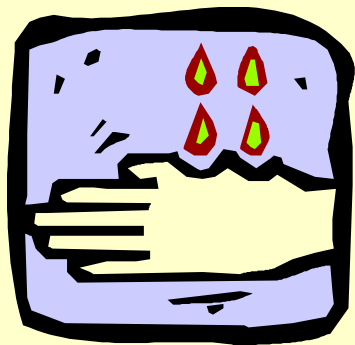


Pesticides and Human Health



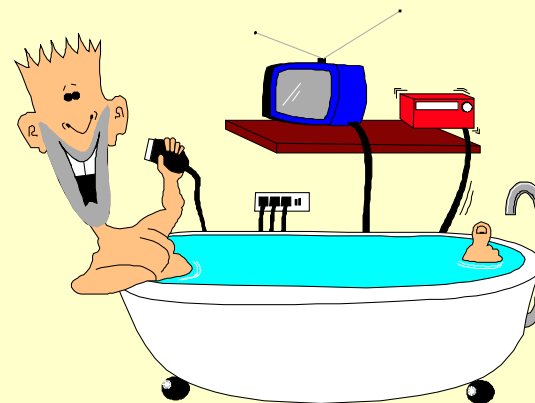
Chapter 6
Pesticide Applicator Core
Training Manual

HAZARD = EXPOSURE x TOXICITY



Exposure - how pesticides enter the body

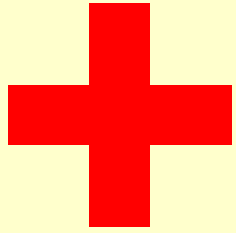
Toxicity - how poisonous the pesticide is



4 Methods of Exposure

- Dermal (skin)
- Oral (mouth)
- Inhalation (lungs)
- Eyes

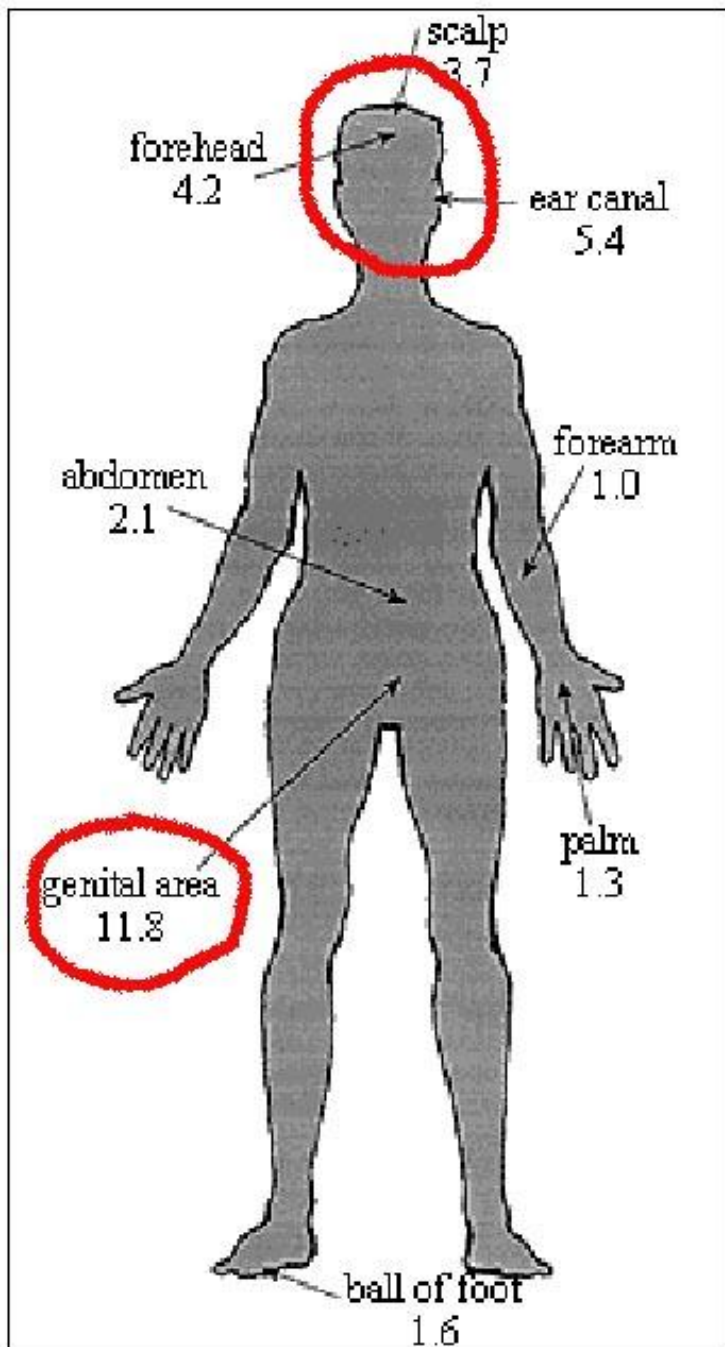




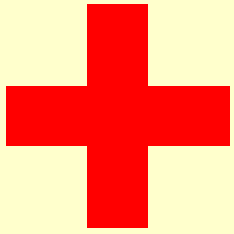
Dermal exposure

- rinse with water
- remove contaminated clothing
- wash with plenty of soap and water





- Parts of the body absorb pesticides at different rates.
- The head is 4 times more absorbent than the hand
- and the genital area is 11 times more absorbent.



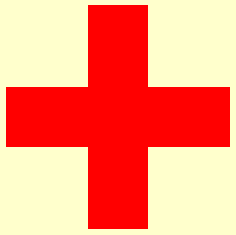
Oral Exposure

- rinse mouth with water
- Do not induce vomiting if
 - victim is unconscious
 - having convulsions
 - petroleum based product
 - corrosive pesticide
 - label specifies NOT to induce vomiting



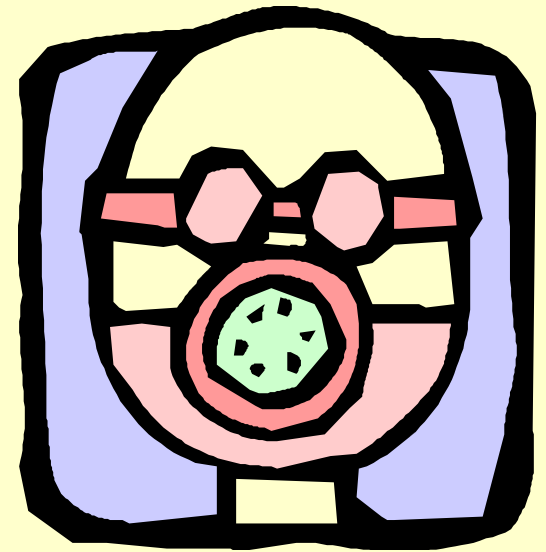
Pesticides removed from their original containers are the highest cause of pesticide poisonings in adults and children.

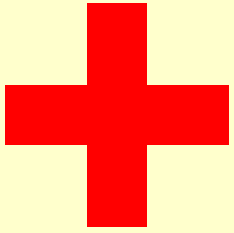




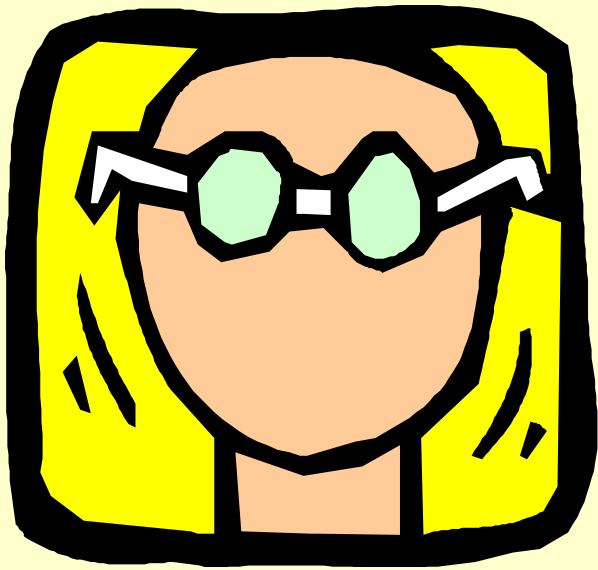
Inhalation Exposure

- remove to fresh air
- loosen tight clothing
- keep air passages clear
- perform artificial respiration if necessary





Eye exposure



- wash eye with a gentle stream of clean water for 15+ minutes
- get medical attention if there is pain or reddening of the eye

First Aid



- Act immediately!
- Stop exposure
- Rinse with clean water
- Read and follow label directions!
- See a doctor and bring the pesticide label.

HAZARD = EXPOSURE x TOXICITY

Toxicity = the pesticide's ability to cause damage

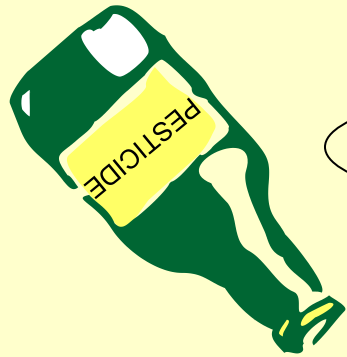
SIGNAL WORD

Acute Toxicity



- immediate harm caused by pesticide exposure (within 24 hours)
- signal words measure acute toxicity for skin, mouth, lung and eye exposure

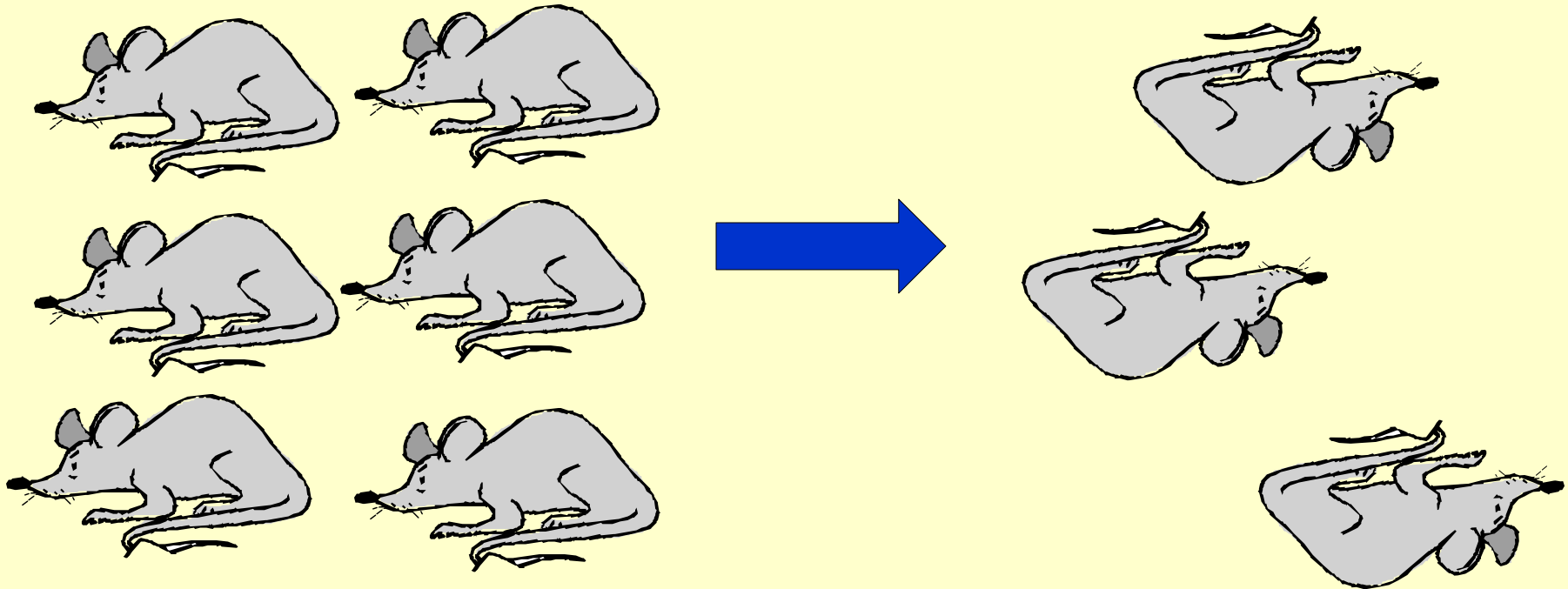
Acute Toxicity is measured in



LD_{50} and LC_{50}

lethal dose

lethal concentration

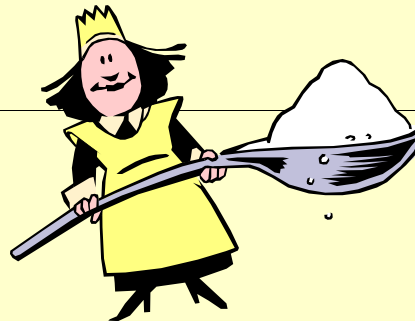


What this means

higher LD_{50}/LC_{50} = less toxic



lower LD_{50}/LC_{50} = more toxic



Toxicity - 4 Categories



TOXICITY CATEGORY	ORAL LD₅₀ (mg/kg)	SIGNAL WORD	APPROX. ADULT LETHAL DOSE (ORAL)
I	0-50	DANGER/ POISON	Few drops to 1 teaspoon
II	50-500	WARNING	1 teaspoon to 1 ounce
III	500-5,000	CAUTION	1 ounce to 1 pint or pound
IV	>5,000	CAUTION	More than 1 pint or pound

Putting it all together.....

**High Acute
Toxicity**

- = Category I
- = DANGER/POISON
- = low LD_{50}/LC_{50}
- = small amount of pesticide can kill or harm you

Acute Toxicity - symptoms

- Dermal - skin irritation, reddening, itching
- Oral - nausea, muscle twitching, sweating, weakness
- Inhalation - burning of throat and lungs, coughing
- Eye - temporary or permanent irritation or blindness



Chronic Toxicity



- delayed - time lapse between exposure and effects (don't appear immediately)
- result of repeated exposure to same pesticide or one with similar mode of action
- or from a single exposure
- effects are not seen until much later

Chronic toxicity can cause

- cancer
- tumors
- birth defects
- infertility or sterility
- impotence
- blood disorders (anemia, inability to clot)
- brain damage
- paralysis
- emphysema, asthma
- kidney problems



REMEMBER:

Low-level exposure to chemicals that have potential to cause long-term effects may not cause immediate injury, but repeated exposures can greatly increase the risk of chronic adverse effects.

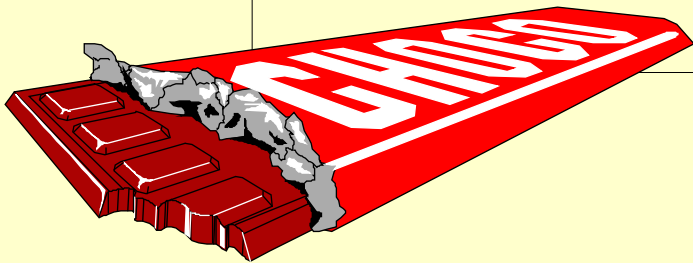


Allergens

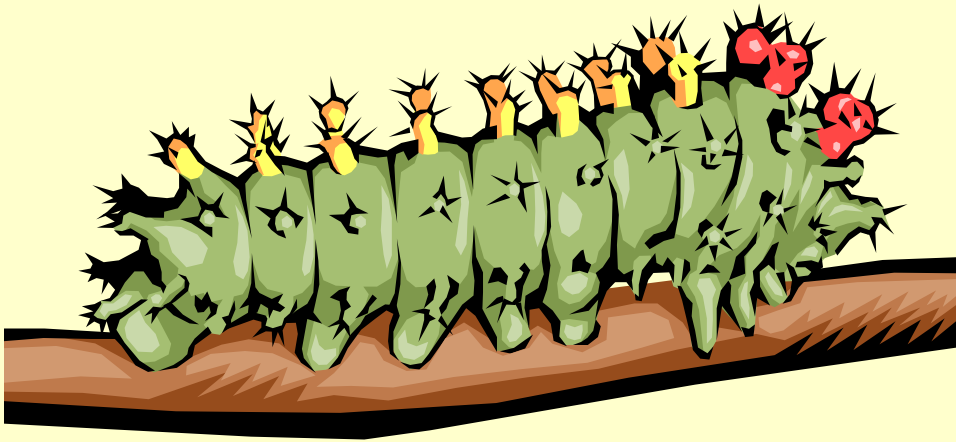
- anything that causes allergies
- need more than 1 exposure to product
- after the 1st exposure the body develops a negative response
- when exposed again, the body responds negatively = **allergic reaction**

Allergies can cause

- trigger an asthma attack
- shock
- rashes, blisters, contact dermatitis
- itchy, watery eyes
- sneezing



Why are some pesticides a health risk?

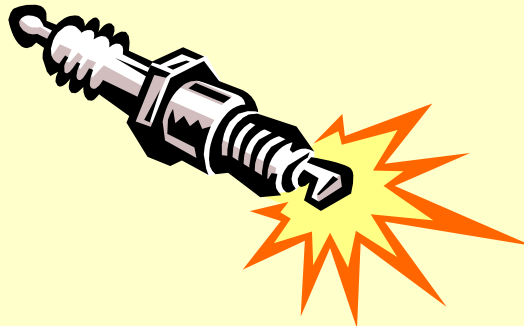


The nervous system of insects and humans have some common characteristics.



Nervous System

- Nerves communicate with electrical signals.
- Special proteins called “transmitters” carry the electrical signal across the gap between 2 nerves.
- Other proteins called enzymes, clean out the gap so the nerve is ready for the next signal
- Insects and humans have some of the same transmitters and enzymes.



Organophosphates (OP)

- widespread use and high toxicity
- interferes with an important nervous system enzyme, cholinesterase
- nerves continuously send messages to the muscles
- causing twitching, convulsions, seizures and death

Organophosphates (OP)

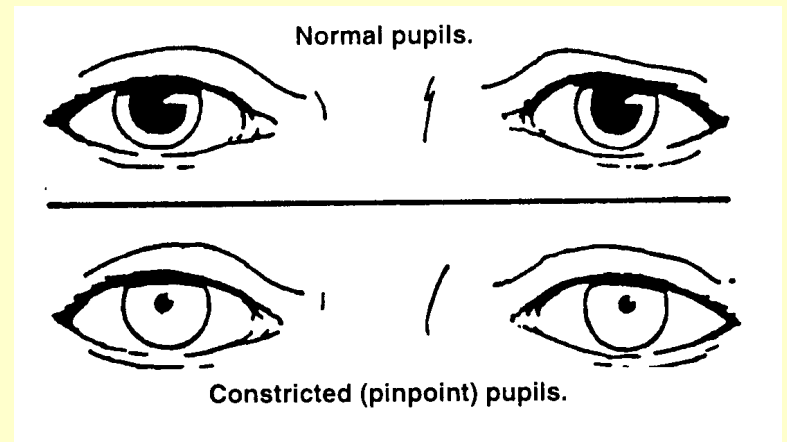
- Large exposures can cause acute poisoning.
- Small exposures over time “add up” in the body leading to poisoning.

Carbamates

- also interferes with cholinesterase
- broken down by the body
- acute poisoning

Symptoms of OP and Carbamate poisoning

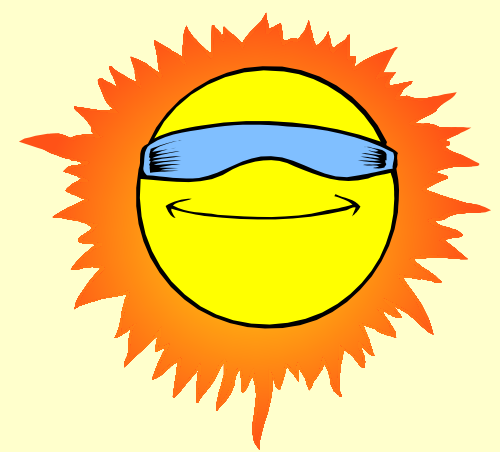
- Mild - headache, fatigue, dizziness
- Moderate - muscle twitching, unable to walk, pinpoint pupils
- Severe - unconscious, seizures, death



Cholinesterase Test Program

- Consult your doctor.
- off season base line test (January or February)
- periodic testing during the season
- monitor changes in cholinesterase levels





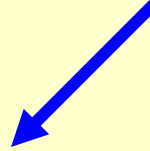
The signs and symptoms of a pesticide poisoning are similar to

Heat Stress

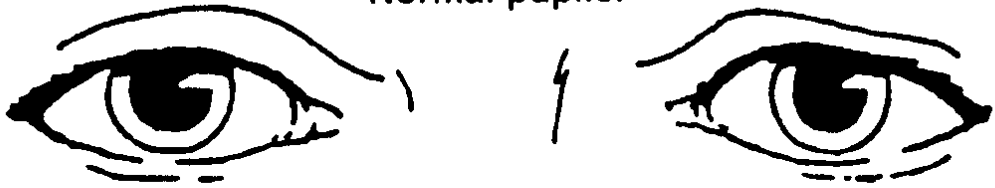
Heat Stress symptoms

- exhaustion, headache, nausea, chills, dizzy
- thirsty and dry mouth
- clammy skin or hot, dry skin
- heavy sweating or not sweating
- confused, slurred speech, irrational
- death

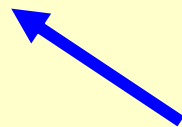
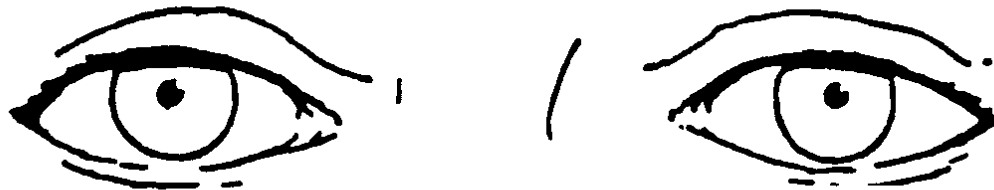
Pupils of a heat stress victim are normal.



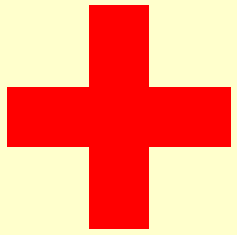
Normal pupils.



Constricted (pinpoint) pupils.

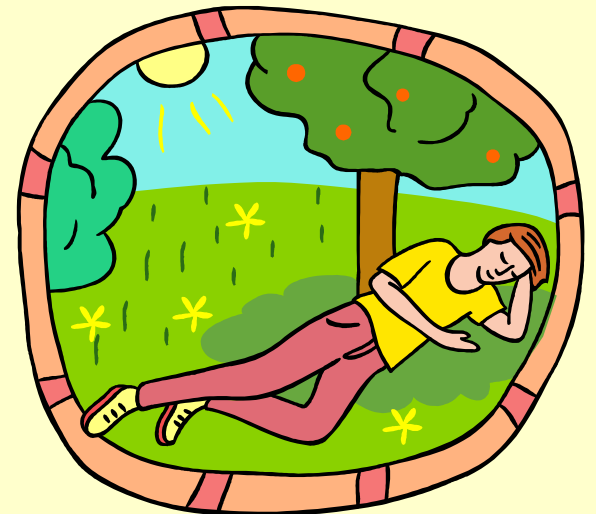


Pupils of an OP pesticide poisoning victim are pinpoint.



Heat Stress

- move to shade
- rapidly cool victim - splash or sponge cool water on skin
- drink as much water as possible
- stay calm and call for help



HAZARD = EXPOSURE x TOXICITY

The best way to avoid a pesticide poisoning is to protect yourself by reading the label and wearing personal protective equipment.

