#### **PESTICIDES**

Advanced Level Training Texas Master Beekeeper Program



#### Introduction

- $\bullet$  People who use pesticides have the legal responsibility to read, understand and follow the label directions.
- Protection of people and the environment from harmful effects of pesticides is based primarily on three factors:
  Pesticides must be registered by the U.S. Environmental Protection Agency before they can be sold or applied.
- Pesticide labels provide necessary information to pesticide users for safety handling.
   Pesticides must be used according to label instructions to achieve effective pest control and safe handling.

#### **Label Requirements**

- Contents of a pesticide label:

  1. Name, brand, or trademark of product
- 2. Name and address of producer or registrant
- Net contents
  Product registration number
- Producing establishment number
- Ingredient statement
- Hazard and precautionary statements
   Human and domestic animal hazards
   Environmental hazards
- 8. Directions for use
- Use of classification(s)

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#### Product Name

- Every pesticide has a: Product name
- Brand name or trade name

#### Oxalic Acid Dihydrate Active Ingredient: Oxalic Acid Dihydrate: Inert Ingredients: TOTAL:

# **Net Contents** • The amount the container holds. Net Contents: 35 grams

#### Type of Pesticide

- The label must indicate what type of pesticide the product is or what types of pests it will control.
- Example: Livestock and Premise Insecticide
   For Agricultural/Commercial, Vector Control Agency, Pest Control Operator Use Only.
   For Control of Flies, Lice, Mites, and Ticks on livestock and their premises.
- Can be used on Lactating and Non-Lactating Dairy Cattle and Goats, Beef Cattle, Sheep, Swine, Poultry and Horses.
   Can be used in all areas of Dairy Barns, including Milk Rooms.
   For Control of Fleas and Ticks on Dogs as spray, dip wash or dip tank.

- For Control of Fire Ants as a mound drench.
   For aid in Control of Small Hive Beetles around Honey Bee Hives.

#### Types of Formulations

E or EC	Emulsifiable Concentrate
F, L, or FL	Flowables
D	Dusts
В	Baits
G	Granulars
MC	Microencapsulated
P or PS	Pellets
W or WP	Wettable Powders
S or SP	Soluble Powders
DF	Dry Flowables
WDG	Water Disperable Granules
WDL	Water Dispersable Liquids

#### Types of Formulations

• Other less common formulations include:

AF	Aqueous Flowables
AS	Aqueous Suspensions
ES	Emulsifiable Solutions
MTF	Multiple Temperature Formulation
OL	Oil-soluble Liquids
SL	Slurries

#### EPA Registration and Establishment Numbers

- Registration number: Indicates that the pesticide product has been registered and its label was approved for sale by the Environmental Protection Agency (EPA).
- $\bullet$  Establishment number: Identifies the facility where the product was produced.

- Examples: EPA Est. No. 73291-NC-001 EPA Reg. No. 91266-1-73291



#### Manufacturer Name and Address

- Provides the manufacturer's contact information in case you want more information about the product.
- Safety Data Sheet (SDS)
   Provides detailed toxicity information, chemical properties, and precautions needed for emergency personnel.
   Used to be called Material Safety Data Sheet (MSDS).

#### Ingredient Statement

- $\bullet$  Each pesticide label must include the active and inert ingredients in the product.
- The statement shows what the active ingredients are and the amount of each one.
- Must show the total percentage by weight of all inert ingredients.
- The ingredient statement must list the official chemical names and/or common names for all active ingredients.

## Oxalic Acid Dihydrate

## Active Ingredient: Oxalic Acid Dihydrate: Inert Ingredients: TOTAL:

#### Acute Toxicity Data

- $\bullet$  Information collected on the side-effects of the chemical during acute toxicity studies.
- $\bullet$  Precautionary statements, signal words, and first aid statements are determined based on these results.

	Table	e 1. Toxicity Catego	ories	
Study	Category I	Category II	Category III	Category IV
Acute Oral	Up to and including 50 mg/kg	> 50 thru 500 mg/kg	> 500 thru 5000 mg/kg	> 5000 mg/kg
Acute Dermal	Up to and including 200 mg/kg	> 200 thru 2000 mg/kg	> 2000 thru 5000 mg/kg	> 5000 mg/kg
Acute Inhalation <sup>1</sup>	Up to and including 0.05 mg/liter	> 0.05 thru 0.5 mg/liter	> 0.5 thru 2 mg/liter	> 2 mg/liter
Primary Eye Irritation	Corrosive (irreversible destruction of ocular tissue) or corneal involvement or irritation persisting for more than 21 days	Corneal involvement or other eye irritation clearing in 8-21 days	Corneal involvement or other eye irritation clearing in 7 days or less	Minimal effects clearing in less than 24 hours
Primary Skin Irritation	Corrosive (tissue destruction into the dermis and/or scarring)	Severe irritation at 72 hours (severe erythema or edema)	Moderate imitation at 72 hours (moderate erythema)	Mild or slight irritation at 72 hours (no irritation or slight erythema)

#### Signal Words

- DANGER-POISON along with a skull and crossbones symbol
   Products are highly toxic and potentially deadly at low doses. Danger-Poison will always be in red.
- DANGER (no poison)
   Products are corrosive and can cause irreversible eye damage or severe skin injury.
- WARNING
  Products are moderately toxic or can cause moderate eye or skin irritation.
- CAUTION
   Products are slightly toxic or may cause slight eye or skin irritation.



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Type of Study	Product A	Product B	Product C*	Product D	Product E*
Acute Oral	III	IV	1	III	III
Acute Dermal	IV	III	III	IV	III
Acute Inhalation	ш	IV	ш	ш	III
Primary Eye	III	11	1	1	III
Primary Skin	IV	IV	11	IV	III
Special Inert, e.g., methanol	No	No	No	No	Yes*
CORRECT SIGNAL WORD	CAUTION	WARNING	DANGER (Poison with X Skull & Crossbones)	DANGER	DANGER (Poison with > Skull & Crossbones)

"Product C and viroduct: must also bear adoptional specing (sout it crosscories symbol in cose proximit to the word "PoliSoN" which must appear in red on a contrasting background), Product C must bear the additional labeling as a result of the toxicity category I classification for the acute oral toxicity study. Product E must bear the additional labeling because it contains a special inert (methanol) at greater than 4%, as described in paragraph 8.1. above.

#### **Precautionary Statements**

- Precautionary statements identify potential hazards and recommend ways to minimize or avoid risks.
- Types of precautionary statements include: "Hazards to Humans and Domestic Animals"
- "Environmental Hazards"
- "Physical or Chemical Hazards"

#### Hazards to Humans and Domestic Animals

- $\bullet$  This statement is required for products with a Toxicity Category of 1, 2, or 3.
- The signal word is listed, followed by statements indicating which routes of entry (mouth, skin, lungs, eyes) are the most likely routes of exposure which result in harm and must be particularly protected.
- $\bullet$  The label provides specific actions that can prevent overexposure to the pesticide.
- $\bullet$  The label indicates whether the major concern is irritation, corrosiveness, or  $\ldots$
- Protective clothing and equipment required to handle or apply the pesticide is listed here, as are laundering instructions.

#### Hazards to Humans and Domestic Animals

PRECAUTIONARY STATEMENTS HAZARDS TO HUMANS AND DOMESTIC ANIMALS

#### DANGER

# **Environmental Hazards** • Environmental hazards section of the label warns of pesticide risks to wildlife, birds, fish, bees or to the environment, including water quality. $\bullet$ It provides practical ways to avoid harm to organisms and the environment. Physical Hazards • Listed under the "Precautionary Statement" Lists the personal protective equipment required in order to use the product. At-home Safety Precautions "Keep out of reach of children" statement required on all pesticide containers, unless proven that the interaction with children at any time is unlikely. • Keep pesticides and other home products out of the reach of children and pets.

#### Statement of Practical Treatment

- Statement of practical treatment lists the first aid treatment recommendations for someone accidentally exposed to a pesticide.
- ALWAYS call the National Poison Center Hotline (1-800-222-1222).

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#### Statement of Practical Treatment

if swallowed	-Call a poison control center or doctor immediately for treatment advice -Have person sip a glass of water if able to swallow.  -DO NOT INDUCE VOMITION curies to fit to by the poison control center or doctor: -Do not give anything to an unconscious person.
If on skin or clothing	-Take off contaminated clothingRinse skin immediately with plenty of water for 15-20 minutes Call a polson control center or doctor for advice.
If inhaled	-Move person to fresh air, -if person is not breathing, call 911 or an ambulance, then give artificial respiration, if possible, DO NOT use mouth-to-mouth method if victim ingested or inhaled the substance, use respiratory medical deviceCall a poison control center or oductor for advice.
If in eyes	-Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.  -Call a poison control center or doctor for advice.

#### Note to Physician

- Provides emergency medical personnel with poison treatment information and suggests antidotes.
- It often provides an emergency phone contact for further information.

	FIRST AID
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#### Example of Note to Physician

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Provide general supportive measures and treat symptomatically. Treatment should be rapidly instituted by giving a dilute solution of calcium lactate, limewater, finely pulverized chalk, plaster, and/or milk to supply large amounts of calcium to inactivate oxalate by forming an insoluble calcium salt in the stomach. Gastric lavage is controversial, since this may compound an already severe corrosive lesion in the esophagus or stomach. However, if used, gastric lavage should be done with limewater (calcium hydroxide). Intravenous gluconate or calcium chloride solutions should be given to prevent hypocalcemic tetany; in severe cases parathyroid extract also has been given. Additionally, acute renal failure should be anticipated, and careful fluid management is necessary. Metabolically its toxicity is believed to be due to the capacity of oxalic acid to immobilize calcium and thus upset the calcium-potassium ratio in critical tissues. Effective therapy against burns from oxalic acid involves replacement of calcium.

#### Directions for Use

- Must be written in a way that is easily understood by any user.
- Written to protect users from personal injury and to protect the environment.
- "It is a *violation of Federal law* to use this product in a manner inconsistent with its labeling."

# DIRECTIONS FOR USE

#### Directions of Use Includes:

- Site(s) of application
   i.e. crops, animals, areas, or objects to be treated
- 2. Target pest(s)
- 3. Dosage rate associated with each site and pest
- Method of application
   Instructions for dilution, if necessary
   Application equipment needed
- Frequency and timing of application
- Directions for storage, residue removal, and disposal of chemical and container
- Limitations/restrictions of use

## DIRECTIONS FOR USE, continued is a violation of Federal law to use this oduct in a manner inconsistent with its seline. APPLICATION DIRECTIONS: Oxalic acid is used to treat broadless colonies, packages, or swarms. This product can also be used as a "clean up" Varn treatment 30 days following a formic acid application where Varnos infestations are problematic. USE RESTRICTIONS: Ovalic Acid Dihydrate applications are for VAPORIZER METHOD: Apply only to outdoor colonies with a restricted lover hive entrance. Seal all upper hive entrances and cracks with tage to savid except of Oralic Acid Vapor. Smoke bases up from the bottom board. Place 2.0 g Oralic Acid Othydrate powder into vaporizer. Follow the vaporizer manufacturer's directions for use. Insent the vaporizer apparatus through the bottom entrance. Apply heart all all Oralic Acid thas solimitated. Spray broodless package bees with a 1:1 sugar-water solution at least 2 hours before spraying with oxalic acid. This allow bees to fill honey stomachs with sugar water reducing ingestion of oxalic acid. Mix a 2.8% cisals acid solution by dissolving 35 g of Oxalic Acid Dihydrate in 1 liter of 1:1 sugar; water (weight volume Evenly apply 3.0 mL of 2.8% cisals acid solution per 1,000 bees using a pump sprayer or battery powered sprayer (to example, a bytical 3 to package contains approximately 7,000 bees which requires 2.1 mL of solution). Apply solution on both sides of the package. Store bees in a cool darkened room for 72 hours before hiving. POST TREATMENT CLEANUP: All clean up and maintenance activities should be performed in a well-ver RESISTANCE MANAGEMENT: Any Varroa mile population has the potential to become resistant to insecticides. Resistance development is affected by both the frequency of application and ratel ideas of application. Continued relaince on a single class of miciside or single miticide with the same mode of action will select for resistant individuals which may dominate the mitte population in subsequent generations. In order to prevent resistance development and to maintain the usefulness of individual insecticides it is important to adopt appropriate resistant management strategies. Versistance: Vibra possible, rotate the use of miticides to reduce selection pressure as compared to repeatedly using the same product, mode or action or chemical class. If multiple applications are required, use a different mode of action seat time before returning to a previously-used one. Base miticide use on integrated Pest Management (PM). This includes proper pest identification, monitoring for locality specific economic thresholds and economic injury levels, record keeping, and utilizing all available control practices (cultural, biological and chemical). Maximize efficacy by following all label instructions including dosage and timing of application. Storage and Disposal All pesticide labels contain general instructions for the appropriate STORAGE AND DISPOSAL Do not contaminate water, food, or feed by storage or disposal. storage and disposal of the pesticide and its container. PESTICIDE STORAGE: Store only in original container, in a dry place inaccessible to children, pets, and domestic animals.

PESTICIDE DISPOSAL: Waster resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

PLASTIC CONTAINER DISPOSAL: Triple rinse container (or equivalent) promptly after use. Offer or recycling, if available. Otherwise, puncture and dispose of in a sanitary landfill, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

#### Ways to Protect Pollinators

- $\bullet$  Restrict the use of pesticides on plants/crops that are flowering.
- The Environmental Protection Agency (EPA) has created a **bee advisory box** that will be placed on pesticide labels.

  More clear and precise applicator directions
- EPA provides a list of approved pesticides used to combat Varroa mites.
- Check with your state pesticide regulatory agency to check which products have been
- http://npic.orst.edu/reg/state\_agencies.html#map



#### Sources

- https://www.epa.gov/pesticide-labels
- https://www.epa.gov/pesticide-registration/label-review-manual
- $\bullet \ \underline{https://texasagriculture.gov/RegulatoryPrograms/Pesticides/PesticideLinks.aspx}$
- http://www.ecfr.gov/cgi-bin/text-idx?SID=a8de8692c293c9ceo6581f762b8195af&mc=true&tpl=/ecfrbrowse/Title40/ 4ocfr156\_main\_o2.tpl
- https://www.epa.gov/pesticides
- https://www.epa.gov/pollinator-protection/epa-actions-protect-pollinators