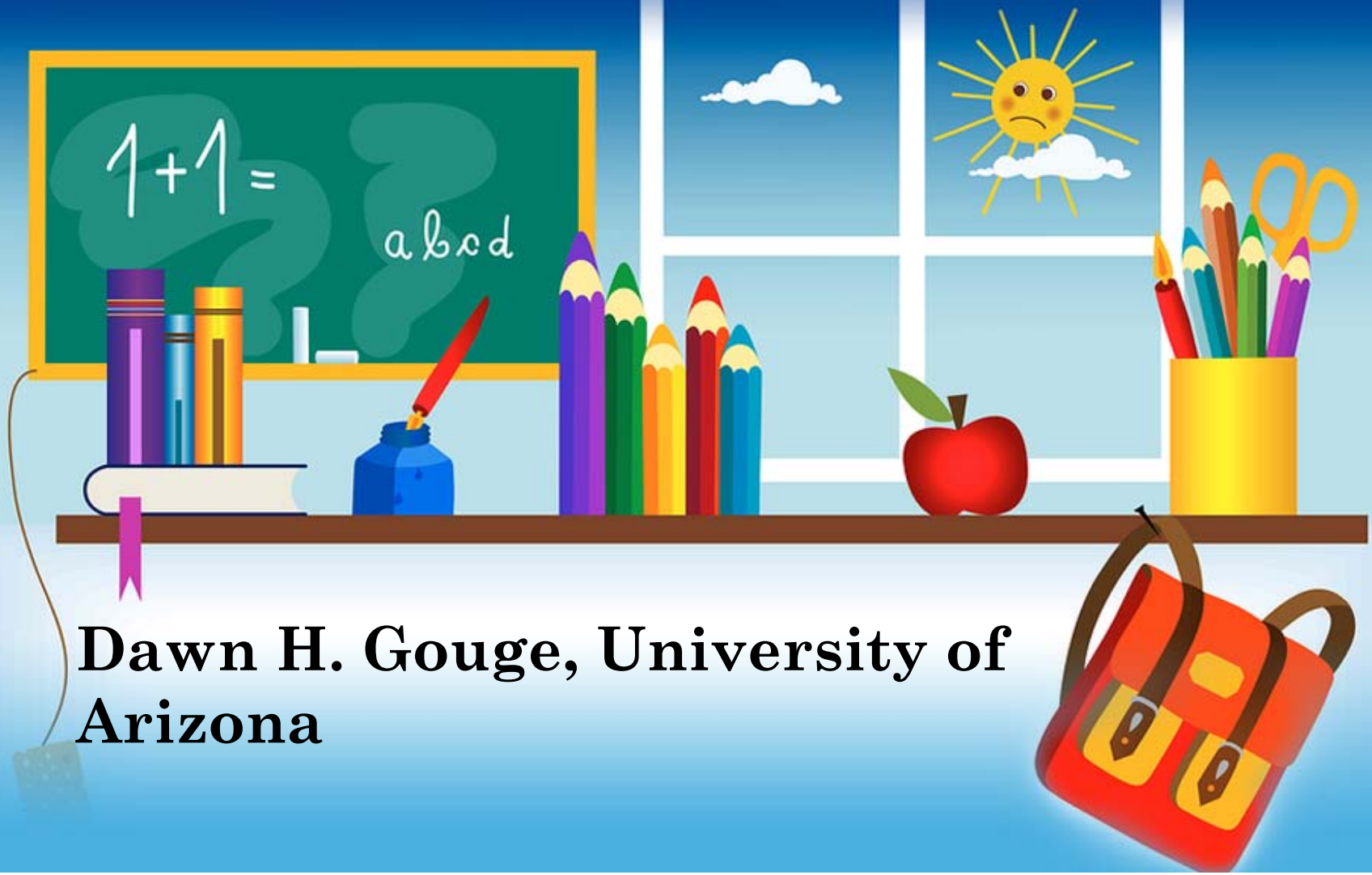
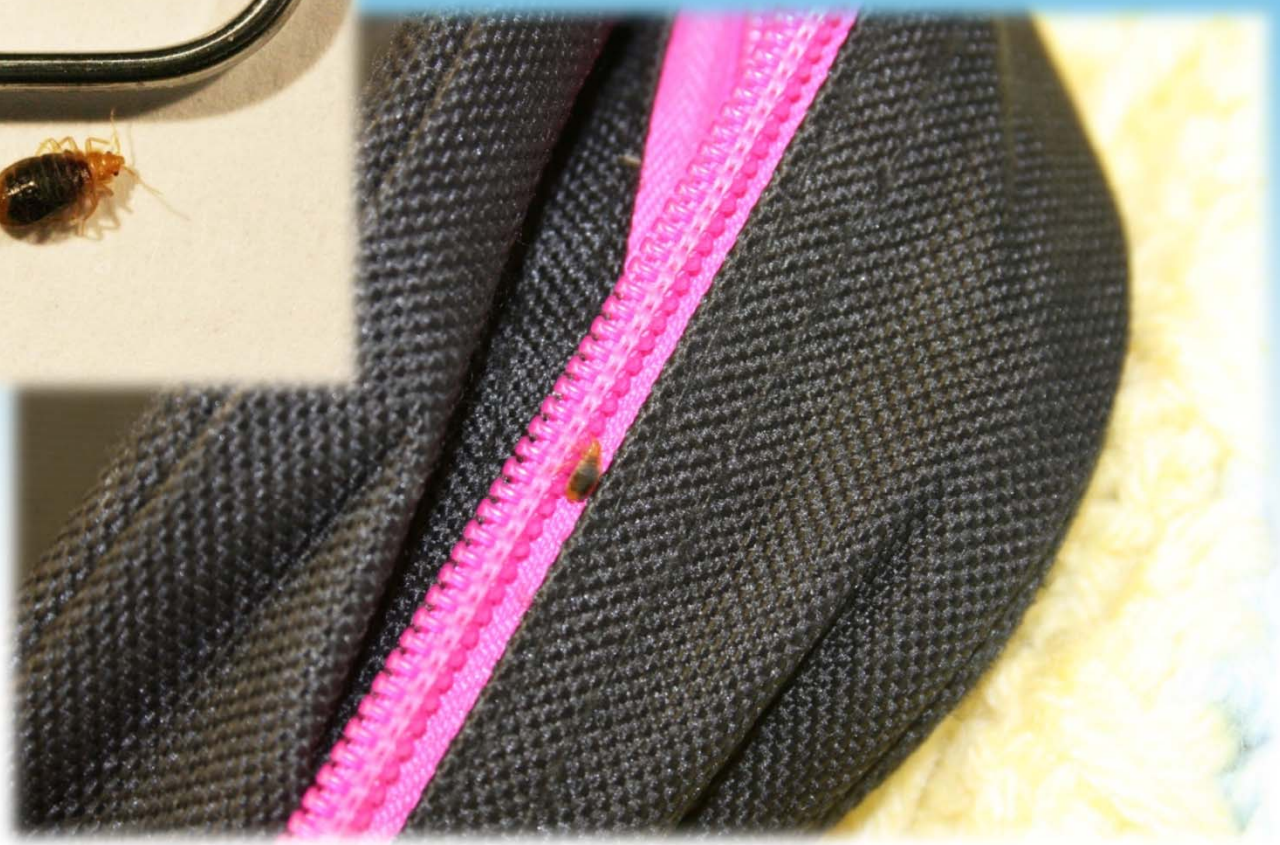
Special Pest Management Considerations for Schools - "Demand-side IPM vs. Supply-side IPM"

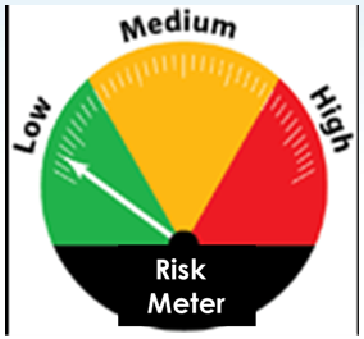


Dawn H. Gouge, University of Arizona

Most significant school
panic pests

Panic pest #1
Cimex lectularius Bed bugs





The Charter School of Educational Excellence in Yonkers fumigated for bedbugs

February 27, 2014

According to parents, a teacher found bedbugs inside first-floor classrooms on Monday and exterminators weren't contacted until the next day. …. While they fumigated the entire school, they believe the infestation was only in one area.

Ghastly consequences

- **School closures**

Hazardous pesticides found in back packs

Ghastly consequences

Paradichlorobenzene
Dichlorvos
Naphthalene

Ghastly consequences

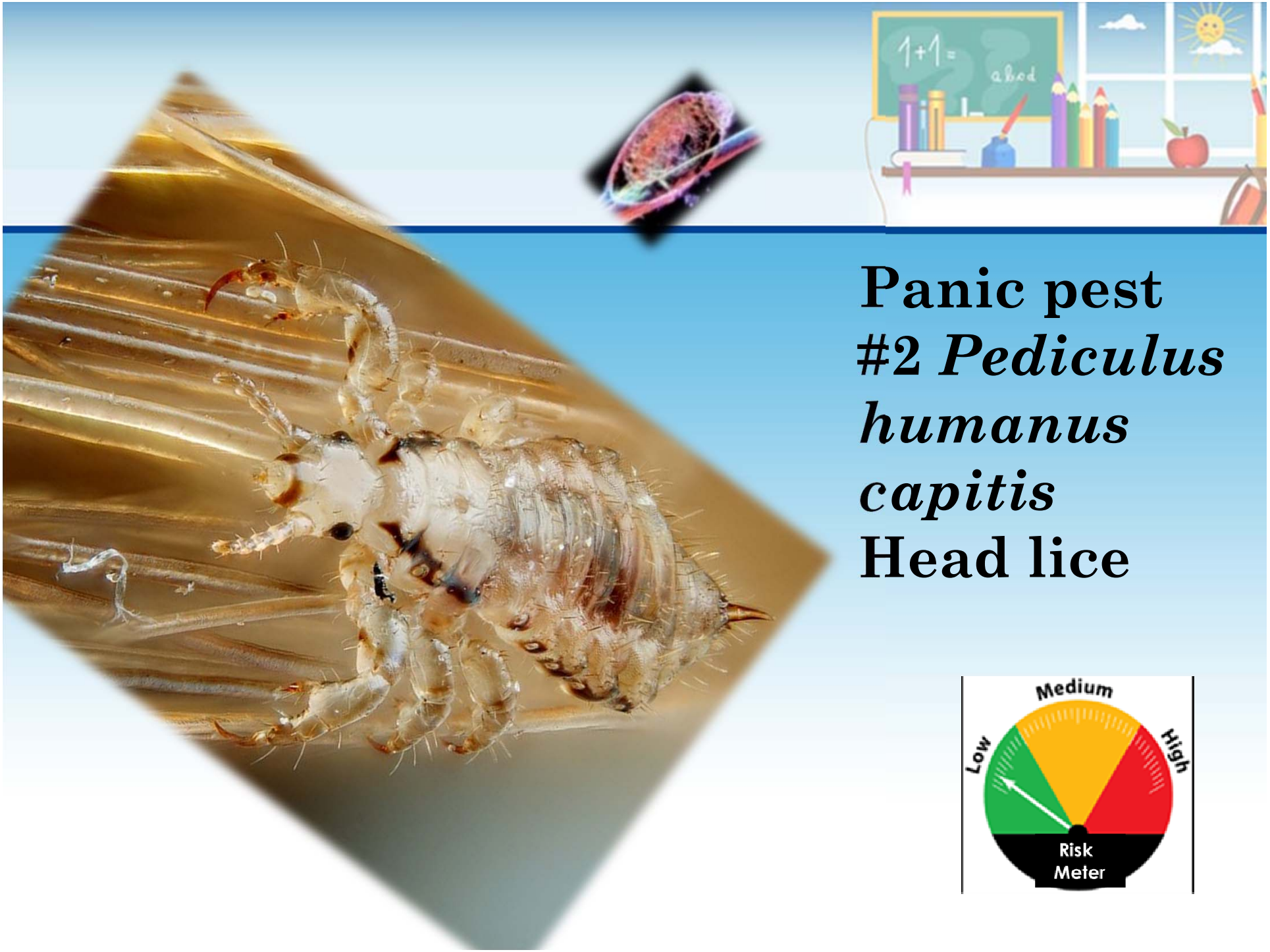
Schools may be transition sites

Ghastly consequences

- Students missing months of school
- District financial loss
- Inappropriate pesticide use

Appropriate action

- If carrier is known work with parents and/or individual to help them attend school free of bed bugs
- Have a bed bug policy
- Someone on speed-dial who can ID a bed bug
- Reduce clutter (if necessary)
- Deep-clean class
- Monitor classroom



Panic pest #2 *Pediculus humanus capitis* Head lice

Ghastly consequences

- Over diagnosed (1% is normal)
- Unnecessary days lost from school (12-24 M days lost annually in U.S.)
- Pesticide exposure and hazards
- Millions of dollars spent by parents and lost by schools (school losses estimated at $500 M per year)
- Pesticides applied to school busses

Ghastly consequences

Appropriate action

- Support school nurses so they can accurately ID head lice
- If carrier is known, work with parents to provide them with safe, effective remediation steps

Panic pest #3 *Sarcoptes scabiei* Scabies mites

Transmission is rapid under crowded conditions that facilitate skin-to-skin contact

Ghastly consequences

- Pesticides applied to school buses
- Pesticides applied to classrooms
- Sterilants and high level disinfectants applied to classrooms incorrectly
- **<u>Skin burns!</u>**

Appropriate action

- Classrooms should be cleaned and vacuumed after use
- Once carrier is treated they can return to school

Panic pest #4
Western yellowjacket *Vespula pensylvanica*

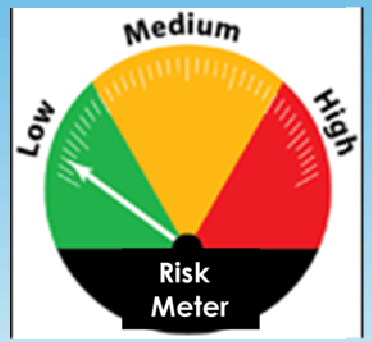
Ghastly consequences

- Stings are painful
- Allergic/hypersensitivity reactions

Appropriate action

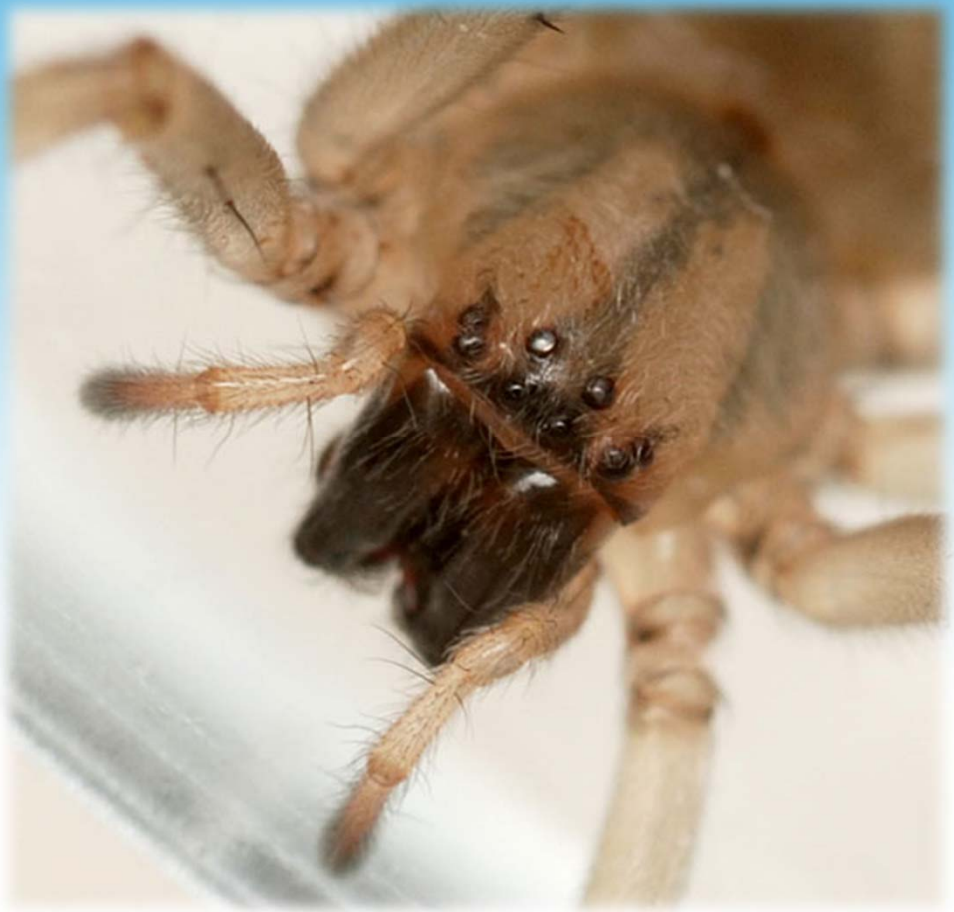
- Knock down new nests
- Keep foods and drinks in indoor areas
- Self-closing trash cans
- Wasp nests must be eliminated by professionals

Panic pest
#5 Spiders *Latrodectus* (Widow), *Loxosceles* (Recluse), or *Cheiracanthium* (Sac)



Ghastly consequences

- PMP sprayed external lockers with malathion



- Vacuum
- Educate
- Yellow bug lights

Appropriate action

London Evening Standard, Oct. 23, 2013
School's out for... fumigation: poisonous 'false widow' spider infestation closes academy

Spiders discovered in computer technology block at the academy

Ghastly consequences

As more spiders were discovered elsewhere in the school, the academy was closed.

"We have taken advice from the health and safety unit at Gloucestershire Local Authority and C&D Pest Control, Chepstow, and have taken the decision to close the academy all day on October 23.

"This will enable pest control to fumigate every area in the academy and ensure everyone's health and safety.

Panic pest
#6 scorpions and scorpion-like creatures

Ghastly consequences

- Pesticides sprayed every week for years and years and years!!

Appropriate action

- Pest-proof buildings
- Habitat modification
- Education

Panic pest
#7 *Aedes* and *Culex* Mosquitoes

Ghastly consequences

- Athletics and event disruption
- West Nile Virus, dengue fever, chikungunya

School Playing Field

- Thousands from 1 gallon of water
- ¼ inch of water is enough

Appropriate action

- Water management
- Report problems to Vector Control
- Sensible use of insect repellents
- Education
- Treatment of water drainage areas

Panic pest
#8 *Blattella germanica*
German cockroach

- Allergies and asthma - 8 units allergen (1 female = 1500 units per day)
- Cockroaches go home

Ghastly consequences

Ghastly consequences

home » latest news » roaches in food prompts ...

published Wednesday, May 21st, 2014

Roaches in food prompts closure of GA high school cafeteria

by Associated Press
view bio »

font size print email share

CEDARTOWN, Ga. — Students at a northwest Georgia high school will be eating prepackaged lunches for the rest of the year after roaches were found in meals being served in the cafeteria.

- School cafeteria closures
- School closures

Appropriate action

- Improve sanitation standards
- Monitor
- Bait (rotating baits) where nymphs are found in monitoring traps
- Report deliveries arriving with cockroaches

Panic pest #9 rodents

Ghastly consequences

- Allergies and asthma
- School closures
- Students eating rodent bait

Tampa Bay Times, March 26, 2013
Rats cause Plant City High kitchen to close

Hillsborough schools officials say the school's kitchen was shut this week so a pest control company could deal with the scurrying creatures.

Steve Hegarty, a district spokesman, said he wasn't sure about the problem's extent or when exactly it surfaced, but according to a Plant City High student, rats have been running around for years.

Ghastly consequences

Appropriate action

- Pest-proofing buildings
- Inside: snap-traps in locked boxes
- Reduce clutter (if necessary)
- Improve sanitation
- Improve waste management practices

Panic pest
#10 *Apis mellifera*
Honey bees

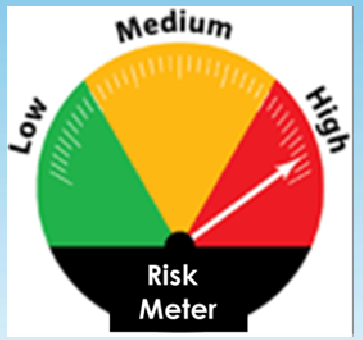
Killer bees attack Diamond Secondary School

JUNE 1, 2013 | BY **KNEWS** | FILED UNDER **NEWS**

Pandemonium broke out at the Diamond Secondary School yesterday, after a swarm of killer bees invaded the school compound.
The bees were reportedly hovering over the area, close to the Head teacher's office located on the northern entrance of the School compound.

Concerned parents and residents of the community contacted Kaieteur News, as students and teachers fled the vicinity. "Come quickly bees attacking the secondary school!" one resident exclaimed. Lesmeine Collins, the Principal, said that while the attack forced the removal of the students and teachers for a brief period, it did not interfere with the students, sitting Caribbean Secondary Examinations Council (CSEC) at the southern end of the complex.

Diamond Secondary School compound



Ghastly consequences

- Hypersensitivity response to sting
- Death

Africanized bees reach Colorado, turn up in Palisade orchard

By Nancy Lofholm
The Denver Post

POSTED: 05/13/2014 02:53:57 PM MDT | UPDATED: 6 MONTHS AGO 11 COMMENTS

GRAND JUNCTION — Colorado's first confirmed Africanized honeybees have turned up in a Palisade orchard, stunning entomologists who didn't believe the bees could survive cold Colorado winters.

The bees, which are much more aggressive than common honeybees, were discovered by an orchard owner who recently was attacked and stung while working on his hives wearing his normal protective gear.

A single bee from the aggressive hive was confirmed to be an Africanized honeybee through genetic testing at Colorado State University. The hive has been destroyed.

"I was stunned by the results of the test. They survived what we considered to be a pretty brutal winter," said Bob Hammon, a CSU extension agent and entomologist in Grand Junction.

"We don't understand the significance of that yet."

Africanized honeybees first turned up in the United States (in Texas) in 1990 after they were introduced into Brazil from Africa.

The bees prefer tropical climates, and it was believed they couldn't survive in areas with extended winters because they need steady sources of nectar and pollen.

But the bees have slowly been migrating north. The closest they are known to have come to Colorado previously was southern Utah. They have existed there for six or seven years.

May 2014

- DO NOT FLAP!!!!!!!!!!!!
- Cover face and head with clothing or hands
- **Run into a home or shelter**
- Do not dive into a pool
- If out in the open run at least the length of two football fields

Appropriate action

- Know bees and the risk
- "Caution tape" area
- **Call the experts**

(who have the right equipment to do the job safely)

Panic pest
#11 *Bats*

Ghastly consequences

- School evacuation
- Rabies exposure
- Cost

Dead Bat At Montana County School Prompts Rabies Shots For 90 Elementary School Children

- Mother (professional nurse) found a dead bat in cat's mouth
- Brought the bat to school and gave presentations on the bat in five classrooms, allowing students to touch the bat
- Some kids put their fingers in the bat's mouth
- Stopped by a soccer field to show the bat to people
- 110 people exposed

Montana County School

- The school sent out notices to parents (due to school nurse).
- Bat tested positive for rabies
- Stevensville School officials used liability insurance to pay for the rabies shots ($70,000 out of $150,000)
- Later the insurance company agreed to cover additional costs and assume responsibility if law suits are filed by parents

Montana County School

- The health department recommended treatment for 105 people of the 110 exposed
- 74 were vaccinated and 31 declined
- Two more children were exposed outside the school, both declined shots
- After the incident, school officials instituted a policy of requiring all visitors to the school to have a visitor pass

Panic OTC pesticide use

Ghastly consequences

POLICY STATEMENT: Pesticide Exposure in Children

PEDIATRICS Volume 130, Number 6, December 2012 (33 referenced papers)

- Policies that promote integrated pest management, comprehensive pesticide labeling, and marketing practices that incorporate child health considerations will enhance safe use.
- Integrated pest management (IPM) is an established but under supported approach to pest control designed to minimize and, in some cases, replace the use of pesticide chemicals while achieving acceptable control of pest populations.
- Pediatricians can play a role in promotion of development of model programs and practices in the communities and schools of their patients.

The Best Way to Protect our School Community from these Risks is by Implementing IPM

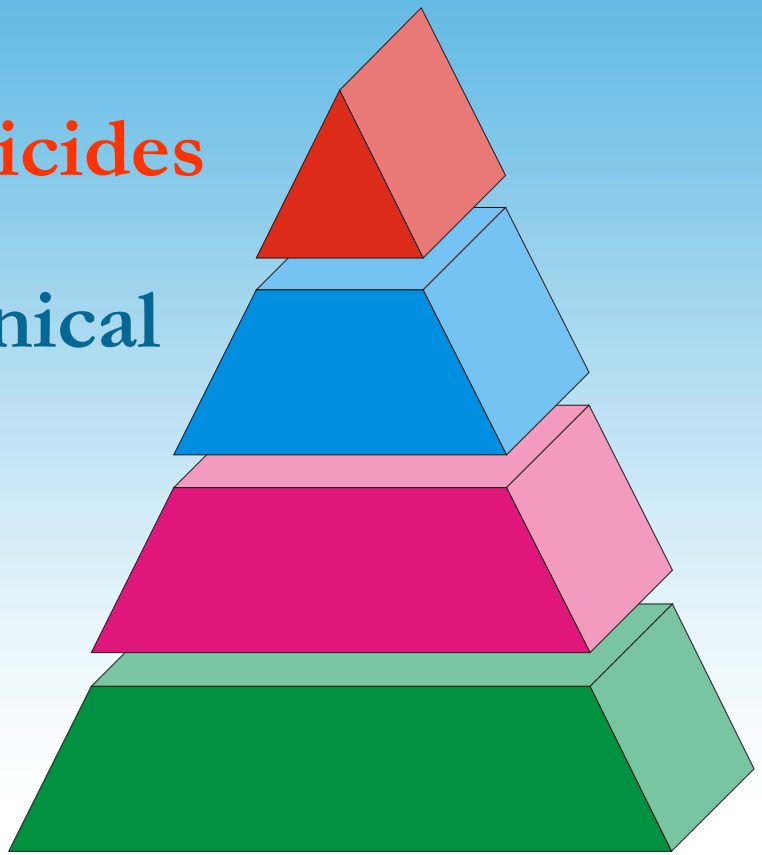
Integrated Pest Management

Pesticides

Physical/mechanical control

Cultural/sanitation practices

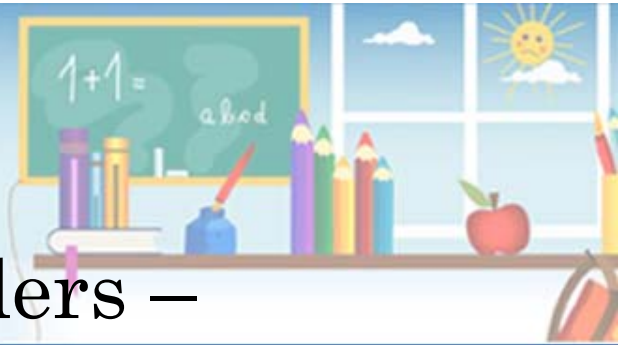
Education & Communication



PVAs pest vulnerable areas

- Kitchens and food storage areas
- Teachers lounge
- Dumpster area/recycling area
- Special education classrooms
- Locker areas
- Sports coach offices and changing rooms
- Lost and found
- Custodial closets
- Child care center / dormitories
- Concession stands/PTO storage

Common School Pests



- Mice
- Various ant species
- German and American cockroaches
- Head lice
- Venomous arthropods – ants, wasps, scorpions, spiders
- Stored product pests
- Invaders – sowbugs, millipedes, ground beetles
- Bed bugs
- Feral cats
- Fleas
- Mosquitoes
- Occasional infections e.g. Scabies, ringworm

Have a policy for each pest

- Response plan
- Thresholds
- Management protocols
- Communication protocols

Do something different

SUPPLY-SIDE IPM supplying practitioners of IPM with:

- Training to manage pests via integrating strategies – Extension/State
- Materials for monitoring and treatment of pests – job
- Time to educate consumer – industry - job

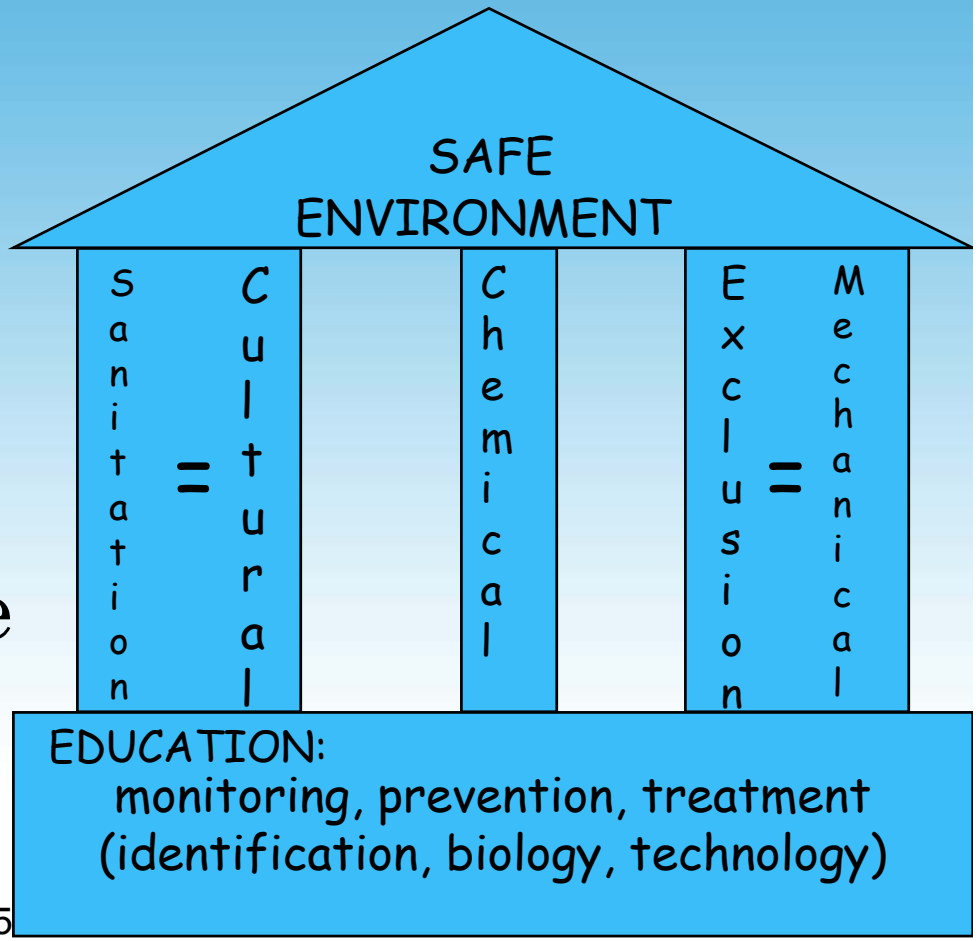
PROBLEMS? Trained vs. route tech, & Time…. And no "people mgt"

Problems of improper training, no time, and no ability to partner

- No monitoring stations in PVAs
- No compatible hours with staff
- Excess pesticide use e.g. 143 applications for 3 schools in one year
- No ID e.g. “red ants” or “sugar ants”
- Poor knowledge e.g. mice do not have bones
- No communication about OTC pesticides
- Not interviewing faculty and staff
- Saying IPM costs more….

Demand-side IPM

Fact: the vast majority of pest management is achieved by food service, custodial, administrative and building maintenance professionals….
NOT pesticide applicators



Implementers must demonstrate IPM is compatible with the district's current operations

- Doing what you do now---just think pests!!!
  - Security = monitoring
  - Energy conservation = exclusion
  - Sanitation = nothing to eat
  - Clutter control = no place to live

Food Water Shelter

Three "adopting" audiences

1. Funders & Political supporters (EPA, USDA…)
2. Traditional Change Agent Community - Extension
3. The School Community

Your Partners for Implementation

- Superintendent
- Facility manager
- Principal
- Teacher
- Head custodian
- Athletic director
- Nurse
- Food service
- Fire Marshal

The Best Way To Protect Our School Community From These Risks Is By Implementing IPM

But, they Gotta want it more than we do!

Pest Control In The School Environment: Adopting Integrated Pest Management – 1992(3)

Ralph Wright & Bill Currie
EPA 735-F-93-012 (controversial)

Information For School Districts

Over 19 Years, 18 States and 7 EPA Regions:

- 71% Reduction in pesticide applications
- 78% Reduction in pest complaints

Reasons For Successful SIPM Implementation

- Administrative commitment based on "it's the right thing to do"
- Designated authority to IPM coordinator
- Empower the school community through education
- Technical confidence provided by training AND outreach resources
- Confirmation to the community that right decision was made ($$, pests, risk reduction)
- More confirmation through recognition (PR/awards)

Reasons for failed Implementation

- "Uneducated" mandates (more on their plates – money, logic, motivation)
- Not understanding the technical situation
- Not understanding the economic situation
- Over reliance on written material
- Too much paper work
- Those (internal or external) responsible for changing behavior have no authority
- ….educational competence
- ….Motivation

8 Tools Change Agents Should Use For Sustaining School IPM Programs:

1. A message of Demand Side IPM
2. Environmental Health & Safety Committees (EHS)
3. Pest Presses
4. PMP Partner with job specs
5. Area-wide Coalitions
6. Recognition Program
7. Willingness to GET DIRTY!
8. Non-pesticide-centric Legislation

Dr. Marc Lame,
Indiana University

Reasons for Environmental Health & Safety Committees (EHS)

Are to utilize the experience, expertise and influence of leaders in your school community to provide advice, political support and continuity to the corporation's environmental program staff.

The Pest Press – Best If Hard Copy – They Have To Search For It!

- Over time defines IPM and what it means to the school community
- Addresses the pest of the month, why it is attracted to our school, how to prevent it from infesting our school, and control upon infestation
- The status of your IPM program,
- Recognize folks that are helping make it work and
- Short “bug facts” on simple biology insects in general
- The key to this newsletter seems to be that whatever information on pest management is given, it relates to what is going on in the readers home.

PMP Partner With Job Specs

Partner: an entity who wants to work with you to reach SHARED goals

Accountability

- Shared responsibility
- QA/QC
- Communication required

Co-production

- Resource leverage
- Empowerment
- Partnership
- Leadership

What is the cost of what you are getting? Time - by the minute (sq. ft. bids are not appropriate in schools)

- Elementary School average = 30-45 min/month
- Middle School average = 45-60 min/month
- High School average = 60-120 min/month

Schools must be informed such that they DEMAND the Pest Management Professional be a:

"Diagnostician/ educator"

Where do we go from here?

School MUST Partner with a PMP!

- **No** scheduled pesticide sprays

- Inspect and monitor
- Restrict the pesticides allowed
- Inform parents
- Designate an IPM specialist

- Train staff and teachers
- Only certified applicators should apply chemicals

- **Communicate, communicate, communicate!**

Justified Applications

- Treat every pesticide like it might be banned…be precautious!
- Timing and placement based on children and target pest

Area-wide Coalitions
– Two step flowing

Recognition Programs - To Confirm To The Adopting Unit That They Made The Right Decision – Reaching Critical Mass!

WILLINGNESS TO GET DIRTY – Credible Hand Holding!

Non-pesticide-centric Legislation

- Rules that address conducive conditions
- Regulated by Health Departments?

Pest perception!

RESULT - A safe learning environment

Resources

- http://www.colostate.edu/Dept/CoopExt/4DMG/Pests/pests.htm#Insect Pests in the Home
- http://www.ext.colostate.edu/pubs/insect/05512.html
- http://www.colostate.edu/Dept/CoopExt/4DMG/Pests/whatis.htm
- http://www.colostate.edu/Dept/CoopExt/4DMG/Pests/pests.htm