Review of Field and Pesticide Safety Issues

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Fundamental Concepts

- Be proactive
- The Buddy System
- Err on the side of caution
- Communicate health issues
- Know where to get help
Quick To Do List

• Wear your seat belt
• Don’t talk on the phone or text while driving
• Wear protective gear
• If transporting chemicals – keep in secondary container and separate from food and water
• If working in cold be sure to stay dry
• If working in heat be sure to stay hydrated
Chemical Exposure
Effects of Selected Fertilizers and Soil Conditioners

- Fertilizers – organic (manure) and inorganic (anhydrous ammonia)
  - Manure: minor - sanitary issues
  - Anhydrous ammonia: depends on exposure – ranges from minor irritation nose and throat to freeze burns on contact

- Soil conditioners such as Lime and gypsum
  - Lime: can cause eye damage, burns on skin, irritating to inhale – dusk masks
  - Gypsum: minor irritant, drying
What Are Pesticides?

- Abbreviated FAO definition: “Any substance or mixture of substances intended for preventing, destroying or controlling any pest…..”

- Typically targeted towards a specific type of pest
  - Herbicides, Insecticides, Rodenticide, Fungicides, etc

- Pesticides occur in different forms – dust, pellets, liquid sprays, gases
  - Agriculture – liquid spray – applied tractor or airplane
  - Potentially be incorporated into soil

- Application methods means that exposure to pesticides can occur via
  - contact with crops and noncrop plants adjacent to fields
  - Contact with soil and water
  - Air
What Types of Pesticides Occur?

- Upper Big Walnut Creek
  - Documented all 15 within sampling sites within Upper Big Walnut Creek
  - Herbicides – acetochlor, alachlor, atrazine, atrazine desethyl, dithiopyr, metolachlor, simazine, 2,4-D, (glyphosate – previous years)
  - Fungicides – azoxystrobin, chlorothalonil, metalaxyl, myclobutanil, triadimefon, vinclozolin
  - Insecticides – Malathion
- WRSIS wetlands and reservoirs
  - Documented six pesticides – limited sampling 2008 and 2009
  - Herbicides – atrazine, atrazine desethyl, metolachlor, simazine
  - Fungicides – chlorothalonil, metalaxyl
- Most likely partial list as this is only those that we measure from water samples
Relative hazards of different pesticides

- Pesticide labels contain keyword that conveys relative degree of hazards of the pesticides for people
  - Labels also contains information on first aid, restricted entry interval, and protective equipment needed
<table>
<thead>
<tr>
<th>CAUTION</th>
<th>WARNING</th>
<th>DANGER</th>
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</thead>
<tbody>
<tr>
<td>Atrazine (Aatrex 4L)</td>
<td>Acetochlor (Acetochlor EC)</td>
<td>Chlorothalonil (Bravo Ultrex)</td>
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<tr>
<td>Glyphosate (Traxion)</td>
<td>Metalaxyl (Dyna-shield)</td>
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<tr>
<td>Simazine (Princep Caliber 90)</td>
<td>Malathion (Gowan malathion 8)</td>
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<tr>
<td>S-metolachlor (Medal II EC)</td>
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<tr>
<td>Atrazine-metolachlor-glyphosate (Expert)</td>
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<td>Azoxystrobin (Quadris)</td>
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<td>Tefluthrin (Force 3G)</td>
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<td>Vinclozin (Ronilan EG)</td>
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12 pesticides – most measured SDRU lab except Tefluthrin and glyphosate
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After application – different pesticides have different REI times – this is time that workers are allowed back in treated areas after application.
Effects of Pesticides

• Death as result occupation exposure is rare
  – Nearly all pesticide deaths caused by eating or drinking pesticides

• Short term – immediate effects
  – Herbicides and fungicides
    • skin irritation - redness, itching, rashes, burns, blisters
    • stinging, swelling eyes
    • nose, mouth throat irritation
  – Insecticides
    • nausea, vomiting, diarrhea, headache, dizziness, weakness, excessive sweating, tearing, chills, thirst, chest pain, breathing difficulty, body aches, cramps

• Potential long term effects low exposure
  – Birth defects, tumors, genetic changes, blood disorders, nerve disorders, reproductive effects, damage to immune system
Pesticide Sensitization

- Repeated exposure can cause sensitization in some
  - Similar to poison ivy exposure
  - First few times exposed – little or no reaction
  - Continued exposure results in reactions increasing in severity
Routes of Pesticide Entry into Body

- **Skin**
  - 90% of exposures *users* receive is dermal
  - majority of pesticide poisoning and injuries occur via skin exposure
- **Eyes**
- **Nose and Mouth**
  - Drift and exposure to vapors prior to restricted entry interval
  - transfer residues to mouth if eat, drink, smoke, or chew gum without washing hands
Pesticide Absorption Rates

Relative absorption rates, as compared to the forearm (1.0)
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How Reduce Pesticide Entry in Body

- Avoid exposure
  - If spraying in field working – leave
  - If spraying in field adjacent to working – leave
  - Avoid entering fields that have been treated
  - Wear clothing that covers your skin
  - Wash hands before drinking, eating, smoking, chewing gum, or using toilet
  - After work shower with soap and water
  - Wash work clothes separately from other clothes
Signs and Symptoms of Common Types of Pesticide Poisonings

• Common injuries
  – Skin and eye irritation
  – Nose and throat pain
  – Skin rashes

• Common poisoning symptoms:
  – Dizziness, headache, muscle aches, cramps, tiredness, nausea, diarrhea

• More serious poisoning can cause
  – Chest pain, breathing difficulties, excessive salivation, very small pupils, lack muscle control, convulsions, unconsciousness, death

• Not all pesticides cause same symptoms and not all people will have all symptoms
  – Some symptoms are similar to that associated with cold, flu, heat stress, etc.
Emergency First Aid

• Skin exposure
  – Remove pest contaminated clothing immediately
  – Wash skin clean water and soap

• Eye exposure
  – Rinse with eye flush kit

• Oral exposure
  – get to medical facility as soon as possible
    • Need to know where nearest medical facilities are
  – follow first aid instructions on pesticide label

• Respiratory exposure
  – wear proper respiratory protection
  – remove to fresh air, loosen clothing to help breath
  – Perform CPR if trained and needed
Special Considerations – Crop Dusters

- Fast moving
- Can appear quickly
- Be vigilant – if look for signs of potential activity
- Listen for airplanes and watch
- Pilots will not stop spraying to let you leave
• Potential Pattern of Application
Additional Information....

- Additional training needs for those who handle, apply, load, or work with pesticides
- Under no conditions is anyone to take pesticides from work home with them
- Pesticide containers are never safe for alternative uses even after empty
  - Do not reuse containers, but instead dispose of them properly
- Illegal to pour pesticides into any other type of container
Summary

• Be **PRO-ACTIVE** with respect to your safety.

• The **BUDDY SYSTEM** is the BEST! Work together and watch out for each other.

• Err on the side of caution. Your safety is more important than the data.
Questions???