RESILIENCE, EMERGENCY PREPAREDNESS, ADAPTATION: HOW IPM TIES IN?

IPM
makes sense

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What do these words mean?

In a general human context…

- Resilience
- Emergency preparedness
- Adaptation

ARE YOU PREPARED?

adaptation

noun [C/U]

US /ˌæd·əpˈteɪ·ʃən, -ˌæp-/

BIOLOGY

a characteristic of a plant or animal that makes it able to adjust to the conditions of a particular environment

resilience

noun [U]

UK /rɪˈzɪliəns/ US /rɪˈzɪljəns/

(also formal **resiliency**)

the quality of being able to return quickly to a previous good condition after problems:

emergency

noun [C or U]

UK /ɪˈmɜː.dʒᵊn.si/ US /ɪˈmɝː.dʒᵊn.si/

B1

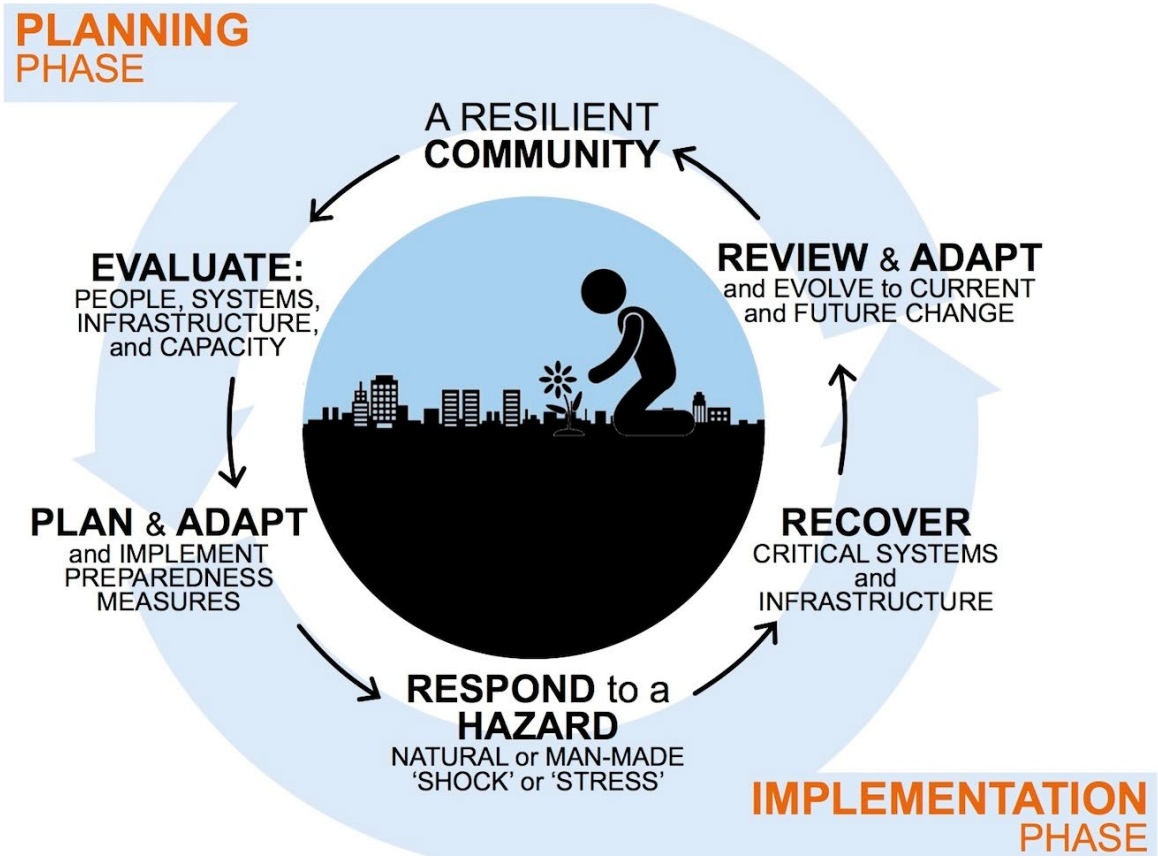
something dangerous or serious, such as an accident, that happens suddenly or unexpectedly and needs fast action in order to avoid harmful results:

How is Resiliency different from Emergency preparedness and Adaptation?

- Humans are generally highly adaptable, having a plan helps further.
- Emergency preparedness deals with having plans in place for communities to respond when an emergency happens.
- Resiliency planning goes **beyond** traditional emergency preparedness, it explores and addresses the underlying causes to hazards and vulnerabilities.

How is Resiliency different from Emergency preparedness and Adaptation?

- Resiliency planning links together the environment, social, and economic sectors to holistically improve communities by being adaptable to changing conditions.



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What do these words mean?

Considering pests and pest management…

- Resilience
- Emergency preparedness
- Adaptation


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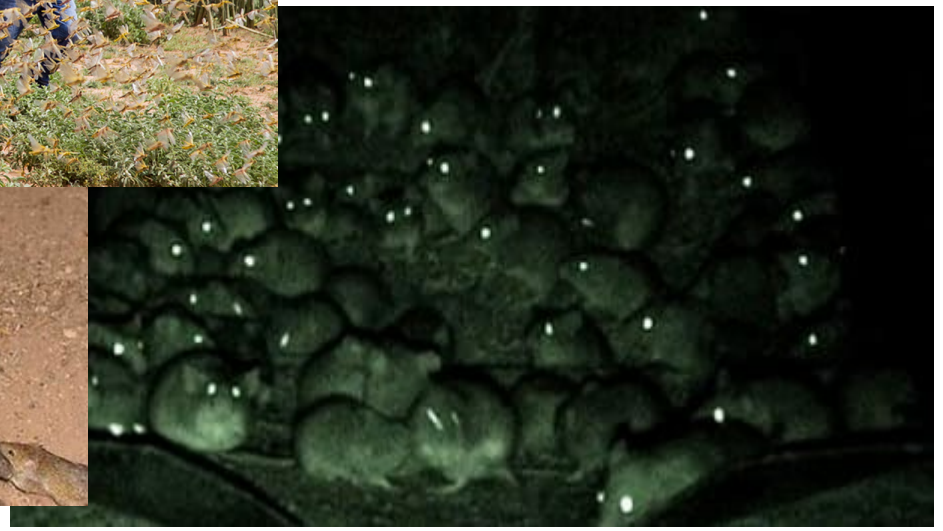
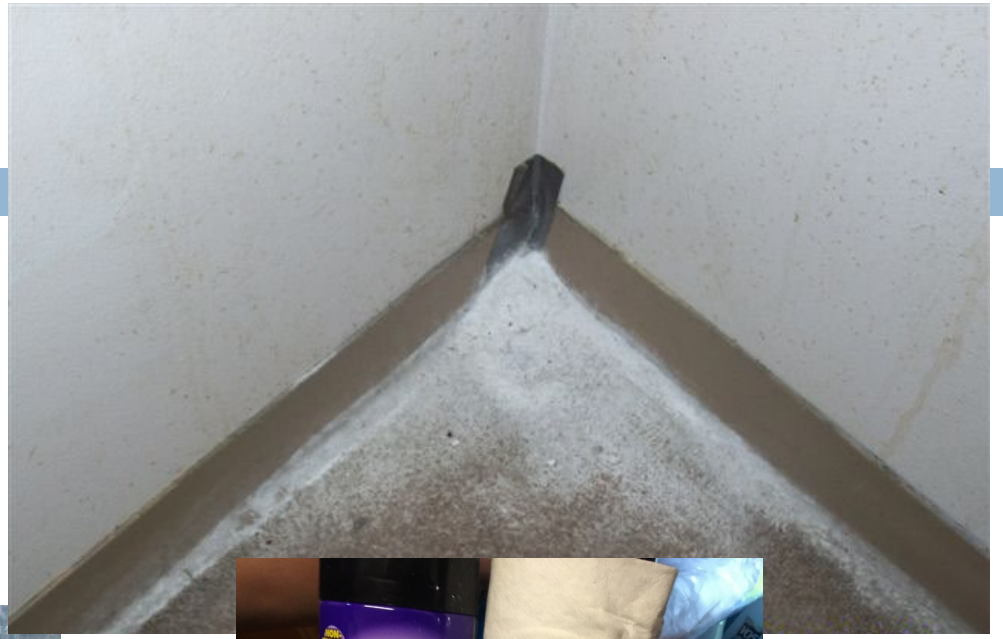
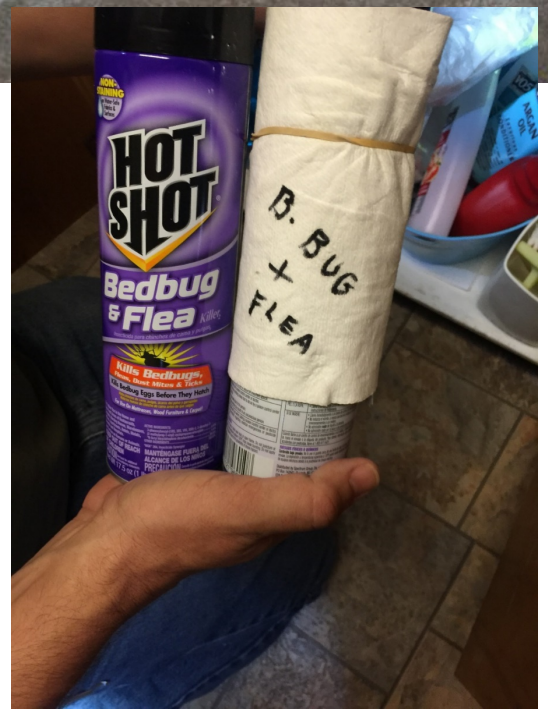
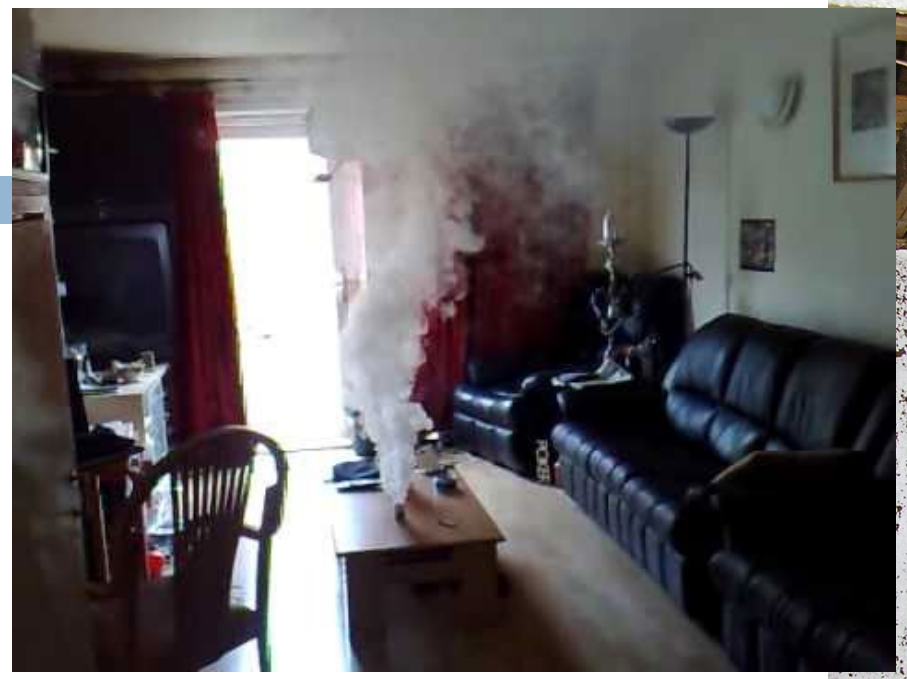



HOT SHOT
Bedbug & Flea
Home Insect Killer
Kills By Contact!
ORTHO
HOME DEFENSE
INSECT KILLER
BUG BARRIER
ORANGE SWIRL




HOT SHOT
Bedbug & Flea
B. BUG + FLEA



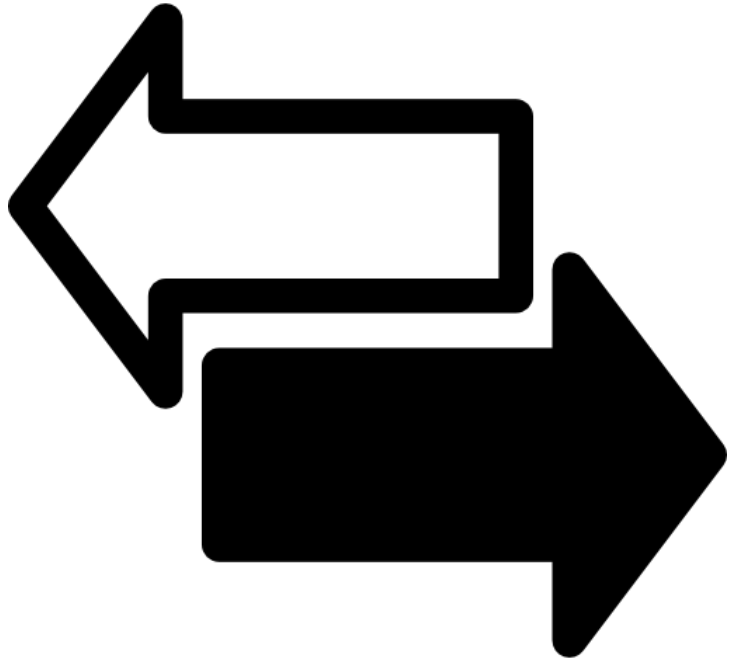
Emergency situations

CLIMATE-CHANGE RELATED

Includes planning for pest outbreaks following natural disasters

NON-CLIMATE CHANGE RELATED

Includes planning for pest outbreaks in normal weather conditions



How do you measure resilience

- Resilience means different things to different people, communities and regions.
- What may be a large hazard or threat in one area e.g., the potential for earthquakes in San Francisco may not even be a thought for Phoenix.
- Pest threats differ in different regions.
- This makes the concept of resilience even more **difficult to define and measure**.

IPM and Resilience?

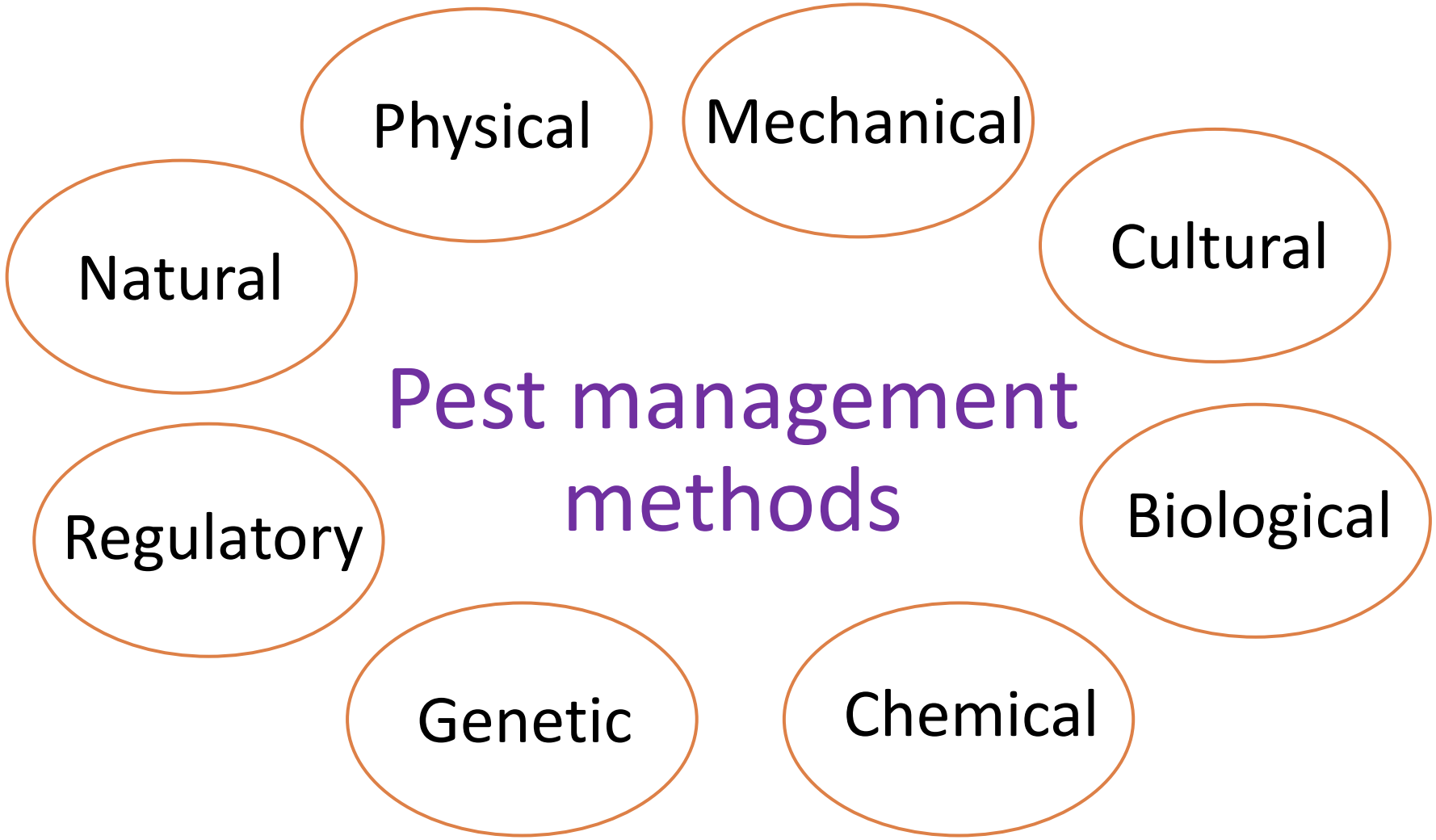
IPM = Integrated Pest Management = Intelligent Pest Management

- Promotes environmental health

IPM Works indoors and outdoors!

Why do IPM?

- IPM is more effective and proactive
- IPM is sustainable
- IPM reduces risks
- IPM is cost effective
- Prepares you for the worst


Physical
Mechanical
Natural
Cultural
Pest management methods
Regulatory
Biological
Genetic
Chemical

IPM components

Each environment/situation is different!

But IPM components are similar:

- Proper identification
- Regular monitoring
- Plan of action
- Being proactive
- Multiple tactics
- Education and communication

An IPM Plan is a Resilience Plan

- Having an **integrated pest management (IPM)** program in place is very helpful.
- IPM focuses on exclusion, maintenance, and sanitation as methods to control pest populations, using chemical treatments as a last resort.
- Implementing these strategies can help keep pests out **before, during** and **after** an emergency/outbreak.

Vulnerability

Children and elders are still the most vulnerable members of society

IPM is STILL the best approach

The **greatest** advantage to adopting an IPM approach NOW is that when emergency occurs, you:

1. ***Know because you are already looking***
2. ***Know what is likely to pose risk because you are informed***
3. ***Know what the most effective steps to take are to protect your community because you are knowledgeable about appropriate tools and strategies***

IPM tactics that can be used during an emergency

- **Continued emphasis on monitoring** is crucial to identifying pests, habitats and conducive conditions.
- **Encourage sanitation** and pest habitat reduction (Often difficult after emergency).

IPM tactics that can be used during an emergency

- Stress simple behaviors like bagging food-related trash and placing it in sealed bins (every little thing counts when attempting area-wide fly and rodent control).

IPM tactics that can be used during an emergency

- Keep focused on stressing the basic principles of IPM — cultural, physical and mechanical control prior to using chemical products.
- **Exclusion:** Inspect and replace/ repair damaged window or door screens and other new openings into the structure.

IPM tactics that can be used during an emergency

- Use all the **mechanical control** tools available (jar/bag traps or mosquito ovitraps, sticky traps, single and multi-catch traps, glueboards, etc.).

IPM tactics that can be used during an emergency

- **Chemical pesticides** may have to be used in certain circumstances.
- Choose wisely, and remember, pesticides kill pests, but do not prevent them.
- As long as food and habitat is available, pests will continue to thrive.

Developing resiliency plans

CLIMATE-CHANGE RELATED

NON-CLIMATE CHANGE RELATED

Developing a resilience plan

Climate related

Locality and Seasonality

- Be connected with local weather information to keep yourself and your community alert.
- Some extreme-weather events are seasonal in some localities. E.g., hurricanes, tornados, floods and fires.

Developing a resilience plan

Climate related

- Seasons play an important role in preparedness practices, e.g.,
- Summer = wildfires and floods
- Winter = blizzards and cold temperatures.
- Spring to late summer = Tornado season, depending on where you live.

Developing a resilience plan

Climate related

- Pests hate extreme weather too!
- In the southeast, hurricanes and floods lead to rising water levels and pests seek dry ground to escape flooding.
- For Western states, wildfires are a frequent threat, so pests seek cooler spots to escape the heat.
- In Northern states, snow and freezing temperatures drive pests indoors as they try to keep warm.

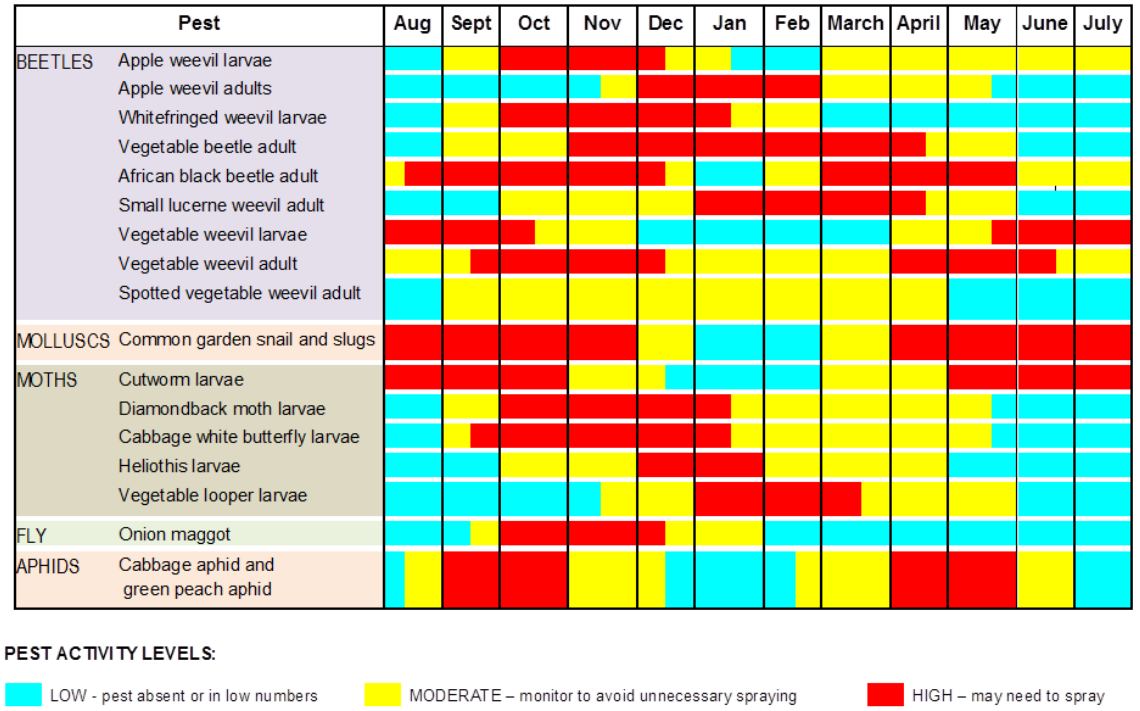
Developing a resilience plan

Climate related

Identifying the pests

- Once you have a calendar of possible extreme weather events, here are a few pests to watch out for, and tips on how to avoid them:

Guideline to pest activity. Always monitor.



Developing a resilience plan

Climate related

Identifying the pests

- Ants can move their entire colony when disturbed.
- Carpenter ants make their home in wet or rotting wood, often invading their new residence en masse.

Easily burrow their way through damaged fences, fallen tree branches, and any other damaged wood near a facility.

Developing a resilience plan

Climate related

Identifying the pests

- Fire ants are survivalists during floods.
- Seek higher ground to escape the rising waters, but if shelter can't be found, they can bond together in the thousands to create a floating "raft" to survive the water.
- Fire ant stings are extremely painful, so preventing ant piles from growing around a facility should be a top priority.

Developing a resilience plan

Climate related

Identifying the pests

- Tip: Routinely check facility grounds for ant mounds. If one is spotted, use safe measures to eliminate a potential encounter.

Developing a resilience plan

Climate related

Identifying the pests

- Cockroaches are attracted to the trash and litter left behind after a disaster.
- Roaches love warm, damp, and dark conditions. They are also expert hiders — so seeing one during the day can mean many more are hidden in the walls.

Developing a resilience plan

Climate related

Identifying the pests

- Tip: Daily sanitization of a building can help prevent cockroach populations from building up before an emergency happens.
- Drains are a hot spot for roaches, so take measures to prevent food and residue from building up in the kitchen and bathrooms.

Developing a resilience plan

Climate related

Identifying the pests

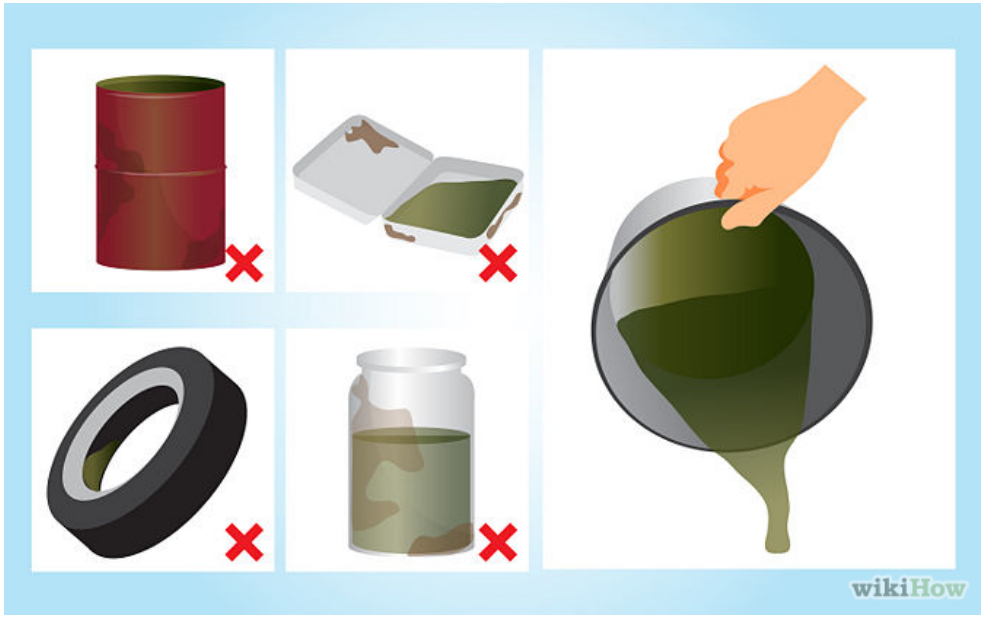
- Mosquitoes love standing water and only need a few inches of it to breed.
- In addition to irritating the people they bite, mosquitoes can spread harmful diseases.

Developing a resilience plan

Climate related

Identifying the pests

- Tip: Promptly remove standing water or small puddles around a building.
- Overturn any empty containers that could fill with water and be sure to clean storm gutters to prevent standing water from accumulating.



Developing a resilience plan

Climate related

- Receding flood waters often they leave behind many pools of stagnant water and organic debris. These are prime breeding sites for adult mosquitoes and nutrient rich larval habitats.

Developing a resilience plan

Climate related

Identifying the pests

- Rodents will search for higher ground and dry land.
- Damage to a building opens a variety of locations for displaced rodents to call home.
- They can worsen damage to a building and even start fires by chewing on electrical wires.

Developing a resilience plan

Climate related

Identifying the pests

- Tip: Clear debris in and around a facility immediately. Cardboard boxes, broken sheetrock, old equipment, and any other damaged materials offer harbors.
- Seal holes and cracks in both interior and exterior walls to keep rats and mice out.
- Clear and trim any overgrowth or damaged vegetation outside of your facility to limit easy shelter for rodents.

Developing a resilience plan

Climate related

- **OPPORTUNISTIC INVADERS: Flies and rodents**
- These are an important group of pests that flourish after an extreme weather event, especially involving flooding.
- Extended power outages, and damaged, overflowing sewer systems cause drastic landscape changes, leaving behind spilled sewage, spoiled food and rotting vegetation/landscape materials all of which are attractive to both flies (feeding and egg-laying sites) and rodents (feeding and harborage).

Developing a resilience plan

Climate related

- Massive increases in populations occur
- This drastically increases the frequency of contact with people, and spreading of potential diseases.

Developing a resilience plan

Climate related

- **SAFETY FIRST!** During recovery and clean-up efforts, your safety and the safety of your co-workers and clients are of utmost importance.
- As you assess, inspect and repair structures, remember conditions are potentially hazardous and displaced pests are much more likely to be encountered.



Developing a resilience plan

Climate related

- **Protect yourself!** When performing inspections or service, always wear an EPA-approved mosquito repellent and keep your eye on the clock to remember the reapplication interval.
- Stock up on repellent before a storm, an extra container is always useful!

Developing a resilience plan

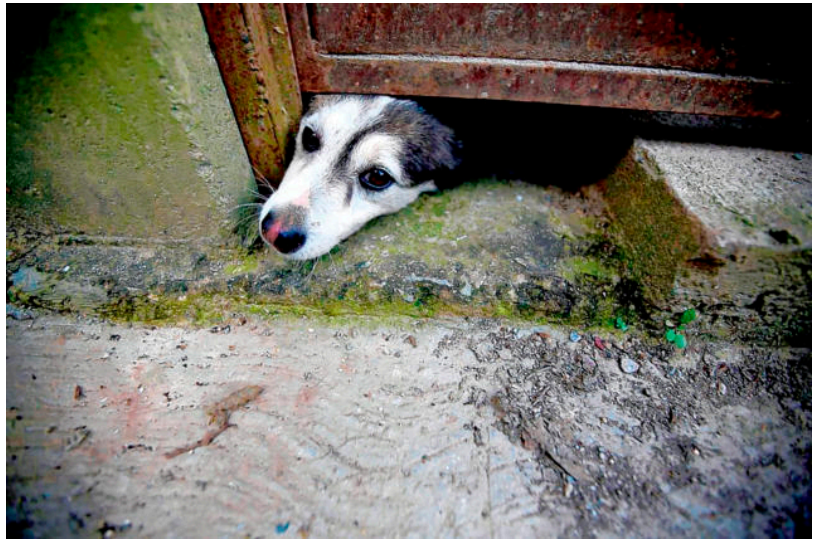
Climate related

- When working in uncommon situations, always have extra PPE with you, in case one gets damaged.
- Before looking for pests, know your surroundings, watch for debris and test the area you are operating in for structural or landscape integrity.
- Remember to stay hydrated. Working long hours in high heat and humidity can lead to heat stress.

Developing a resilience plan

Climate related

- Be careful when working around debris piles or damaged structures and always remember that something may be hiding below.
- Wildlife (animals other than rats/mice) are stressed and scared too. If present, do not immediately approach them or try to trap/remove them.
- Allow licensed wildlife removal specialists to trap and remove animals.



Developing a resilience plan

Climate related

- Ensure that moisture drainage systems are functional.
- Clear debris from drainage systems/canals to help remove standing water in areas and inspect, clean, or repair clogged or damaged gutters.

Developing a resilience plan

Climate related

- **During an emergency and after, pest management is often the last thing on your mind.**
- Keep focused on the basic principles of IPM.

Developing a resilience plan

Non-climate related

Example : German cockroach infestation

Cockroach allergy

In a home or building, are cockroaches as bad as bed bugs or not?

More people deal or live with cockroaches and associated problems than any other indoor pest!

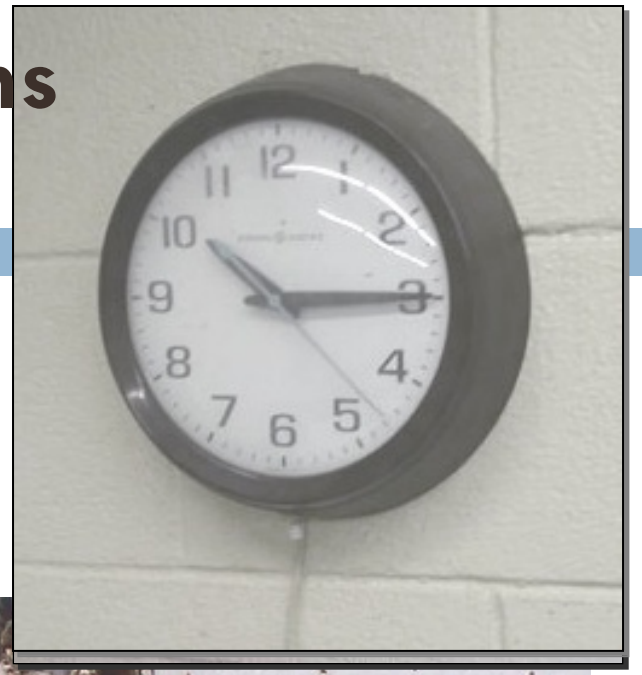
Cockroach allergy

Symptoms

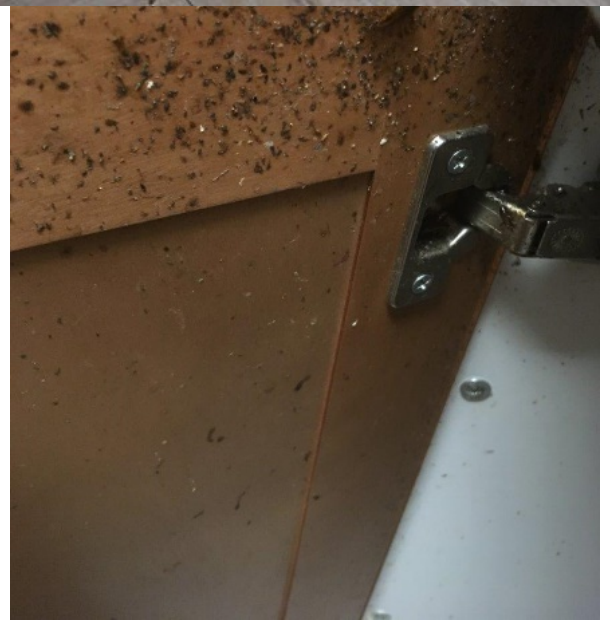
- Chronic stuffy nose
- Frequent ear and sinus infections
- Itchy eyes and nose
- Persistent cough
- Shortness of breath
- Wheezing
- Chest tightness
- Rash

German cockroaches – recognize signs

German cockroaches – recognize signs



German cockroaches – recognize signs



German cockroaches – recognize signs

- Kitchen
  - Check range, lifting up burner coils and looking under the pans.
  - Check inside oven for food remains or debris

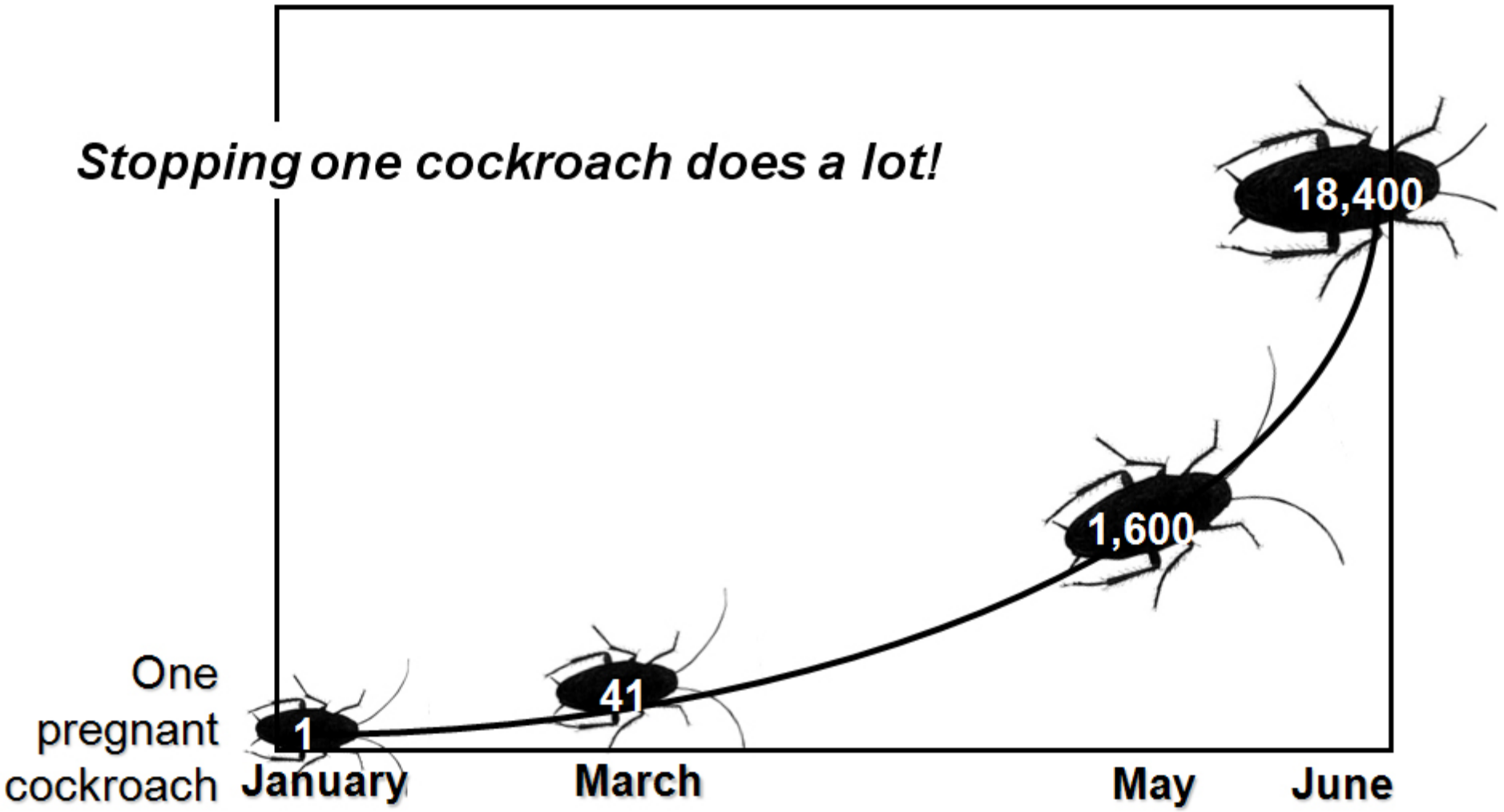
German cockroaches – recognize signs

- Kitchen
  - Check under sink for leaks or cracks

German cockroaches – recognize signs

- Kitchen
  - Open and check kitchen cabinets for fecal stains inside and around doors
  - Check pantry or other food storage area for open or leaking containers

German cockroach population increase



German cockroach management plan

- Know the cockroach species and its biology
- Ensure cleanliness, good sanitation
- Don’t provide food, water and shelter
- Act promptly, monitor regularly
- Use least toxic materials

Intensive cockroach management

- Thorough cleaning
- Wherever possible, sealing cracks, gaps
- Using **compressed air** to flush cockroaches out (set up sticky trap perimeter and vacuum them as they emerge)
- When reasonable non-chemical measures fail, use **baits.**
- Use bait stations or gel placement devices

Intensive cockroach management

Chemical methods:

- **Baits work best**
- Spray applied liquids are usually less effective for cockroaches, plus they cause unnecessary exposure, and repeated sprays cause residue buildup
- Sprays also interfere with baits by repelling cockroaches from treated areas

Intensive cockroach management

What are thresholds? For what kind of area and size, for what species, how much time?

A **single adult** in PVAs (pest vulnerable areas) is ground for additional inspection and monitoring. Other areas, depending on the conditions prevailing.

German cockroaches are mostly encountered, but applies to any others also.

Assuming regular monitoring of at least weekly.

Intensive cockroach management

What is a spot treatment? What areas can we spot treat?

"**Treatment**" can refer to **non-chemical** methods also!
Spot treatment is for a localized area where the pest problem is suspected or confirmed (e.g., a kitchen pantry, a bathroom).

Intensive cockroach management

- Avoid resistance!
- Use a variety of baits (active ingredients, formulations)
- Incorporate IGR's & boric acid products
- Integrate new chemistries (chlorfenapyr, indoxacarb, acetamaprid)
- Rotate through different baits every 3 – 4 months
- If the problem persists don't keep doing the same thing: **It Isn't Working!**

Intensive or emergency plans for other pests

- Similar intensive plans can be built for other pests – bed bugs, filth flies, rodents, mosquitoes
- Having a plan in place is the first step
- Providing staff with necessary training and support to implement the plan is next

Concluding thoughts

- Generally resilience is defined as the ability to adapt to, withstand, or **rapidly** recover from a severe event.
- Communities with greater capacity – access to human, social, political and economic capital – and greater capabilities in developing, acquiring or exchanging these resources, are more likely to be resilient in the face of emergency.

Community resilience

- Be aware that resilience is a dynamic phenomenon and not an end by itself.
- It's always changing, and we have to retain that awareness because as environmental or economic conditions change, we have the capacity to adapt.

Contact

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