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APES Topic 9 - Toxicology

Date _____
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AIM: How are chemicals regulated and what are some alternative methods used for pest control?

Regulatory Laws / Initiatives

(overseen by the EPA, FDA, and USDA)

1. **Federal Food, Drug and Cosmetic Act of 1938** (abbreviations vary - FFDCA, FDCA, or FD&C)

- a. clear product labeling required on all foods, drugs, and cosmetic products
- b. set maximum limits of pesticide residues on food items
- c. 1959 - Delaney Clause – prohibits the use of carcinogens in food

2. **Federal Insecticide, Fungicide, & Rodenticide Act of 1947 (FIFRA)**

- a. governs the registration, distribution, sale, and use of pesticides
- b. registrant must prove the pesticide to be safe before it can be registered and put into use

3. **Food Quality Protection Act of 1996 (FQPA)**

- a. updated “reasonable certainty of no harm” safety standard in foods
- b. main focus was on risks to infants / small children
- c. required the screening of pesticides for endocrine disruption

4. **Stockholm Convention (signed 2001, in effect 2004)**

- a. treaty signed that eliminates/restricts the production and use of persistent organic pollutants (POPs).
- b. included 12 specific chemicals – EPA’s “Dirty Dozen” including DDT and PCBs (10 others were later added to list)
- c. U.S. signed, but did not ratify – means that we follow it in “spirit”, but still allow companies to manufacture and sell certain chemicals on list overseas

Alternative Pest Control Methods

1. Agricultural Practices

- switching from monoculture to polyculture (less pest problems with polyculture)
- crop rotation – if possible, keep moving crops away from where pests are found on property
- plant “trap crops” to lure pests to something more enticing than main crop (ex. sunflowers to lure pests away from tomatoes)

2. Biological Controls

- use predators / parasites to control pest populations (ladybugs, parasitic wasps)
- dogs / fake dog cutouts to deter geese
- cats for mice
- bat boxes from mosquitoes
- scarecrows for crows near corn

3. Physical Controls

- physical barriers / techniques to reduce or remove pests
- non-toxic traps (bug zappers)
- ultrasound repellers for rodents
- food irradiation for bacteria, viruses, and other pathogens
- “Aqua Heat” – how water sprays that are hot enough to remove pests, but that does not damage crops

4. Natural Chemical Controls

- companion planting
 - “mums” – many insects (ticks, ants, fleas)
 - marigolds - nematodes
 - herbs/citronella/lemon balm – mosquitoes
- pheromone (sex attractant) sprays to lure pests into traps
- dog hair / animal urine

5. Integrated Pest Management (IPM)

A carefully planned MIX of biological, natural chemical, and physical methods used at the same time in lieu of using pesticides