

The Centers for Disease Control and Prevention's Vessel Sanitation Program is proud to bring to you the following session:

Integrated Pest Management

While this presentation is primarily intended for cruise vessels under the jurisdiction of the Vessel Sanitation Program it may also be used by anyone who is interested in this topic.

This session should not be used as a replacement for existing interactive training but should be used as an adjunct to a comprehensive training program.



SAFER • HEALTHIER • PEOPLE™



Integrated Pest Management (IPM)

Vessel Sanitation Program
2007



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Learning Objectives

- List the components of a good IPM plan
- List some of the conditions that are favorable for pest infestations
- List acceptable forms of training staff in IPM
- List the types of inspections to be conducted for pests and the acceptable inspection times
- List the considerations for passenger and crew health and safety when using pesticides



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Integrated Pest Management (IPM) Plan

- Team approach
 - Members
- Entire Vessel
- Easy to Understand



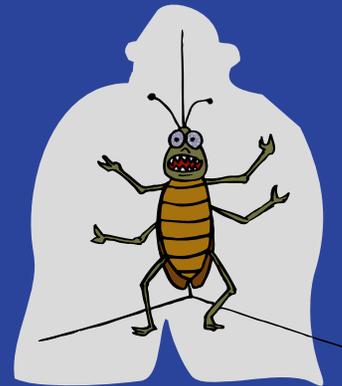
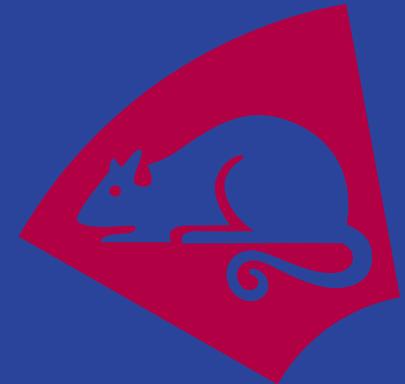
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IPM Plan

- Monitoring
- Logs
- Passive Surveillance
- Training
- Pesticide List



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Monitoring

- Scheduling
- Training
- Documentation
- Equipment



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Monitoring Shipments

- Shipments
 - Food items
 - Non-food items



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Logs and Record Keeping



- Document
 - Vermin
 - Live or Dead
 - Location
 - Numbers
 - Stage of development
 - Action
 - Pesticides used
 - Follow-up

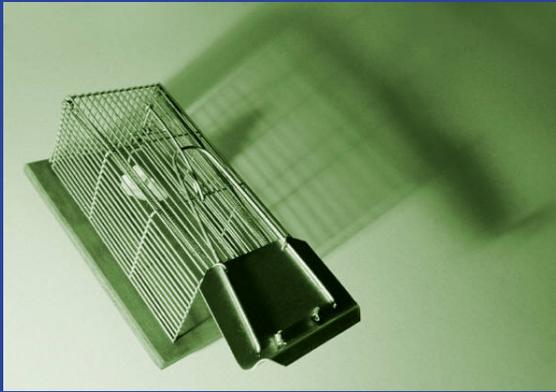


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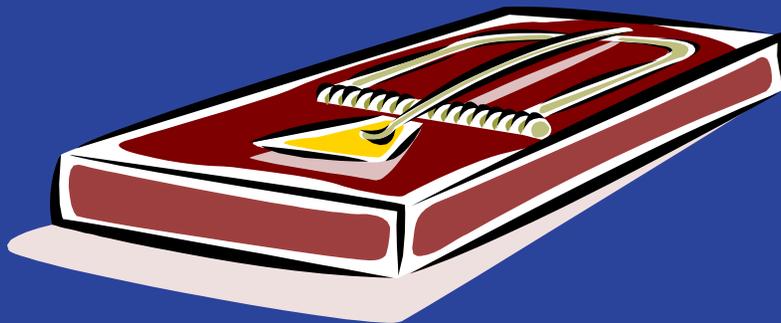
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Passive Surveillance



- Devices
 - Glue traps
 - Rodent traps
 - Others
- Location
 - Map
 - List



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Training



- In House
 - On the job
- Contractor
 - Licensed
- Documentation



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Pesticides and Effectiveness

- Record of Pesticides
 - On vessel
 - Used within past 12 months
- Effectiveness



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Health and Safety Procedures

- Protect passengers and crew
 - MSDS's
 - Protective equipment
 - First aid
 - Storage
 - Compatibility
 - Organized
 - Application
 - When and How



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Insect Traps

- Location
 - Electrocutation
 - Glue
- Cleaning
- Replacement



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Plan Evaluation

- Components
 - Frequently
- Entire Plan
 - Every 2 years



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IPM-The Basics

- Build them out
- Eliminate Food and Water
- Prevent Harborage
- Conduct Inspections
- Pesticide Application



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Build Them Out



- Construction
- Remodel
- Protect openings



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Prevent Harborage

- Store items off deck
- Store items away from bulkheads
- Discard/Remove unused items
- Seal cracks and crevices
- Limit excess storage (spare parts)



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Eliminate Food and Water

- Food storage
- Cleaning schedules
- Pooled water
- Deck drains
- Refuse containers
- Unpacking cartons
- Dead insects



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Conduct Inspections



- Frequency
 - Open areas
 - Technical spaces
 - Non-food areas
- Harborage conditions
- Cleanliness of facilities
- Take action
- Document



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Pesticide Application and Use



- Insecticides
 - Cockroaches
 - Flies
 - Grain pests
- Rodenticides
 - Pellets
 - Blocks
- _____icides
 - Pest specific



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Pesticides Use and Application

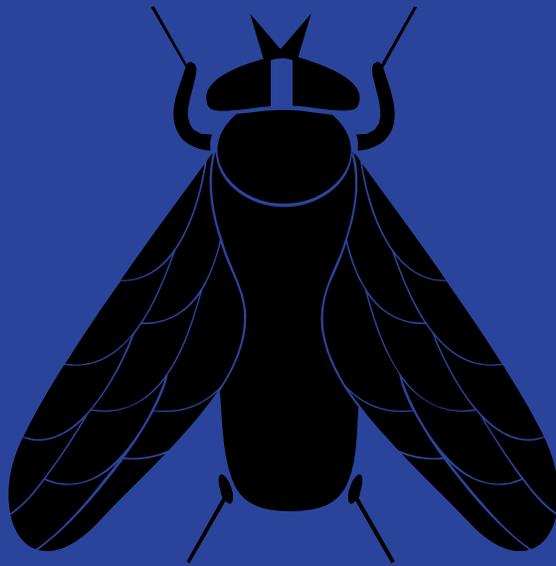
- Toxicity and Residual
- Training of applicator
 - Non-restricted use
 - Restricted use
 - Certified applicator
- Areas used
 - Food vs. non-food areas
- **READ THE LABEL**



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Knowledge of Life Cycles and Behavior



- Appearance
 - Species
 - Stage of development
- Reproduction
 - Frequency
 - Age when adult
- Behavior
 - Likes and dislikes
 - Neighborhood



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Egg to Adult
45 days



40 eggs in
egg case
 $\frac{1}{2}$ male $\frac{1}{2}$ female



Day 1 -	egg	
Day 45 -	1 Adult female	40 eggs
Day 90 -	21 Adults	840 ⁺ eggs
Day 135 -	441 Adults	17,640 eggs
Day 180 -	9261 Adults	370,440 eggs
Day 225 -	194,481 Adults	7,779,240 eggs
Day 270 -	4,084,101	163,364,040 eggs

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Resources and References

- www.cdc.gov
 - www.cdc.gov/nceh/vsp
- www.epa.gov
- www.usda.gov
- www.fda.gov



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