



ACE Preparation Course:

SELECTION AND IMPLEMENTATION OF CONTROL METHODS

PRINCIPLES OF IPM





What is IPM?

An environmentally sound approach to pest control

Quality pest control using the least hazardous chemicals and techniques

“best management practice” for pests

Why IPM?

Reduces human health risks

Provides long-term value

Reduces customer complaints
and callbacks

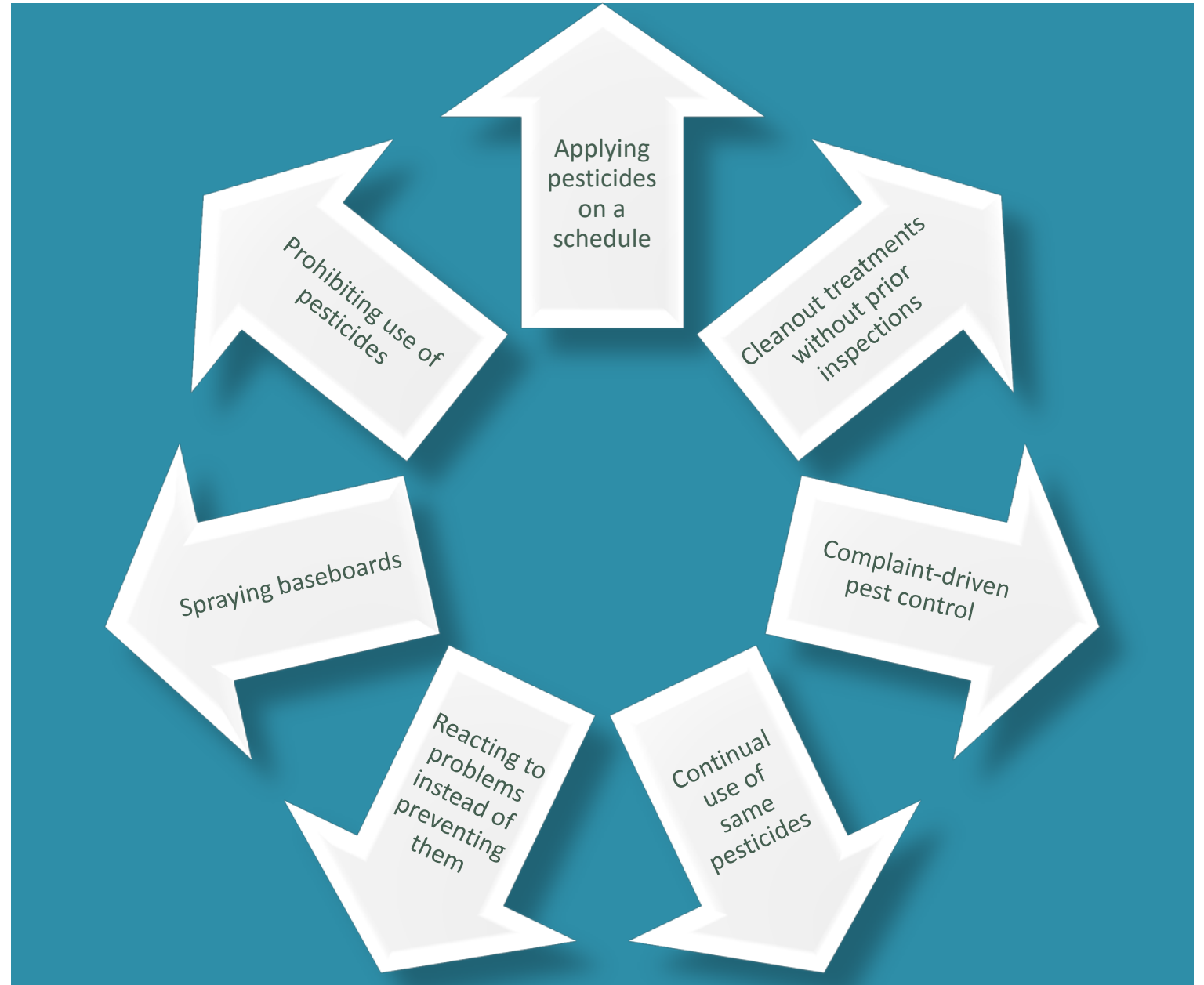
Provides better pest control

Integrated pest management is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people and the environment.

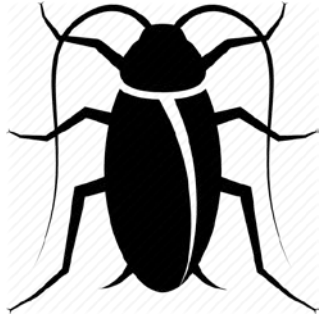
U.S. Environmental Protection Agency



What IPM is
not...



Essential ingredients of IPM



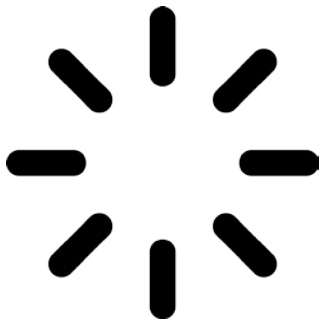
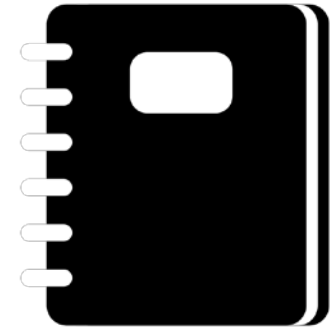
Regular
inspection

Pest
identification



Thresholds

Good
recordkeeping



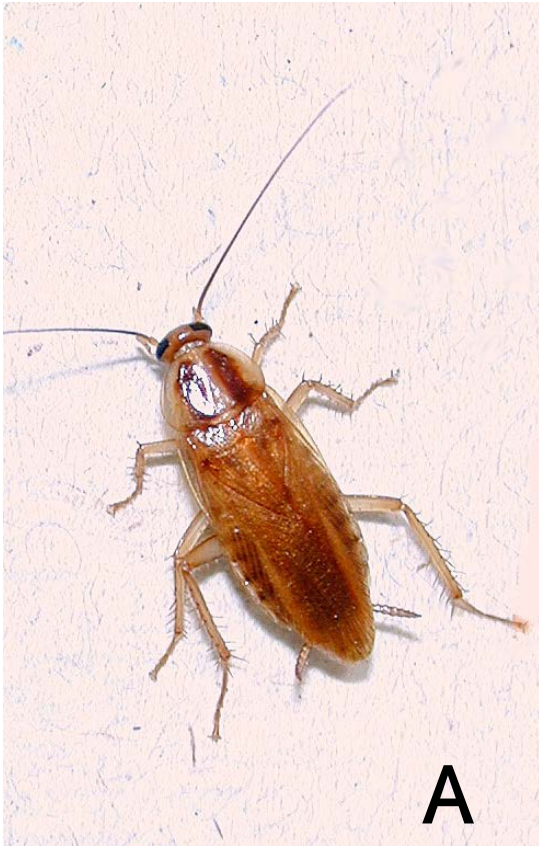
Using multiple
control tactics

Gaining
cooperation of
client



Why is an exact ID important?

Which of these two species....



- Requires a larger cockroach bait station?
- More likely to be far from water?
- Likely to be found outdoors or in sewers?
- More likely to be found in a utility room?
- More likely to be found in a restaurant booth?





To an entomologist
there is no such
thing as just a
“cockroach”

or an “ant” or a “fly”

Before you can do IPM you must know the...



The pest triangle

Every pest requires food, moisture, and the right environmental conditions/harborage to thrive

When all these things can be found within the range of travel for a pest, conditions are *conducive* for infestation

Food source

Water/moisture



Habitat/harborage

Inspections: The backbone of IPM



Why inspect?

What to inspect for?

- Pests
- Pest signs
- Conducive conditions

Essential tools for the pesticide applicator

Flashlight

Magnifiers

Visual/auditory inspection aides

- Mirrors
- Borescopes
- cameras, etc.

Monitoring traps

Spatulas, probes

moisture meter

personal protective equipment

clean-up supplies

specimen containers



Stereomicroscope

Essential for accurate identification of small insects and mites

Common magnifications in range of 6X to 40X

Smaller, portable 30X scopes may be acceptable for field ID of small insects

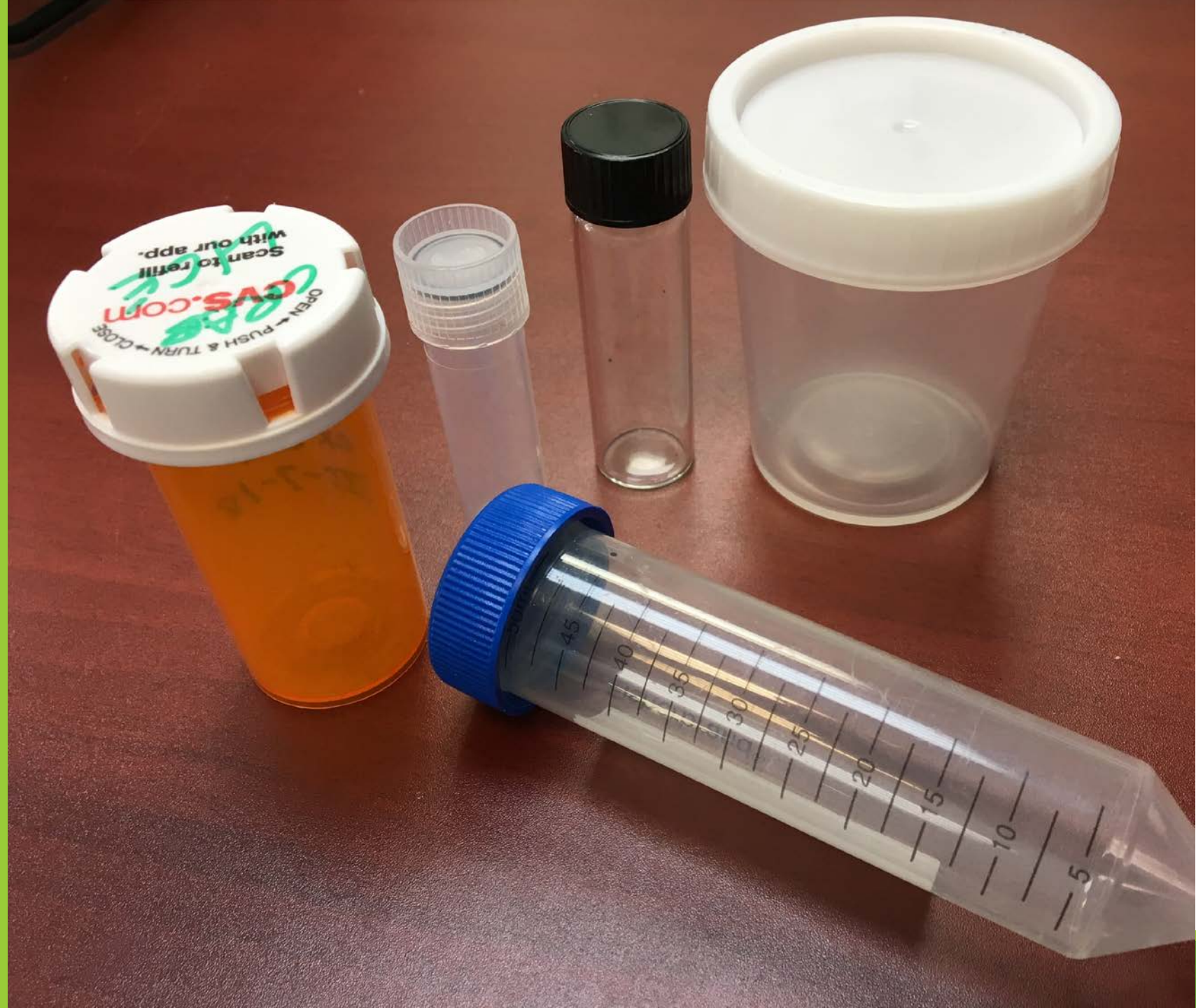


Collecting vials

Waterproof containers essential for capturing and transporting insect samples

May be used with ethanol or rubbing alcohol for preserving insects

Never place insects with cotton



Definitions

SAMPLE/INSPECTION

A sample is a one-time observation of pest signs, presence. It is usually recorded in a pest control report.

MONITORING

Monitoring occurs when inspections are made and recorded *over time*. Monitoring allows for trend analysis and program evaluation.



Image courtesy A-Best Termite and Pest, Akron OH

Pest control service report

NO JOB'S COMPLETE UNTIL THE PAPERWORK IS DONE

Your Company Integrated Pest Management means safer, better pest control

IPM Service Report Form

Report No. _____

Type of Service visit <input type="checkbox"/> Routine Service / Inspection <input type="checkbox"/> Follow-up for previous problem <input type="checkbox"/> Response to complaint Contact person: _____	Business _____	Date: _____
	Service Address _____	Time In: _____
	Problems area(s) if reported _____	Time Out: _____

Areas Inspected (Check all that apply)

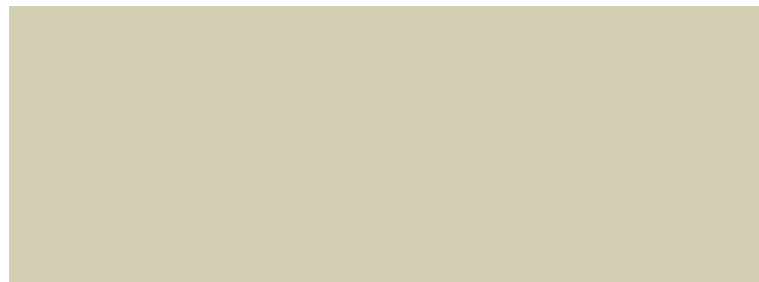
Indoors
 Site Abbreviations: MK-Main Kitchen, DIN-Dining Area, CL-Classroom, BR-Breakroom, ADM-Administrative offices, LK-Locker rooms

Site	Pest (be specific)	Activity Level	Non-chemical Action	Materials Used (see Key below)	Amount Used (lb, oz, gal, ml, g)	Method/ Equipment *

* Application methods: C&C - crack and crevice, SPOT - spot treatment (less than 2 sq ft), BC - Broadcast, Fog - fog, BS - bait station, VT - void treatment, BT - burrow treatment

Key to Materials / Chemicals Used					
Abbreviation/ Number	EPA Registration No.	Trade Name e.g., Dragnet®	Common name(s) e.g., permethrin	Formulation*	Hazard Classification: (Danger, Warning, Caution/ Texas: Green, Yellow, Red)

* Formulation abbreviations: S - liquid spray from compressed air sprayer, ACC - Aerosol crack and crevice, GB - gel bait, GrB - granular bait, SB - station bait, BB - weatherproof bait block, BP - weatherproof bait pellet, GR - granular pesticide, ULV - Ultra-low volume space spray, F - fumigant, D - dust, O - other



Interpreting monitoring results

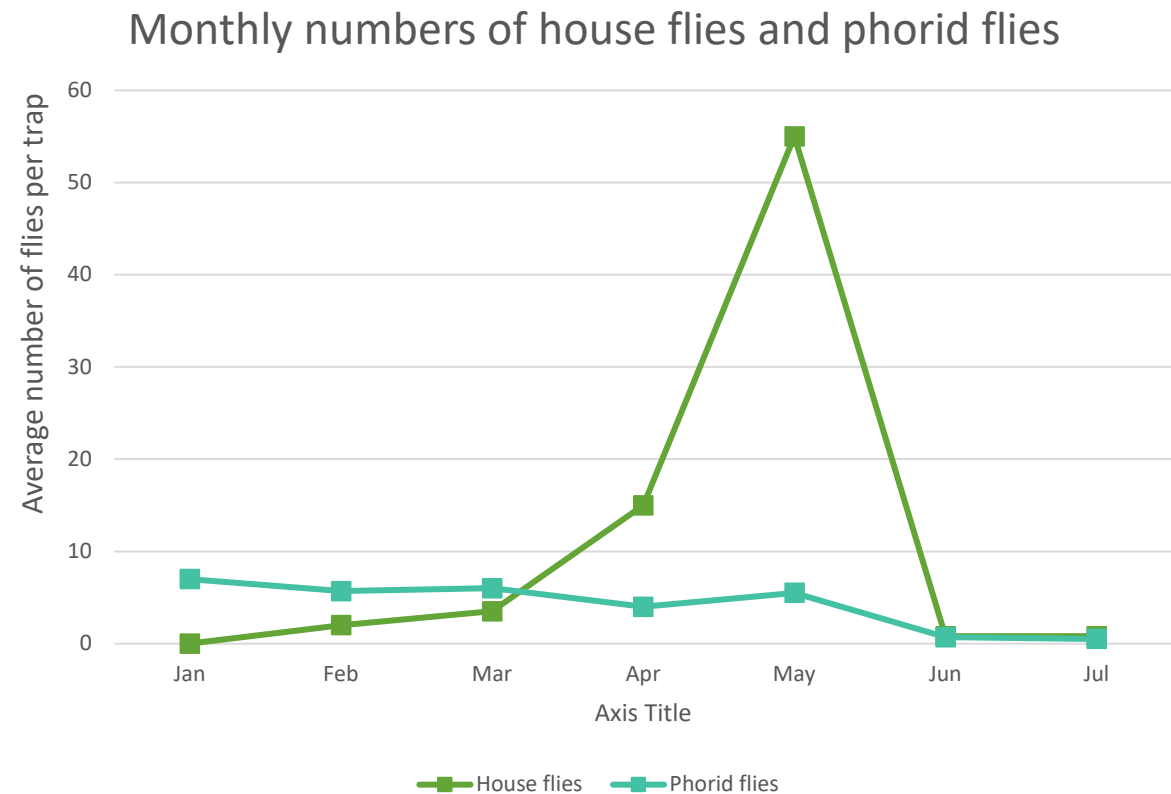


Averaging trap counts provides an overall picture of what is going on in an account

During what season are house flies a problem?

During what season are phorid flies a problem?

How effective was the baiting and sanitation effort initiated in June?





Types of traps

Passive traps collect insects without a lure

Active traps use an attractant to draw pests into the trap

Sticky traps use glue to trap insects on a card or tray

Pheromone traps are a type of active trap using an attractive insect hormone as a lure

Light traps make use of insect attraction to certain wavelengths of light

Pitfall traps are devices that capture insects with the assistance of gravity



Pitfall traps make use of a pest's lack of climbing or flying ability

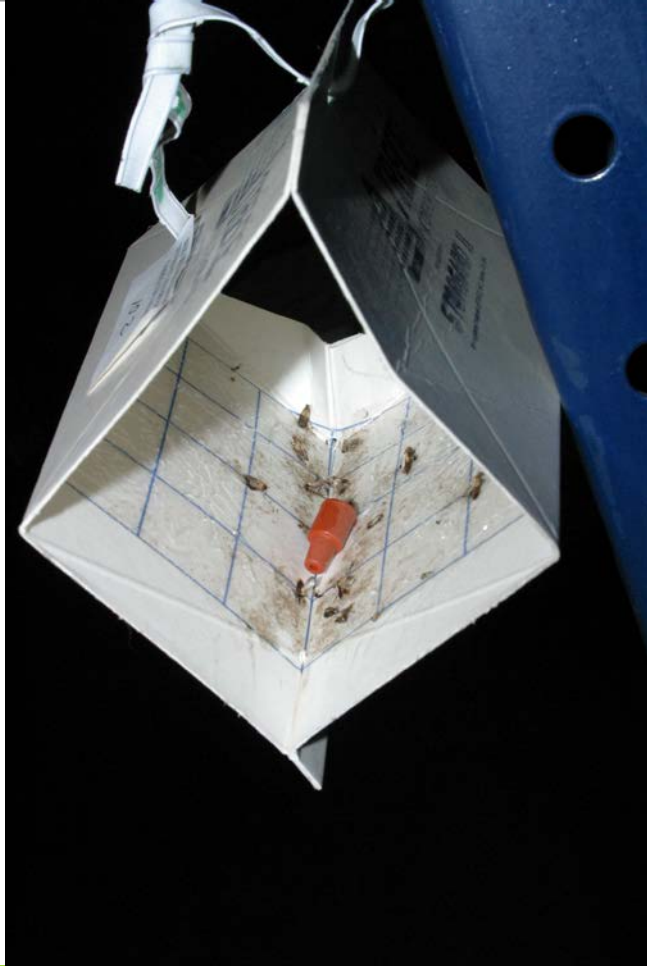


Pantry beetle trap and lure



Bed bug interceptor cup under bed foot

Pheromone lures are very powerful



Reasons for use of pheromones

Detect low-level populations of pests before they become a problem

Help reduce pesticide use by helping locate and spot-treat localized infestations

Help evaluate the effectiveness of the pest control program

Decrease insect visibility

Can be used to confuse mating and reduce infestations



From <https://www.mothtrapsdirect.com/>



Placement of pheromone traps in warehouse

Monitoring and thresholds

Monitoring results allow us to know whether we need to take corrective action, and what that action should be



What is a threshold?

- *Thresholds* are boundaries between tolerable and intolerable pest levels
- Each pest/site will have its own threshold
- May be multiple thresholds for any pest



No such thing as a threshold of zero...

Thresholds can be greater than or less than one (e.g, average number of cockroaches per trap 1 cockroach in 100 traps=0.01)

Different actions may be triggered by high, medium, low numbers of pests

Having a threshold shows that you've thought through your IPM response

Brown banded cockroaches on glue board



Level 1 \$

Level 2 \$\$

Level 3
\$\$\$

Thresholds can be linked to specific responses

- *Level 1 Response* (say, <1 cockroaches / trap)
 - Increase inspection frequency
 - Conduct informal or formal training with kitchen staff
- *Level 2 Responses* (say, an average of 1-5 cockroaches / trap)
 - Place cockroach bait stations
- *Level 3 Response* (say, > 5 cockroaches/trap)
 - Apply dusts, aerosols, crack and crevice treatments
 - Pull and deep-clean kitchen equipment



Thresholds can also vary by location

Red imported fire ant

Location	Threshold	Action
Sports fields	4-5 mounds for bait application, <4 mounds direct treatment	Broadcast baits at 1.5 lbs per acre when justified. Individual mound treatments with liquid drenches (pyrethrins drench preferred)
Building perimeters	Single mound within ten feet of inhabited structures	Apply individual mound treatment using liquid drench (pyrethrins drench preferred). Sensitive building perimeters treated with ten-foot barrier fipronil granule.
Indoors	Respond to all complaints; treat when more than one ant observed per classroom	Use approved cleaner on ant trails, apply pyrethrins spray to ant entry points, if necessary, in emergency. Look for, and treat, fire ant mounds outdoors, outside infested rooms.



Who determines thresholds?

Health and safety thresholds

- Generally low tolerance for pests with high health and safety risk (rodents in attics, fire ants near nursing homes)

Personal tolerance thresholds

- Set in consultation with customer
- May vary from account to account

Legal thresholds

- Local health department standards
- Institutional policies

Economic thresholds

- When a dollar value can be placed on damage caused by different levels of pests
- Less common in structural pest control

Review thresholds/expectations ahead of time or at time of sale



Reporting your findings

IPM has high standards for reporting

Should include

- Sanitation and maintenance needs
- Pest signs and presence
- Actions taken including
 - Times in/out
 - Technician name
 - Non-chemical methods
 - Pesticide identification, location and quantities

Good reporting protects you and your people

Key to Materials/Chemicals Used					
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Maintenance Needs:
Pestproofing:
Conditions conducive to pests (birds, wildlife, termites, etc.):
Hazards:
Other comments:

“Integrated” is the first letter in IPM

IPM is based on using multiple control tactics

Well balanced IPM plans focus on excluding and making the environment unsuitable for pests.

Pesticides should be in a supporting, not leading, role

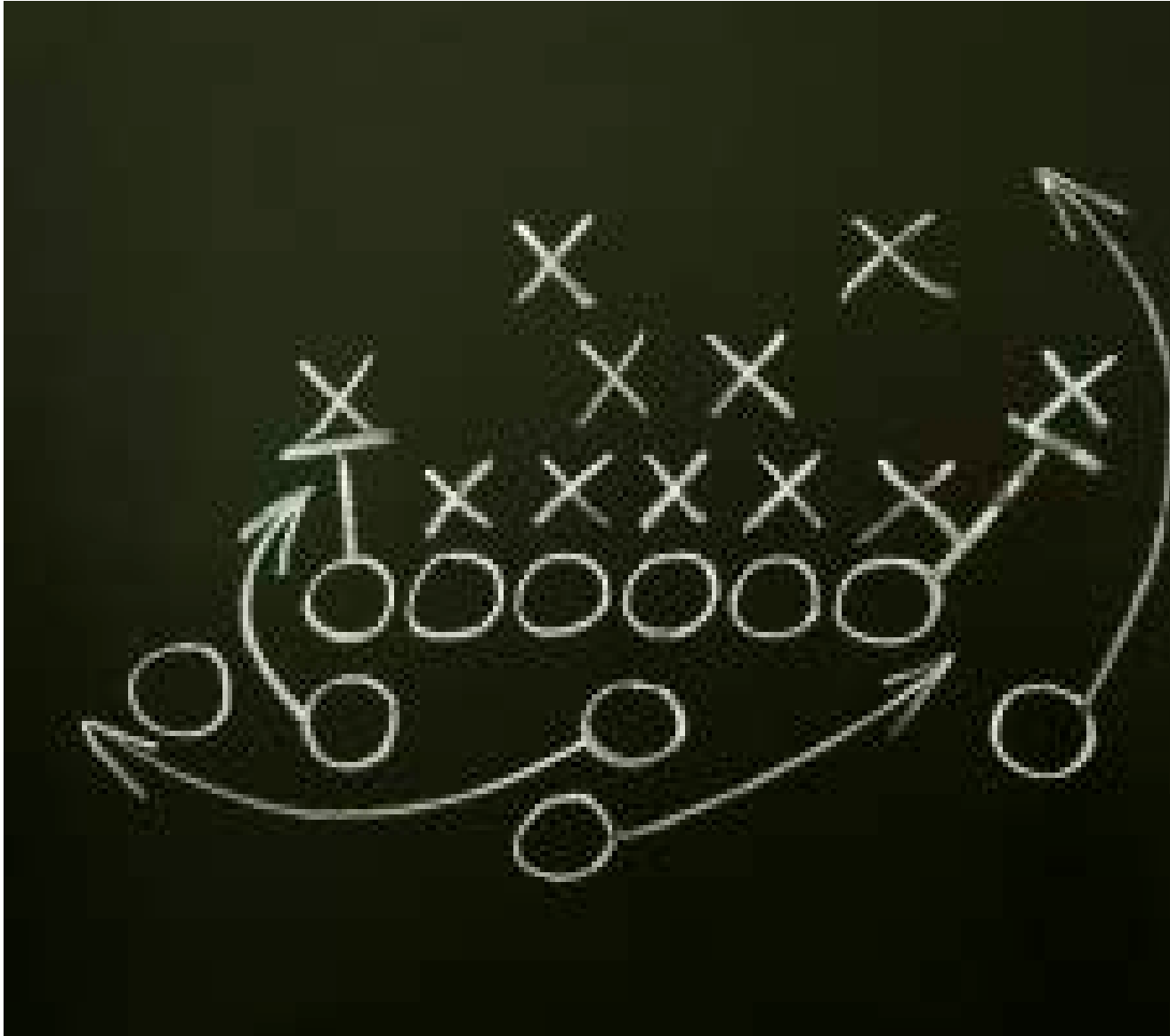


Tactics and strategy in IPM

Tactics are the tools of IPM

- Snap Traps
- Sticky traps
- Light traps
- Exclusion materials
- Baits
- Sprays
- Dusts
- Biologicals
- Granules
- ULVs and aerosols
- Drain guards





Strategy is the overall plan

STRATEGY IS HOW AND WHEN YOU USE SPECIFIC TACTICS



IPM Tactics

PEST PROOFING



IPM Tactics

SANITATION



IPM Tactics

QUARANTINE / QUALITY CONTROL



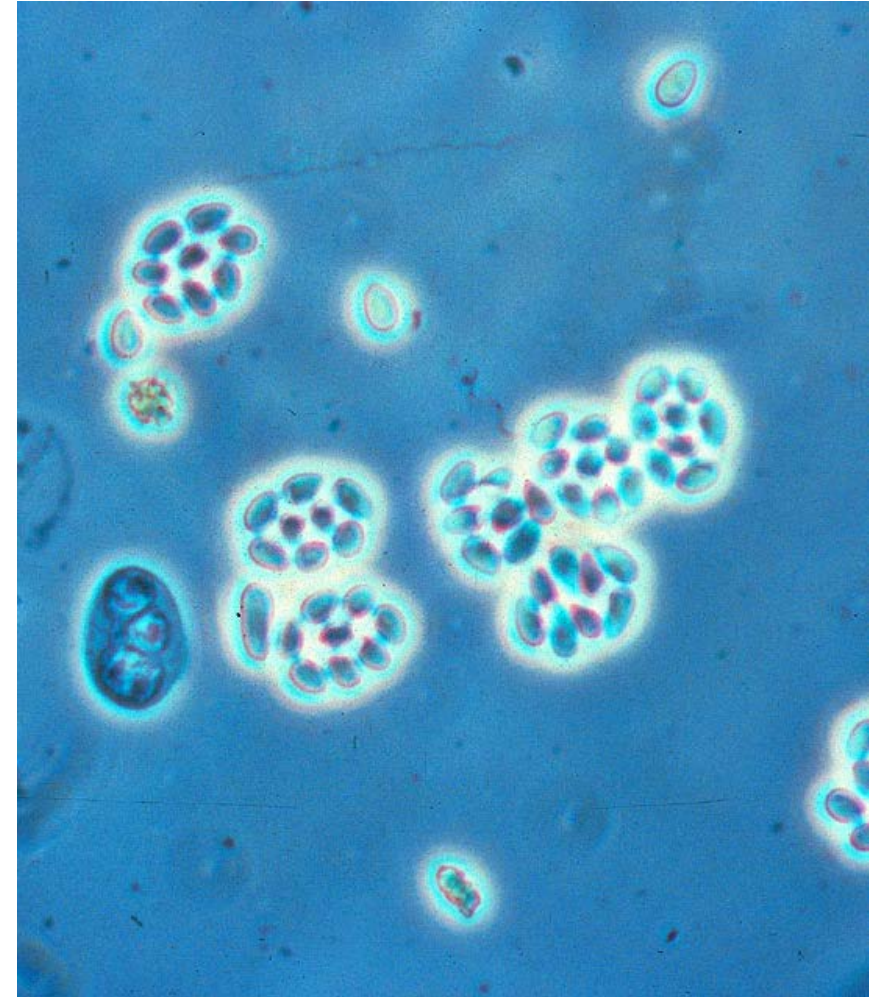
IPM Tactics

MECHANICAL CONTROL



IPM Tactics

PHYSICAL CONTROLS (HEAT, COLD, LIGHT)



IPM Tactics

BIOLOGICAL CONTROL (USE OF LIVING ANIMALS TO CONTROL PESTS)



IPM Tactics

PESTICIDES

Teamwork is what makes IPM work

IPM is people-oriented

Communication skills are as necessary as technical skills

Education is the most often over-looked IPM tactic





Education:

Consider client education part of your overall IPM strategy

Consider alternative means of education

- One-on-one interaction during service visits
- Explaining IPM report results
- Group training on clients' role in the IPM program
- Newsletter articles and blog posts, email alerts, Twitter, YouTube links, etc.

A quality education program can make your company stand out from the rest

Which of the following best describes IPM?

A managing pests without pesticides

B managing pests with organic pesticides

C managing pests with multiple control tactics

D managing pests any way I can



Which of the following would be an example of an IPM strategy?

Use of crack and crevice baits

Judicious use of insecticides in harborage areas

Reposition dumpster, institute door policy, install air curtains and light traps

Institute posting of treated areas

IPM In Practice Question

The following actions were taken by one school's kitchen staff: kitchen equipment was put on a cleaning schedule; increased sanitation efforts were made; the location and number of pests seen were reported; repairs of leaking pipes were requested.

See next slide

The actions are an example of:

The actions are an example of:

an inefficient
sanitation program

a school with a pest
problem

cooperation in an
IPM program

all of the above

Questions?

