

# Agrochemical Poisoning

Wes Larson, BAS, FP-C



# Poisons on the

# Farm

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# Objectives

- Define chemicals and their uses
- Review similarities/differences
- What is a material safety data sheet (MSDS)??
- Decontamination suggestions
- Treatment/Transport decisions



# ag·ro·chem·i·cal / agrō'keməkəl/ *noun* 1.a chemical used in agriculture, such as a pesticide or a fertilizer.

### Pesticides

- Herbicides
- Rodenticides
- Fungicides
- Nematicides
- Insecticides

### Others

- Soil conditioners
- Fertilizers
- Fuels









HOMETOWNSTAT



# Driver flown to hospital after Dane Co. crash with farm sprayer

Two children in the back seat weren't hurt.



#### LOCAL NEWS

### Traffic accident in Wisconsin leads to anhydrous ammonia leak, residents evacuated

by: <u>Devin Willems</u> Posted: Apr 24, 2023 / 05:28 PM CDT Updated: Apr 24, 2023 / 05:28 PM CDT



Traffic accident in Wisconsin leads to anhydrous ammonia leak, residents evacuated



# SAFETY FIRST!!!

Scene safety

- Situational awareness
- Uphill/upwind
- Set up perimeter ZONES: cold, warm, hot
- Additional resources
- Staging areas



# Who ya gonna call??

# **Poison Control**

# 800-222-1222







### Haz-Mat response

Nearest haz-mat team is equipped with PPE and means for decontamination.

# Leave the poisons where you found them – nobody else wants them!



#### Team Type HazMat Region



### MSDS/SDS

- Documentation telling the carrier everything that there is to know about the chemical/hazardous material.
- It is the responsibility of the person in possession of chemical to have this information on hand incase of release or exposure of chemical.
- Should be official from the manufacturer of the chemical.
- Will provide general knowledge about the chemical and outline steps to take to mitigate an emergency.

- Identification of the material and supplier
- Hazards • identification
- Composition, information on ingredients
- First aid measures
- Firefighting measures

- Accidental release measures
- Handling and storage
- Exposure controls / Transport personal protection
- Physical and chemical properties
- Stability and reactivity
- Toxicological information

- Ecological information
- Disposal considerations
- information
- Regulatory information
- Other information





SDS NUMBER: 000447-15-LPI SDS REVISIONS: FORMAT DATE OF ISSUE: 01/13/15 SUPERSEDES: 04/30/1 FOR CHEMICAL EMERGENCY, SPILL, LEAK, FIRE, EXPOSURE OR ACCIDENT, CALL CHEMTREC - DAY OR NIGHT 1-800-424-9300

#### 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

 

 1.1
 PRODUCT IDENTIFIER: TRADE NAME:
 CARBARYL 4L

 1.2
 RECOMMENDED USE:
 INSECTICIDE FOR AGRICULTURAL OR COMMERCIAL USE

 1.3
 SUPPLIER DETAILS: LOVELAND PRODUCTS, INC.

P.O. Box 1296 • Croolov, CO 90622 1296

1.4 24 Hour Emergency Phone: 1-800-424-9300 - Medical Emergencies: 1-866-944-8565 – Product Information: 1-888-574-2878 (LPI-CUST) U.S. Coast Guard National Response Center: 1-800-424-8802

#### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

Classification according to 29 CFR 1910.1200

Category 4

H302

# Placarding

- The only agrochemical required to have placards in any quantity are division 6.1 "poisonous by inhalation."
- There are many exceptions created for farmers to allow them to transport hazardous materials to and from their fields.
  - Crop dusters
  - Nurse tanks
  - Personal vehicle from final distribution point to ultimate point of application

### NFPA Rating Explanation Guide

#### HEALTH HAZARD

#### FLAMMABILITY HAZARD



This chart for reference only - For complete specifications consult the NFPA 704 Standard



# Insecticides



- Used as insecticides in home and farm settings.
- Agriculture is the leading cause of exposure due to its extensive reliance for insecticide use.
- Have been around since 1800s, but wasn't used in agriculture until after WWII.
- Doubles as a nerve agent (WMD).

- Severity depends largely on the amount and method of exposure.
  - Inhalation, ingestion, dermal contact
- Onset usually within minutes; often lasts for weeks.
- Can go from mild symptoms to fatal without warning.



- Salivation
- Lacrimation (shedding tears)
- Urination
- Defecation
- Gastroenteritis
- Emesis
- Miosis (pupil constriction)



### Treatments

#### organophosphate or carbamate insecticide poisoning

#### [individualize dose IV q3-5min prn]

Start: 1-3 mg IV x1, then may double dose q3-5min prn; Info: may give 10-20% loading dose/h IV infusion once pt stabilized; cont. atropinization until muscarinic sx gone; give atropine first if also using pralidoxime (2-PAM)









# Carbamates

### Carbamates

- Very similar structurally and mechanistically to organophosphates.
- Inhalation, dermal, GI exposure
- Can result from secondary exposure after spraying, but commonly occupational dermal or intentional oral ingestion.
- Accidental (Kids playing in ball field after spraying.)



KEEP OUT OF REACH OF CHILDREN READ SAFETY DIRECTIONS BEFORE OPENING OR USING



ACTIVE CONSTITUENT: 225 g/L METHOMYL (an anti-cholinesterase compound) SOLVENT: 593 g/L METHANOL

#### GROUP 1A INSECTICIDE

For the control of insect pests in various crops as specified in the Directions for Use

> IMPORTANT: READ ATTACHED LEAFLET BEFORE USE

#### CONTENTS: 20L



GROW CHOICE PTY LTD 113 Fitzroy Street Tarmworth NSW 2340 Phone: (02) 6766 3979 ABN 36 161 264 884



### Carbamates

- Presents like organophosphates, but due to difference in mechanism of action, toxicity generally < 24 hours.
- Symptom severity largely dose dependent.
- Typically, more benign when compared to organophosphate.
- Depressed mental status = poor prognosis

### Carbamate decontamination

- Remove substance from skin to stop absorption.
- Remove all clothing from patient.
- Triple wash (rinse, soap and water, rinse).
- Responders wear full PPE nitrile gloves provide barrier, latex gloves do not!
- Vomitous and diarrhea can still be contaminated from GI exposures.



# Pyrethroid

# Pyrethroid

- Commonly found in household repellants as well as agriculture setting.
- Dermal, inhalation, GI ingestion
- Relatively high safety profile in low doses mega-toxicity creates poorer outcomes.
- Can be mixed with organophosphates higher mixture, worse outcomes – typically related more to OP content in mixture.

# Pyrethroid



- Hyperglycemia in these exposures directly correlates to respiratory failure, acidosis, and hypotension.
- Life threatening symptoms:
  - Seizures
  - -Coma
  - -Hemorrhage
  - Pulmonary edema



# Aluminum Phosphide

# **Aluminum Phosphide**

• Very cheap and effective pesticide.



- Mainly through ingestion inhalation and absorption rare.
- Exposure depicts the side effects nonspecific.
- Early symptomatic care usually leads to a good outcome.
- Used around grain storage for rodent control.
- Reacts with water or acids to create phosphine gas this is the basis of the toxicity.

## Phosphine gas

- Colorless, flammable, and explosive gas at room temp.
- May smell like garlic or decaying fish.
- Usually lies in lower areas.
- Move patient to fresh air.
- Irrigate eyes and skin from potential phosphine gas exposure.



# Fertilizers



# Ammonium nitrate

# Ammonium nitrate

• Relatively safe, unless.....





### August 4,2020

### Beirut, Lebanon

### Ammonium nitrate

- Classified as an oxidizer
- Can become dangerous if altered by fire, heating in confined spaces, low pH (acid) environments, shock waves or spark
- Common uses
  - Fertilizers
     Pesticides
  - Pyrotechnics



# Anhydrous ammonia



# Anhydrous ammonia

- Anhydrous = without water
- NH<sub>3</sub> foundation for all nitrogen fertilizers
- Inhalation of gases, ingestion of liquid, contact with skin/eyes – reacts with moisture causing instant burns
- Erodes pulmonary epithelium ARDS, ALI, infection

### Anhydrous ammonia

- Irrigate burns with water for at least 15 minutes
- Flush eyes with water ~30 minutes
- Dilute GI contents with milk or water don't induce vomiting
- Mild exposures usually self limiting



# Herbicides



# Paraquat

### Paraquat

- Herbicide used throughout the country.
- Common due to its low cost and effectiveness.
- More likely to be a purposeful ingestion than accidental exposure.
- Used frequently in other countries as mean for suicide.



### Paraquat

- Paraquat tongue (ulcerations on tongue/mucous membranes) can lead to esophageal perforation.
- Acute respiratory distress syndrome
- Kidney failure
- Liver failure
- Lung fibrosis





- Larger ar
   Rapid
- Smaller amounts (<50mL)</li>
  - Lung and kidney toxicity within 2-6 days
- >50% mortality regardless of ingestion amounts
- All treatment efforts trialed at centers have proven to be futile.



# What can we do to help?

Scene safety – control emotion.

Assess situation – determine need for additional resources early! What kind of chemical are we dealing with?

Remove the patient safely.

Patient decontamination – leave the poisons on scene.

Eliminate scene times if possible.

# Ground or air?



## Air Medical Response Considerations



# Key takeaways

# Key takeaways

- Always be mindful and approach cautiously don't be a victim.
- Identify the toxin ASAP and relay information to appropriate individuals.
- Ensure proper decontamination transport the patient, not the poison.
- Stabilize and transport.



#### WARM Decontamination zone

#### HOT Immediate exposure



# Questions?

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