible try to identify the pest that may have caused your affliction.

ADDITIONAL INFORMATION

Navy and Marine Corps Public Health Center
620 John Paul Jones Circle, Suite 1100
Portsmouth, VA 23708
(757) 953-0700/DSN 377-0700
www.med.navy.mil/sites/nmcphc/Pages/Home.aspx

Navy Environmental Preventive Medicine Unit 2
1285 West D Street, Norfolk, VA 23511
(757) 953-6600/DSN 377-6600
https://www.med.navy.mil/sites/nepmu2/NEPMU2-Redesign-2018/SitePages/pest.aspx

Navy Environmental Preventive Medicine Unit 5
3235 Albacore Alley, San Diego, CA 92136
(619) 556-7070/DSN 526-7070
https://www.med.navy.mil/sites/nepmu5/Pages/EntoDiv.aspx

Navy Environmental Preventive Medicine Unit 6
385 South Avenue, Building 618, JBPHH, HI 96860
(808) 471-0237/DSN 471-0237
https://www.med.navy.mil/sites/nmcphc/nepmu-6/Pages/operational-support.aspx#entomology

Navy Environmental Preventive Medicine Unit 7
PSC 819 Box 67, FPO AE 09645-0025
011-34-956-82-2230/DSN (314) 727-2230
https://www.med.navy.mil/sites/nmcphc/nepmu-7/Pages/Education-and-Training.aspx

Navy Entomology Center of Excellence
Bldg. 953, NAS Jacksonville, 32212
(904) 542-2424/ DSN 942-2424
www.med.navy.mil/sites/nmcphc/nece/administration/Pages/default.aspx#contactus

Armed Forces Pest Management Board
www.acq.osd.mil/eie/afpmb/

Note: If assistance is needed for the control of any pests, contact your nearest Navy Environmental and Preventive Medicine Unit or the Navy Entomology Center of Excellence.

SHIPBOARD GUIDE TO STORED PRODUCT PESTS

Fig.1. Khapra Beetle

Information on the control of Stored product pests (SPP) on ships using integrated pest management.

Navy Environmental and Preventive Medicine Unit TWO
1285 West D Street
Norfolk, VA 23511
Comm: (757) 953-6600
DSN: 377-6600

PURPOSE

Stored-product insects may cause significant damage and loss to stored foods, fibers such as those used to produce uniforms, tents, blankets, and animal products such as leather. DoD personnel can minimize losses if infestations are quickly identified and the appropriate management measures are implemented. This pamphlet will provide the ship's crew and medical department with information on:

1) Identification of stored-product pests;
2) Stored-product pest behavior;
3) Surveillance and signs of infestation;
4) Management of stored-product pests within ships and pesticide safety and applicable regulations;
5) Reducing pesticide exposure;
6) Self care and treatment; and
7) Whom to contact for further information.

IDENTIFICATION

Over 100 species of insects, mostly beetles and moths, can infest food products brought aboard ship. Only a few species are responsible for the majority of damage to stored commodities. The important species of SPP insects include: Dermestid beetles, Tribolium beetles, Saw-toothed grain beetles and Rice Weevil.

- Dermestid beetles can be recognized by the distinct zig-zag pattern on their wing covers. The dermestid larvae will appear larger than the adults and covered in reddish brown or black setae (hairs).
    a. Khapra beetles (Fig.1): is one of many species of dermestid beetle and can be identified by its brown color with pronounced yellowish hairs. Internationally quarantined insect.
- Tribolium beetles include the Red Flour Beetle and the Confused Flour Beetle. These two are similar in appearance apart from their antennal segments. The red flour beetle has 3 distinctly larger segments than the confused flour beetles antennae that gradually become larger towards the end. The larvae differ from the adult in that they are a creamy yellow to light brown color with no visible setae or hairs.
- Saw-toothed grain beetle adults can be identified by its six saw-toothed projections on each side of the thorax. This beetle is the most common SPP aboard ship.
- Rice Weevil adults can be identified by their elongated snout and the presence of two yellowish or reddish dots on the top of each front wing cover.

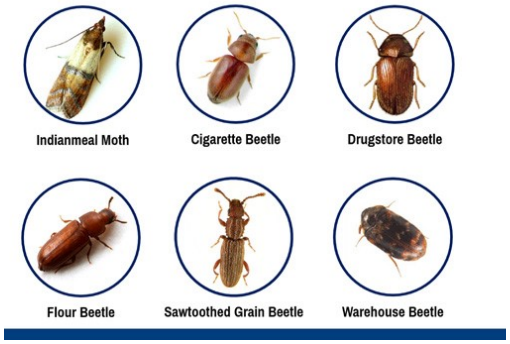

Fig.2. common stored product pests

STORED-PRODUCT PEST BEHAVIOR

Stored products pests include more than 100 different species of insects, most of which are moths and beetles. They infest a wide variety of supplies including cereals, flour, farina, grits, candy, pet food, and any other non-canned food plus various animal fiber items, e.g., blankets, uniforms, and boots.

- Stored product pests are mainly found in dry-storage areas infesting cereals, grains and other non-canned foods.
- Some signs that shows presence of a stored-product pest include: Frass, (fine powdery refuse or fragile wood produced by insects), holes in packaging, silk, or damaged goods and discoloration.
- Ingestion of part or whole insects may cause serious intestinal problems.

SURVEILLANCE

- Visual inspections for stored-product pests are usually the most effective.
- The most effective way to prevent an infestation is always proper surveillance, sanitation and regular inspections of stored products.
- Be sure to inspect stores regularly checking seams and containers for openings that would allow a pest to enter and infest the products.
- When an infestation is found generally the product infested is destroyed when it contains: up to 7 insects per pound of all other insects, 1-3 insects per pound of tribolium beetles, and 1 part or whole insect of dermestid beetles condemns the whole lot.

MANAGEMENT OF STORED-PRODUCT PESTS

Stored-product pests are difficult to deal with once an infestation is present. Proper inspection of stores and sanitation of storage areas is a main eliminator of potential infestations. General inspections should be occurring upon receipt of goods and once every two weeks for general surveillance and once a week during an active infestation.

Non-chemical control/inspection includes:

- Inspecting and ensuring properly sealed stored products is a good way of preventing an infestation.
- All broken containers, torn sacks, and spilled foodstuffs should be removed promptly; decks should be swept and vacuumed before receipt of new stores.
- Infested items must be isolated or promptly disposed of to prevent contamination of other materials.
- Once a product is infested but still consumable, freezing it for 2 weeks will kill all life stages of the insects except the eggs. All dead insects must be removed prior to consumption.
- Spilled food is an open invitation to insects and rodents, it is the responsibility of inspectors to document every sanitation problem and for management to correct the deficiency.

Chemical control :

1) Pesticide applications must be conducted by a **DoD certified pesticide applicator** (IDC/PMT/Entomologist).
2) Be prepared for more than one treatment.
3) Re-inspection after treatment is **absolutely essential**. Re-inspection should be conducted every 30 days.

Fig.3. weevil infestation of grains.