

Health Effects of Pesticides

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Session Objectives

- List the most commonly used categories of pesticides
- Understand potential sources of pesticides exposure and how to avoid them
- Understand the difference between acute and chronic health effects
- Identify potential acute and chronic health effects of some of the most commonly used pesticides

Definition - pesticide

- Any chemical intended to kill unwanted organisms, including:
 - insecticides,
 - herbicides (weed killers),
 - fungicides,
 - rodenticides

Where are pesticides used?

- agriculture, homes, schools, golf courses, public parks, play grounds, sports fields, landscaping, along highway and utility line corridors, lakes, ponds, along railways, hospitals, shopping centers, stores, ships, trains, and airplanes, incorporated into some building materials, head lice shampoo, flea and tick shampoos for dogs

Quantity of Pesticides in the U.S.

- Over 800 registered active ingredients.
 - Used to create thousands of products
 - For example, carbaryl (an insecticide) is in 4,365 products
- Approximately 1.2 billion pounds of pesticide active ingredients used in the U.S per year.

Expenditures on pesticides

- 2001 in the U.S. in \$ billions

	herbicide	insecticide	other	total
Agriculture	\$5.0	\$1.3	\$1.1	\$7.4 billion
Industry & Gov.	\$0.8	\$0.5	\$0.2	\$1.5 billion
Home & garden	\$0.6	\$1.3	\$0.2	\$2.2 billion

Most heavily used pesticides in US (2001 data)

Agriculture	Non-Agriculture
Glyphosate	2,4-D
Atrazine	Glyphosate
Metam Sodium	Pendimethalin
Acetochlor	Diazinon (banned 2004)
2,4-D	MCPP
Malathion	Carbaryl
Methyl Bromide	Dicamba
Dichloropropene	Malathion
Metolachlor	DCPA
Pendimethalin	Benefin

Commonly Used Insecticides

Chemical category	Example	Commercial products
Carbamate	Carbaryl	Sevin, Purina Dog and House Spray
Organophosphate	Malathion	101 mosquito fog
Pyrethroid	Phenothrin	Black Flag Room Fogger, Raid House & Garden Bug Spray, dog shampoos
Pyrethroid	Permethrin	Nix headlice shampoo

Commonly Used Herbicides

Chemical category	Examples	Commercial products
Chlorophenoxy herbicides	2,4-D, MCPP	Weed-B-Gon, Ace Supergreen Winterizer, Scott's Turf Builder
Phosphonoglycine	Glyphosate	Round Up, Ortho Grass & Weed Killer
Dinitroaniline	Pendimethalin	Prowl, Chemlawn, Turfgo,
Triazines	Atrazine	Turf Pride, Purge, Sta-Green
Benzoic acid	Dicamba	Banvel, Oracle, Vanquish

Do pesticides get into people?

- NHANES
 - Blood and urine samples
 - Multiple pesticides
 - “Widespread use of the contemporary pesticides for agriculture and residential applications makes it virtually impossible for the average person to completely avoid exposure.” (NHANES 2003-04: Urinary Current Use Pesticides)
- Many other studies

Routes of exposure

- Ingestion
 - Conventionally grown foods
 - Contaminated water
- Inhalation
 - During application
 - Pesticide drift
- Absorption through skin
 - During application
 - Residue left on surfaces
 - Clothing

Avoiding Pesticide Exposure

- Organically grown foods
- Filtered water
- Integrated Pest Management
- Tolerate a few weeds
- Use pesticides only as a last resort

Integrated Pest Management

- IPM is pest prevention.
- Deny pests access to food, water, and shelter:
 - Clean up crumbs and spills.
 - Put food away in tightly sealed containers.
 - Empty the garbage daily.
 - Don't leave dirty dishes out.
 - Don't leave pet food out.
 - If you recycle, rinse items before they go in the recycling bin
 - Weatherstrip and caulk points of potential access.

www.epa.gov/pesticides/factsheets/ipm.htm

www.ipminstitute.org/

Avoiding Pesticide Exposure

- Consider chemical free alternatives.
 - www.beyondpesticides.org/alternatives/factsheets/index.htm
- Use least toxic method.
- If the pest isn't present, don't use pesticides.
- If you are going to use a pesticide, use only according to the label.
- Store out of reach of children in the original, labeled packaging.

Avoiding Pesticide Exposure

- In particular insecticide sprays, foggers, and ‘bug bombs’ should be avoided.
 - They cause the highest exposures of humans and pets.
 - They are untargeted, like trying to hit a golf ball using a shot gun.

Pesticide Info & Pest Control Advice

- www.pesticideinfo.org
- www.beyondpesticides.org/alternatives/factsheets/index.htm
- <http://extoxnet.orst.edu/pips/ghindex.html>