


Learning Objectives IPM

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1. Integrated Pest Management (IPM) in risk reduction terms
2. Benefits of IPM in sensitive environments
3. Health, environmental and economic risks associated with pests and pesticides
4. Key elements of IPM

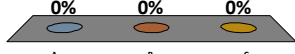


### 1) Integrated Pest Management is:

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- A. A science-based, environmentally sound approach to pest management
- B. An approach that relies on the use of multiple pesticides exclusively
- C. An approach that relies on the use of multiple non chemical tools exclusively

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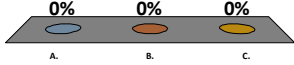


### 2) An Integrated Pest Management approach includes:

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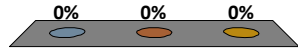
- A. Scheduled pesticide applications
- B. Scheduled organic pest control products
- C. Coordination, monitoring, ID, sanitation, pest-proofing, pesticides, education and communication

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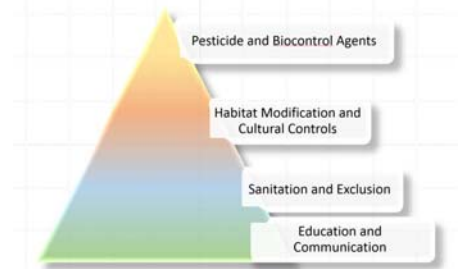
### 3) Inspection for pest conducive conditions involves looking for:

- A. Food sources, water/moisture, pest habitat and harborage
- B. Pests, frass/scat, tubes, nests, openings, egg cases, silk, and damage
- C. Pests, little else can be relied upon as valuable information



### How IPM Reduces Risks From Pests and Pesticides

- IPM is a science-based, environmentally sound approach to pest management



### How IPM Reduces Risks From Pests and Pesticides

- Integrated Pest Management (IPM) is a process that minimizes risks from:
  - Pests by reducing resources - food, water and shelter
  - Pesticides by reducing the need
- IPM is a team effort!



### How IPM Reduces Risks From Pests and Pesticides

#### The need for IPM in sensitive environments:

1. Children's sensitivity to pests and pesticides
2. Elderly sensitivities
3. Medically compromised vulnerabilities
4. Chemically sensitive people



How IPM Reduces Risks From Pests and Pesticides

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- Pest management problems include:
  - Excessive and hazardous pesticide use
  - Unchecked pest problems



How IPM Reduces Risks From Pests and Pesticides

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- An independent evaluation of 29 school systems in more than 14 states revealed that **almost half** violated legal requirements or district policies for pest control (Green *et al.*, 2007)



How IPM Reduces Risks From Pests and Pesticides

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- What are some pest related asthma triggers?

Exposure to:

- Pests
- Rodents
- Cockroaches
- Dust mites
- Mold and mildew



How IPM Reduces Risks From Pests and Pesticides

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- Asthma affects nearly **9.5%** of school children nationally (CDC, 2011)



### How IPM Reduces Risks From Pests and Pesticides

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- ❑ US EPA and the Centers for Disease Control recommend IPM to reduce asthma problems
- ❑ **Asthma is the number one reason students miss school (and caregivers miss work)**



### How IPM Reduces Risks From Pests and Pesticides

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- ❑ IPM vs. conventional pesticide applications:
  - **Pest populations are managed to acceptable levels**
  - **Reduced pesticide dependence**
  - **Lower allergen levels**
  - **Cost effective management**
- ❑ Preventative, practical action!



### Benefits of IPM

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- ❑ Protects human and environmental health
- ❑ Preserves non-target organisms
- ❑ Improves indoor air quality



### Benefits of IPM

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- ❑ Healthier, more comfortable environment
- ❑ Gives long-term Management of pests
- ❑ Sustainable



Risks Associated with Pests and Pesticides

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- Health
- Environmental
- Economic risks




Risks Associated with Pests and Pesticides

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- Exposure to some pest allergens can trigger asthma
- Pests can contaminate food causing food poisoning and upset stomachs
- Physical harm
  - Example: rat bites



Risks Associated with Pests and Pesticides

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- Ticks can cause of Lyme disease
- Mosquito vectors can cause flu-like symptoms or more severe symptoms such as brain inflammation
  - Example: West Nile Virus



Risks Associated with Pests and Pesticides

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- Stinging and venomous bites
  - Example: scorpions and spiders
- Between **0.5 - 4%** of the US population are prone to developing an allergy and hypersensitivity to bee, wasp, hornet or ant stings



Risks Associated with Pests and Pesticides

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- ❑ Pests cause building and grounds damage
- ❑ Costs add up if the cause of the problem goes unfixed



Risks Associated with Pests and Pesticides

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Pesticide exposure may cause harmful effects


- ❑ **Acute** effects: occur from single exposure and develop within 24 hours
- ❑ **Chronic** effects: occur after many low-dose exposures over time
- ❑ **Delayed** effects: occur after 24 hours, sometimes as a result of multiple exposures

Risks Associated with Pests and Pesticides

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Acute Effects

- ❑ Headache
- ❑ Fatigue
- ❑ Nausea
- ❑ Diarrhea
- ❑ Convulsions
- ❑ Inability to breathe
- ❑ Unconsciousness




Risks Associated with Pests and Pesticides

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Chronic Effects

- ❑ Birth defects
- ❑ Tumors, cancer
- ❑ Genetic changes
- ❑ Blood disorders
- ❑ Nerve disorders
- ❑ Reproductive effects
- ❑ Developmental disorders




Risks Associated with Pests and Pesticides

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Delayed Effects

- Memory loss
- Tumors
- Cancer

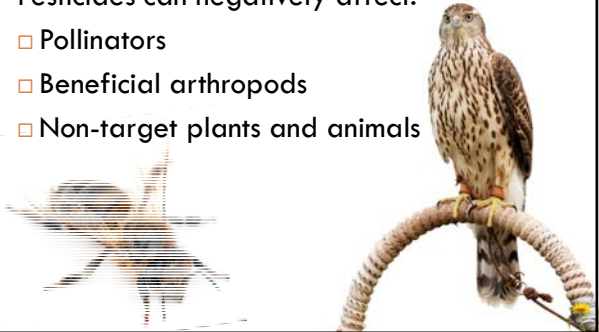


Risks Associated with Pests and Pesticides

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Pesticides can negatively affect:

- Pollinators
- Beneficial arthropods
- Non-target plants and animals




Risks Associated with Pests and Pesticides

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Children Are Particularly Vulnerable

Children:


- Process toxicants differently
- Have critical developmental stages
- Have rapid metabolic rates
- Are exposed to pesticides due to behavior



Risks Associated with Pests and Pesticides

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- Potential exposure to pesticides in food and water
- In relation to body weight, infants and children eat and drink more than adults



Risks Associated with Pests and Pesticides

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The National Academy of Sciences 1993  
Landmark Report estimates that




**50%**  
of lifetime pesticide  
exposure occurs in the  
**first five years** of life

Risks Associated with Pests and Pesticides

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- Pesticides can persist for years
- Pesticide resistance



Risks Associated with Pests and Pesticides

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- Pesticide use can increase costs
- Unsafe pesticide exposure can result in costly litigation



Risks Associated with Pests and Pesticides

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Are some pesticides safer than others?

- The EPA **Conventional Reduced Risk Pesticide Program**
- Goal is to quickly register commercially viable alternatives to riskier conventional pesticides






Risks Associated with Pests and Pesticides

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□ **Advantages of reduced risk pesticides:**

- Low impact on human health
- Lower toxicity to non-target organisms (birds, fish, plants)
- Low potential for groundwater contamination
- Low use rates
- Low pest resistance potential
- Compatibility with IPM practices

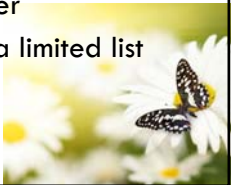


Risks Associated with Pests and Pesticides

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□ **Minimum-risk pesticides:**

- Exempt from EPA registration under Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
- No EPA registration number
- Contain ingredients from a limited list recognized as safe
  - E.g., cedar oil, cinnamon oil, citric acid




Risks Associated with Pests and Pesticides

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□ **Biopesticides:**

- Derived from natural materials from animals, plants, bacteria and certain minerals
- Registered with EPA

□ E.g., insect sex attractants (pheromones), baking soda, canola oil and other natural products



Risks Associated with Pests and Pesticides

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When using pesticides, some States require:

- Physical posting of treated areas
- Notification
- Licensing
- Other restrictions



Risks Associated with Pests and Pesticides  
School District and Child Care Posting and Notification - Arizona

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- ARS 32-2307 requires a licensed pesticide applicator should notify schools or child care facilities at least 72 hours prior to any pesticide application
- Only licensed pesticide applicators are allowed to apply pesticides in schools, child care, food service and medical facilities**



Risks Associated with Pests and Pesticides  
School District and Child Care Posting and Notification - Arizona

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- ARS 32-2307 requires that pesticide treated areas are posted immediately after the application for 48 hours after
- ARS 15-152 requires that school pupils, employees, parents and guardians, have at least 48 hours' notice before pesticides are applied
- Sensible exemptions are built into the statute**



People fail

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Risks Associated with Pests and Pesticides

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- The purpose is to reduce risks associated with pesticide use around vulnerable populations while allowing the use of effective pesticides for pest control when needed



Key Elements of IPM 


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- ❑ Coordination, planning and policy
- ❑ Inspection, identification and monitoring
- ❑ Determination of cause of the infestation
- ❑ Improved sanitation
- ❑ Pest-proofing
- ❑ Judicious use of pesticides/biopesticides
- ❑ Education, communication, evaluation

Key Elements of IPM

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- ❑ The IPM Coordinator or Pest Management Point Person is the primary contact for all pest management matters
- ❑ PMPs




Key Elements of IPM

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Pest management contracts should include:

- ❑ Services in line with institutional policy
- ❑ Regular consultation with the IPM Coordinator
- ❑ Procedures for responses to pest sightings
- ❑ Schedules for regular inspections
- ❑ Requirements for record keeping




Key Elements of IPM

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PMPs should:

- ❑ Provide labels and **SDS** documents
- ❑ Give specific **recommendations** to correct **pest-conducive conditions**
- ❑ Facilitate proper **posting and notification**



## Key Elements of IPM

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- PMPs provide leadership
- An IPM Plan keeps you organized
- IPM Policy provides direction
- **IPM training provides guidance**
- Regular IPM communications keeps everyone aware



## Key Elements of IPM

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## PMPs should:

- Correctly diagnosis the cause of pest problems
- Educate building inhabitants
- Promote least-hazardous methods



## Key Elements of IPM

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**Inspection** involves the regular observation and recording of pest resources (food, water, shelter):

- The **physical condition** of buildings and grounds
- Assessment of pest conducive conditions including **sanitation** and **exclusion**
- Detection of **pest damage** and **pest signs**

## Key Elements of IPM

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## Physical evidence of pest presence:


- Rodent droppings and grease marks
- Pests caught in sticky monitoring traps
- Flies caught in UV light traps
- Ant, bee and bird nests



Key Elements of IPM


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- Monitor and repair leaks
- Repair leaky valve boxes
- Keep flooring, machinery surfaces dry
- Ensure rainwater drains away from buildings
- Ensure air-conditioning condensate does not pool in drop ceiling tiles or attic areas



Key Elements of IPM

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Under optimum conditions some mosquito species can develop from eggs to adults in as little as four days

Key Elements of IPM

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Focus on prevention:


- Improving sanitation reduces access to food
  - Example: dirty floor drains



Key Elements of IPM

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- Rapid clean-up food spills
- Restrict food and drinks to certain areas
- Seal stored food in pest-proof containers
- Maintain clean, debris free dumpsters
- Deep clean Pest Vulnerable Areas:
  - Kitchens
  - Cafeterias
  - Food storage rooms




Key Elements of IPM

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Effective door sweeps and seals can reduce pest entry up to 65%

Pest Entry Points




Key Elements of IPM

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Maintenance:


- Prevent pest access by “pest proofing”



Key Elements of IPM

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- Ensure door sweeps and weather stripping provide a tight seal around entryways
- Seal cracks, crevices and holes around exterior wall penetrations



Key Elements of IPM

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- Prune plants to maintain three feet clearance from buildings
- Create a 12-inch vegetation-free perimeter around building foundations



Key Elements of IPM

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- Mold can cause health problems
- Too much exposure to mold may cause or worsen conditions such as asthma, hay fever or other allergies




Key Elements of IPM

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Problematic



Excellent




Cockroaches live in and feed on cardboard boxes

Key Elements of IPM

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**Pest identification and location:**

- Determines how the pest will be managed
- Whether or not an organism is a “pest”
  - Example: termites



Key Elements of IPM


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**Why monitor and ID?**

- To detect problems early, especially in pest vulnerable areas (PVA's)

**Action thresholds:**

- When the number of pests hits your action threshold its time to act
  - Example: cockroach




Key Elements of IPM

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**What is monitoring?**

- Monitoring is ongoing, systematic pest data collection
- Focuses on pest vulnerable areas



Key Elements of IPM

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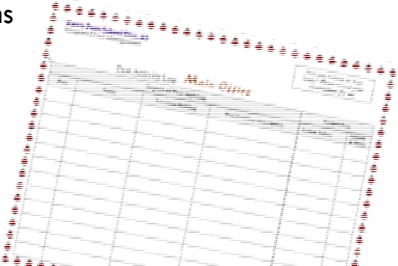


**Insect monitors** work 24-7 to: identify type, number and direction of travel of pests

Key Elements of IPM

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- A pest sighting logs can help building inhabitants report and respond to pest problems




Key Elements of IPM

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Recordkeeping is important it allows:

- Accurate flow of information
- Identification of trends in pest populations






Key Elements of IPM

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Recordkeeping includes


- Inspection and monitoring results
- Pest complaints
- Pesticide applications
- Evaluation of methods



Key Elements of IPM

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- Ants
- Cockroaches
- Flies
- Mice and rats
- Spiders
- Termites
- Bees/wasps
- Bed bugs
- Head lice



Key Elements of IPM

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- Pigeons and sparrows
- Small mammals
- Snakes
- Turf, ornamental and tree insects
- Disease vectors
- Stinging/venomous
- Nuisance pests
- Weeds
- Plant diseases





Key Elements of IPM

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Form partnerships with:

- University extension
- Department of health
- Your pest management professional
- Non-governmental organizations working to improve environmental health and safety



## The IPM Approach


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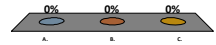
- Prevention - focuses on preventative strategies that reduce the chances of pest infestation in the first place
- Remediation – resolves the reason why pests are there if present
- Control - manages infestations below critical levels in the safest most effective and sustainable manner possible



## 1) Integrated Pest Management is:

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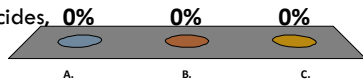
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## 2) An Integrated Pest Management approach includes:


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## 3) Inspection for pest conducive conditions involves looking for:

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