PESTICIDE SAFETY: LABELS, TOXICOLOGY & PPE

WHAT IS A PESTICIDE?

Pesticides are chemicals used to destroy, prevent or control pests. Pests include weeds, diseases, and insects. Pesticides also include chemicals used to regulate plant growth or remove or coat leaves.

“Pesticide” can mean a fungicide, herbicide, insecticide, rodenticide, etc.

LABELS/LABELING*

- Label – on or attached to container
- Labeling – label plus other manufacturer information
- *must be approved by
- and registered with EPA

LABELING

- **Includes:**

- **Label**
- **Brochures**
- **Flyers**
- **Product Info**
- **Etc.**

- **Must not differ from info furnished to EPA when product was registered**

LABEL = INSTRUCTIONS

- Describes risks and benefits of the product
- Primary source of information to user
- Information tells how to use product safely and correctly
- Primary tool of pesticide regulation
- Must be approved by and registered with EPA

READING THE LABEL

Most valuable few minutes you can spent in pest control

Small investment of time will help avoid injuring yourself, others, or the environment by misusing the pesticide.

Understanding the Label

Read before you buy to be sure you are buying the right product for the job.

Buy the proper amount so you can avoid storage, and dispose of container and left-over product properly.

Very important! Understand the potential dangers and keep out of the reach of children.

It is important to keep products in the original container in case of accidental poisoning so you can follow the first aid instructions and have the list of ingredients available to give to poison control.

PESTICIDE USE CLASSIFICATIONS

Restricted Use – may cause unreasonable adverse effects to the environment or humans, even if used as directed.

Unclassified – usually no adverse effects if used as directed.

WHY RESTRICTED USE?

- Acute toxicity (humans, birds, mammals)
- Oncogenicity (tumors in laboratory animals)
- Groundwater concern
- Other concerns

RESTRICTED USE DESIGNATION

- **"RESTRICTED USE PESTICIDE"**

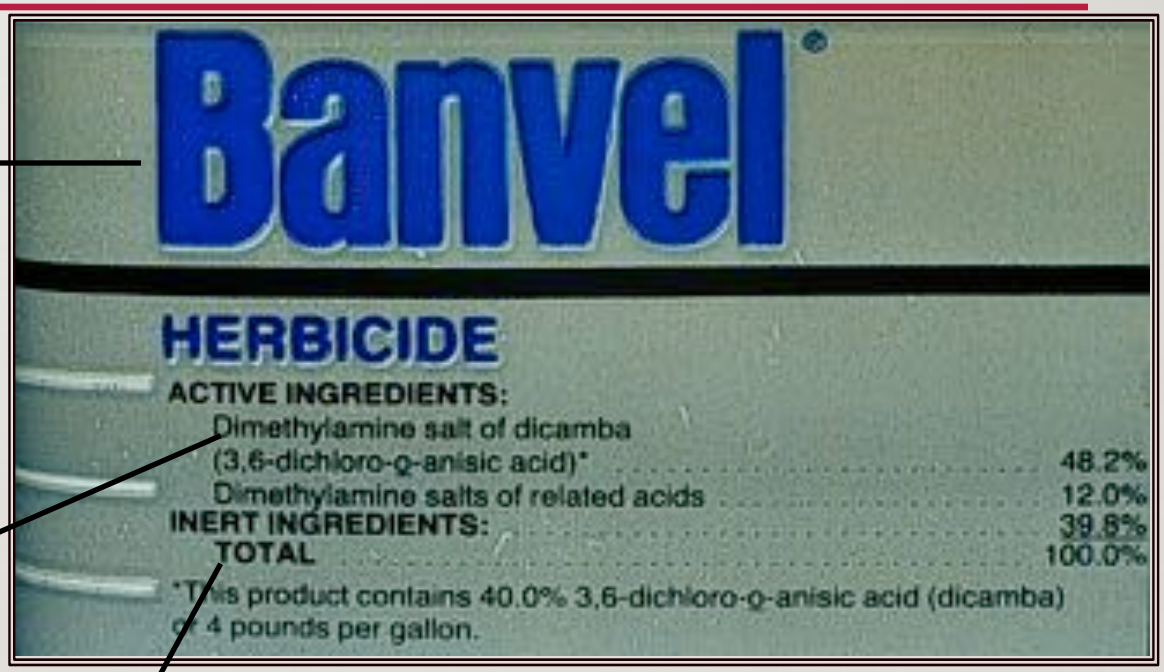
- **always in a box at top of the front panel**
- **on the pesticide label**

TRADE NAME/INGREDIENTS STATEMENT

Trade Name

Active Ingredients

Common & chemical name



Inert Ingredients

Dissolve active ingredient or affect how product works (may contain synergist, spreader, etc.)

PRODUCT OR TRADE NAME

TYPES OF FORMULATIONS*

- **Emulsifiable concentrates (EC)**
- **Flowables (F)**
- **Wettable powders (WP)**
- **Dry flowables (DF)**

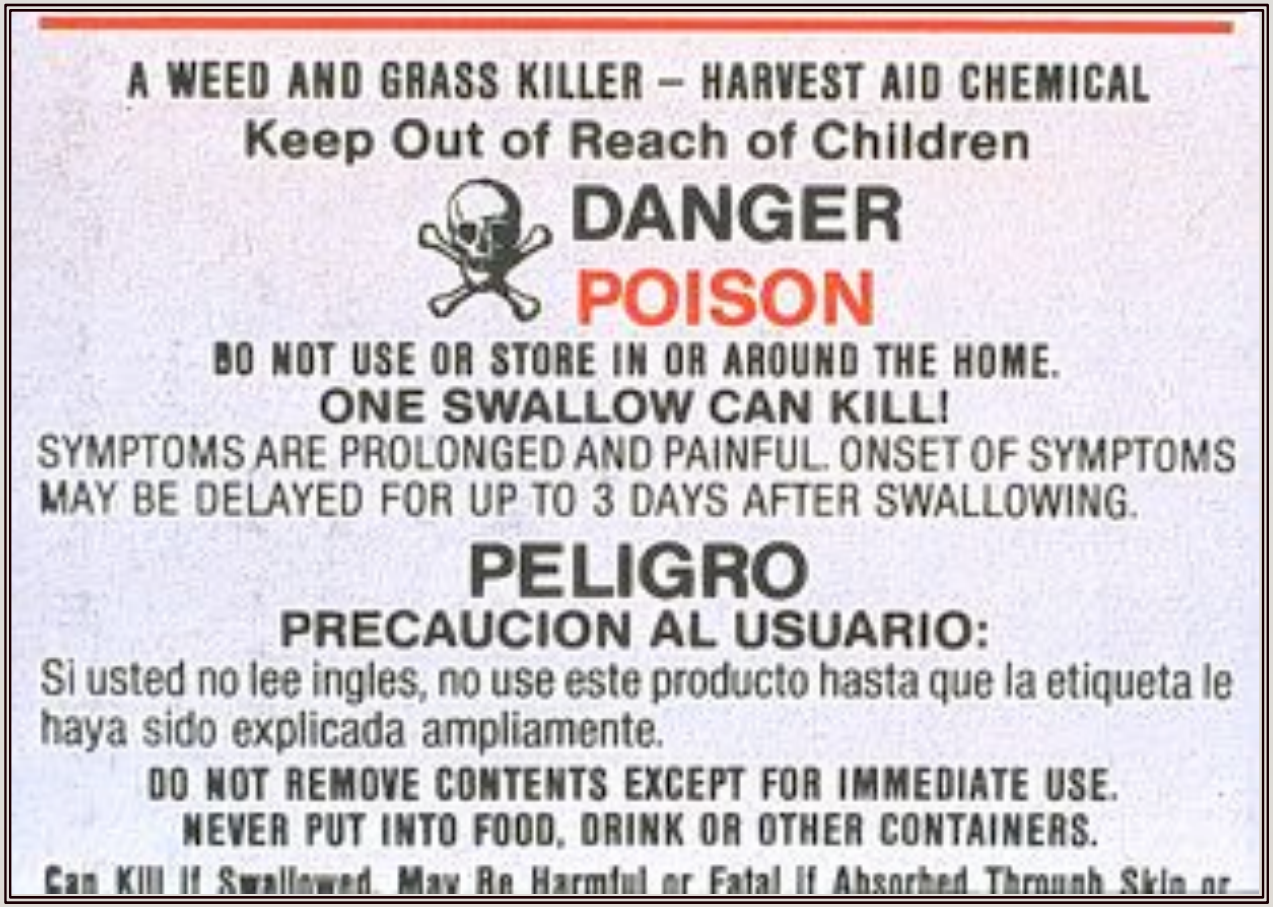
* Trade names used as examples - no endorsement intended.

TYPES OF FORMULATIONS*

- Water-miscible liquids
- Water-soluble powders
- Oil solutions
- Soluble pellets
- Ultralow-volume concentrates
- Fogging concentrates
- Dusts
- Aerosols
- Granular
- Fumigants
- Impregnating materials
- Baits
- Microencapsulated
- Other slow-release formulations

SIGNAL WORDS ON LABELS

Indicate potential hazard



SIGNAL WORDS

- DANGER* - highly toxic
- WARNING – moderately toxic
- CAUTION – slightly toxic

- *with skull/crossbones/POISON = acute illness
- *without skull/crossbones/POISON = skin/eye irritation potential

SIGNAL WORDS ON LABELS

Danger

Warning

Caution

Caution

DANGER - POISON

- **Highly toxic by any route of entry**

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
AND DOMESTIC ANIMALS

RESTRICTED USE PESTICIDE

Due to Acute Toxicity

For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

Bayer CropScience

Guthion® Solupak 50%

Wettable Powder Crop Insecticide

IN WATER SOLUBLE PACKETS

For effective economical insect control.

ACTIVE INGREDIENT:

O,O-Dimethyl S-[(4-oxo-1,2,3-benzotriazin-3(4H)-y)methyl]phosphorodithioate 50%

INERT INGREDIENTS: 50%

100%

EPA Reg. No. 264-733 EPA Est. No. 3125-MO-1

DEALERS SHOULD SELL IN ORIGINAL PACKETS ONLY

Keep water soluble packets in [illegible] and store in a cool dry place, [illegible] (32F). Protect from heat. Keep away [illegible] open flame. Do not heat. Entire inner packets dissolve in water. After [illegible] outer bag, drop the [illegible] unopened inner packets into spray tank as directed. Do not excessively handle water soluble [illegible] or [illegible] it to moisture, since this may cause breakage

STOP – Read the label before use.

KEEP OUT OF REACH OF CHILDREN

DANGER POISON

PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.
(If you do not understand the label, find someone to explain it to you in detail.)

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

Fatal if swallowed. May be fatal if inhaled. Harmful if absorbed through skin. Causes moderate eye irritation. Do not breathe dust or spray mist. Avoid contact with skin, eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove contaminated clothing and wash clothing before reuse.

DANGER PELIGRO

- can cause severe eye damage or skin irritation

DANGER
PELIGRO

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
AND DOMESTIC ANIMALS
DANGER

Causes irreversible eye damage.....

AMINE 4

2,4-D WEED KILLER

For Selective Broadleaf Weed Control in Certain Crops, Turf and Non-Crop Areas.

ACTIVE INGREDIENT:	
*Dimethylamine salt of 2,4-Dichloro-phenoxyacetic acid	46.5%
INERT INGREDIENTS:	53.5%
TOTAL	100.0%

*Equivalent to 38.6% 2,4-D acid or 3.74 pounds per gallon.
*Isomer specific by AOAC Method No. 6.275-6.279 (13th Ed.)

KEEP OUT OF REACH OF CHILDREN

DANGER — PELIGRO

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand this label, find someone to explain it to you in detail.)

(See Below for Additional Precautionary Statements)

EPA REG. NO. 34704-120

NET CONTENTS 2½ GAL. (9.4[illegible])

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER — PELIGRO

Corrosive. Causes irreversible eye damage. Do not get in eyes or on clothing. Harmful if swallowed, inhaled, or absorbed through skin. Avoid contact with skin. Avoid breathing spray mist. Wash thoroughly with soap and water after handling. Remove contaminated clothing and wash before reuse. Do not contaminate water used for irrigation, domestic or spray purposes.

Personal Protective Equipment:

Applicators and other handlers must wear: Long-sleeved shirt and long pants, waterproof gloves, shoes plus socks and protective eyewear. Follow manufacturer's instructions for cleaning/maintaining

USER SAFETY RECOMMENDATIONS

Users should:

Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.

Remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.

Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

FIRST AID

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 treatment advice.
If swallowed:	• Call a poison control center or doctor immediately for treatment advice. • Have a person sip a glass of water if able to swallow. • Do not induce vomiting unless told to do so by the poison control center or doctor. • Do not give anything by mouth to an unconscious person.
If on skin or clothing:	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.
If inhaled:	• Move person to fresh air. • If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible. • Call a poison control center or doctor for further treatment advice.

FOR A MEDICAL EMERGENCY INVOLVING THIS PRODUCT CALL: 1-800-228-5635, EXT. 136, OR CALL COLLECT, 612-851-0180, EXT. 136.

Corrosive. Eye Damage

WARNING AVISO

- **Moderately toxic**

WARNING
AVISO

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS
AND DOMESTIC ANIMALS
DANGER

Causes moderate eye damage and/or skin irritation.....

21154Z3-1/CG

Roundup ORIGINAL™
HERBICIDE

Complete Directions for Use

EPA Reg. No. 524-445

AVOID CONTACT WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, SINCE SEVERE INJURY OR DESTRUCTION MAY RESULT.

Roundup Original, Monsanto and the Vine symbol are trademarks of Monsanto Company.

2000-1

Read the entire label before using this product.

Use only according to label instructions.

Read "LIMIT OF WARRANTY AND LIABILITY" before buying or using. If terms are not acceptable, return at once unopened.

OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Keep out of reach of children.

WARNING! AVISO!

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle. (If you do not understand the label, find someone to explain it to you in detail.)

CAUSES SUBSTANTIAL BUT TEMPORARY EYE INJURY.

HARMFUL IF SWALLOWED OR INHALED.

Do not get in eyes or on clothing.

Avoid breathing vapor or spray mist.

FIRST AID: IF IN EYES, immediately hold eyelids open and flush with plenty of water for at least 15 minutes. Get medical attention.

IF INHALED, remove individual to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

IF SWALLOWED, this product will cause gastrointestinal tract irritation. Immediately dilute by swallowing water or milk. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

Personal Protective Equipment (PPE)

Applicators and other handlers must wear: long-sleeved shirt and long pants, shoes plus socks, and protective eyewear. Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them

Caution

- slightly toxic

MICRO FLO
THE PLANT HEALTH AND PROTECTION COMPANY

KUMULUS® DF

fungicide/acaracide

ACTIVE INGREDIENT:	
Sulfur	80%
INERT INGREDIENTS:	20%
TOTAL	100%

KEEP OUT OF REACH OF CHILDREN

CAUTION

FIRST AID

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 vomiting unless told to do so by the poison control center or doctor. Do not give anything by mouth to an unconscious person.
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 treatment advice.
If On Skin or Clothing: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advice.

PRECAUTIONARY STATEMENTS

Hazards to Humans and Domestic Animals

Harmful if swallowed. Avoid breathing spray mist. Avoid contact with eyes, skin, and clothing.

DIRECTIONS FOR USE

What the pesticide product controls.
Where, how and when to use the product.
Entry statement
Storage/Disposal/Mixing
For: Plants, Animals, Sites
Pests, How much
Equipment
Potential injuries
When, How often, Where
It's critical that applicators understand and follow these statements!

How AMDRO Fire Ant Bait Works:

1. ***AMDRO is a bait. Worker ants carry it into the mound as food for the colony.***
2. ***They eat it and feed it to the queen. AMDRO starts to kill ants immediately.***
3. ***In about a week the queen is dead, which destroys the mound.***

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

This product is not for use on vegetable or other food crops, timber or plants grown for sale or other commercial use, or for commercial seed production, or for research purposes.

Application Restrictions: Do not apply this product in a way that will contact any person or pet, either directly or through drift. Keep people and pets out of the area during application.

Outdoor Use:

For large, infested areas: Using a hand-held granular spreader, broadcast AMDRO at 2 to 4 ounces per 5,000 square feet (1 to 2 pounds per acre).

For individual mounds: Sprinkle 2 to 5 level tablespoons of AMDRO around the mound. Do not disturb the mound. Use a disposable scoop (do not use a kitchen utensil).

For best results, apply AMDRO when ants are active. Repeat application as needed.

AMDRO fire ant bait controls imported and native fire ants and other ants, such as harvester ants, bighedded ants and Argentine ants. AMDRO fire ant bait is for use ONLY on lawns, landscaped areas, golf courses, commercial grounds, parks and other non-cropland areas, as well as on grounds surrounding poultry houses (excluding runs and ranges) or corrals and other animal holding areas. AMDRO may be applied to pastures and rangeland. If used **ONLY for COMPANION ANIMALS** (horses, llamas, etc.). Companion animals grazed on treated areas **cannot** be used for food or feed. Do not graze or feed treated lawn or sod clippings to livestock. Avoid direct exposure of animals to AMDRO granules.

STORAGE AND DISPOSAL

Store in cool, dry, secure place and keep container closed. Store container away from pets. When properly stored, this product will retain its effectiveness for up to three months after the package has been opened.

Container Disposal: If empty: Do not reuse this container. Place in trash or offer for recycling if available. If partially filled: Call your local solid waste agency or 1-800-CLEANUP for disposal instructions. Never place unused product down any indoor or outdoor drain.

FIRST AID

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact (888) 265-0761 for emergency medical treatment information.

If on skin or clothing	Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment 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 treatment advice.

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Harmful if absorbed through skin. Causes moderate eye irritation. Avoid contact with eyes, skin or clothing. Wear long-sleeved shirt and long pants, socks and shoes, and chemical-resistant gloves (such as rubber or waterproof gloves). Wash thoroughly with soap and water after handling.

ENVIRONMENTAL HAZARDS

This product is toxic to fish. Do not apply directly to water. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.

Ambrands makes no express or implied warranty, including any other express or implied warranty, of FITNESS or of MERCHANTABILITY.

In case of an emergency endangering life or property involving this product, call day or night, Area Code (888) 265-0761

EPA Reg. No. 72043-1 EPA Est. No. 9805-AR-1
Manufactured for AMBRANDS Atlanta, GA 30339

AMBRANDS
Atlanta, GA 30339

DIRECTIONS FOR USE BY REFERENCE

Must obey directions contained in documents that are only referred to on the product labeling

No longer room on traditional label to explain the requirements of all laws and regulations.

This statement would probably be the ONLY indication in the labeling material that other use directions and restrictions apply

You are responsible for determining if the document referred to applies to your situation

MISUSE STATEMENT

Reminder – violation of Federal law to use product in a manner inconsistent with its label

No pesticides may legally be used or recommended in any way that conflicts with the recommendations on the registered label

MISUSE STATEMENT

- **Illegal uses or recommendations**
  - **Increase the label rate of application**
  - **Change method of application**
  - **Change time of application**
  - **Not following other conditions on the label**

MISUSE STATEMENT

- **Not illegal to use a pesticide:**
  - **At rates less than those recommended**
  - **Less frequently than recommended**
  - **For a pest not listed on the label if the site is listed**
  - **In combination with fertilizers**
  - **In combination with other pesticides, providing that labeled rates are not exceeded and the combination is not prohibited on the label**

REENTRY STATEMENT

- Tells how much time must pass before a treated area is safe to enter by a person without protective clothing

PRECAUTIONARY STATEMENTS

Hazards to humans and domestic animals

Protective equipment listed here

Environmental hazards

Ex. Toxic to bees, Do not contaminate water

Physical & chemical hazards

Fire, explosion, etc.

FIRST AID

Tells what to do if someone accidentally swallows or breaths the pesticide, or gets it on their skin or in their eyes.

May also contain section labeled "Note to Physicians" which provide doctors with specific medical information

WARRANTY STATEMENT

Statement intended to limit company's liability,

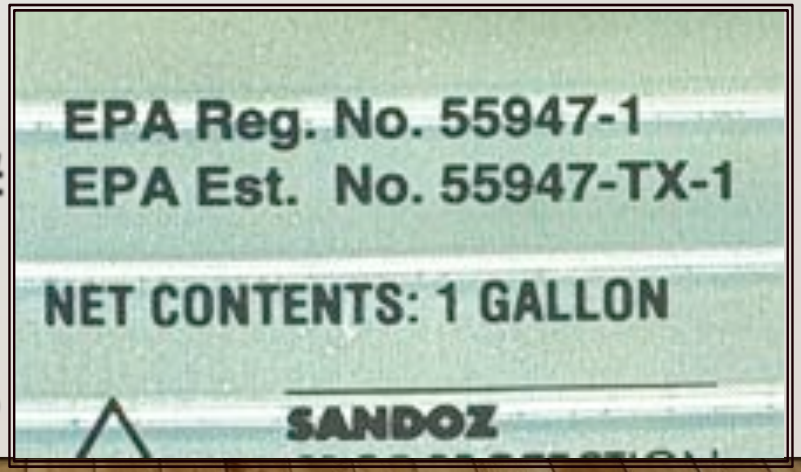
or to act as a disclaimer,

or as a warranty for the product

OTHER LABEL INFORMATION

Manufacturers Name &Address

EPA Registration #
EPA Establishment #
&
Net Wt./Net contents



HAZARD = TOXICITY X EXPOSURE

risk; the potential for injury

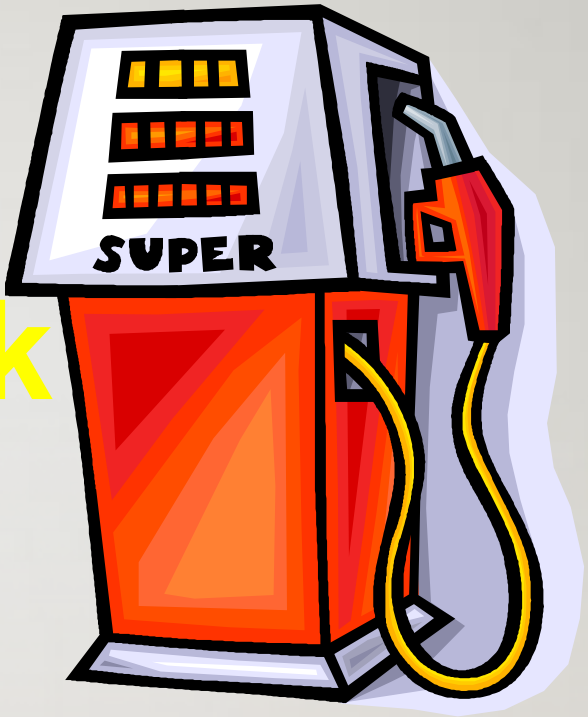
the capacity of a pesticide to cause injury

the risk of a pesticide contacting or entering the body

HAZARD

- Higher toxicity = greater hazard
  - Lower toxicity = less hazard
- Higher exposure = greater hazard
  - Lower exposure = less hazard

High toxicity,
Low exposure risk



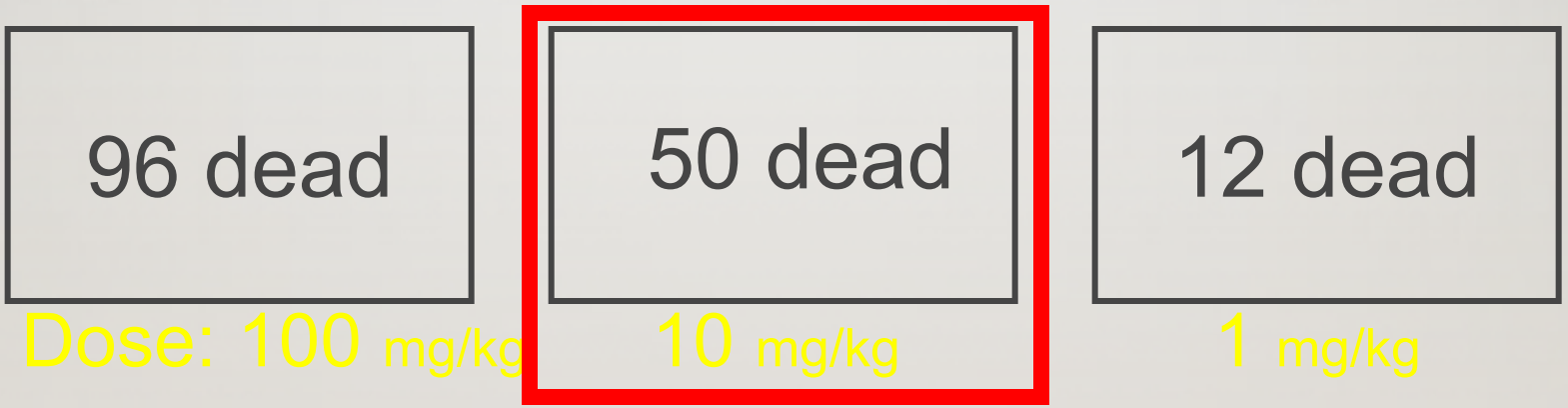
Low toxicity,
High exposure
risk

HAZARDS INCREASE…

- when mixing and loading the concentrate
- with a very high single exposure
- after many exposures over time

LD_{50} AND LC_{50}

- LD_{50} = the *dose* of a substance that kills 50% of a population of test animals
  - measured in milligrams of toxicant per kilogram of body weight (mg/kg)



- LC_{50} = *concentration* of a substance in air or water that kills 50% of a test population, measured in parts per million

RISK = TOXICITY X EXPOSURE

Common Pesticides	Oral LD_{50} (mg/kg – rats)
❖ Temik	0.93 (.002 oz/150#)
❖ carbaryl	500 – 850 (1.2 oz)
❖ 2-4-D	600
❖ cyfluthrin	900
❖ malathion	1375
❖ pyrethrins	1500 (3.5 oz)
❖ glyphosate	4,320
❖ chlorothalonil	10,000 (23 oz)

RISK = TOXICITY X EXPOSURE

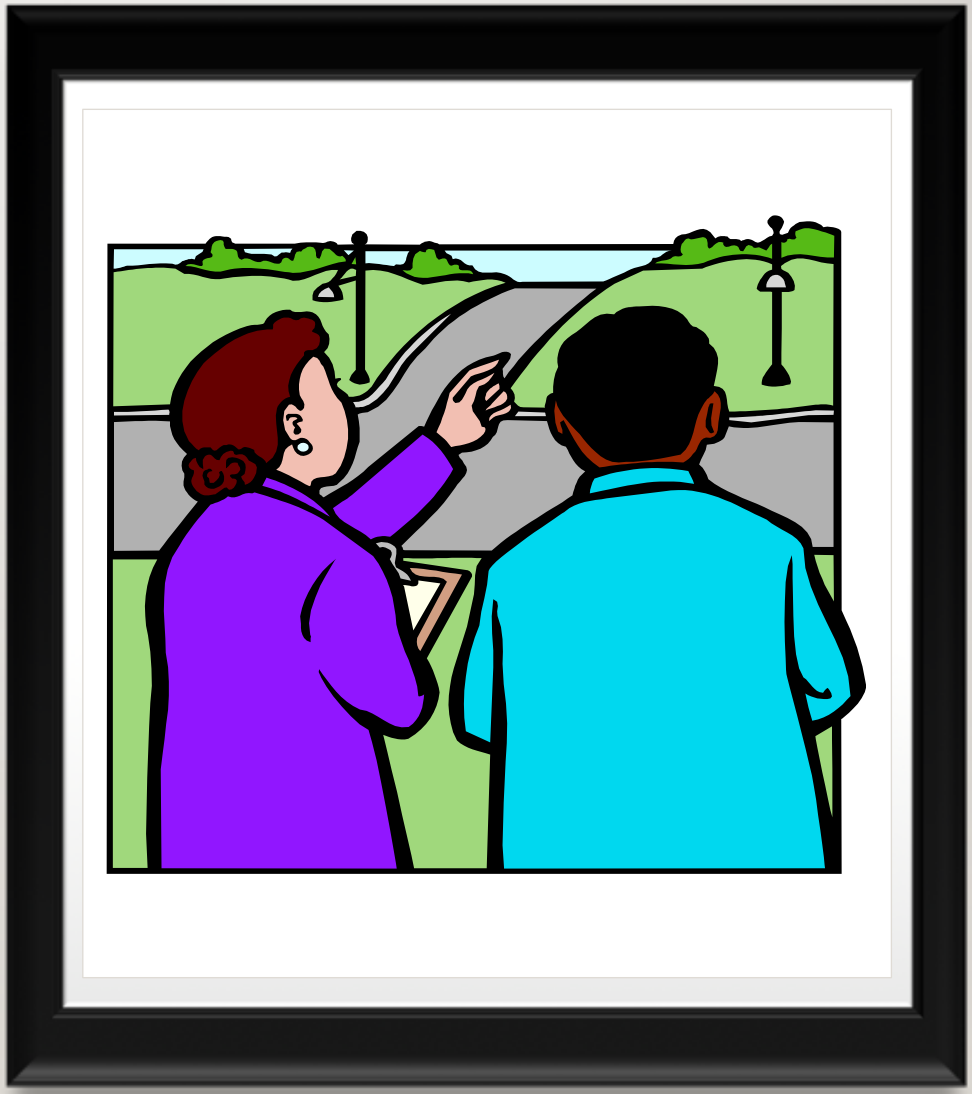
Common Substances	Oral LD_{50} (mg/kg – rats)
Nail Polish Remover	10.7
Nicotine	50
Caffeine	355
Ibuprofen	626
Aspirin	1,000 (2.3 oz)
Table Salt	3,750
Antifreeze	8,540
Aspartame	10,000

SIGNAL WORDS

Signal Word	Category	Toxicity	Oral LD_{50}
Danger-Poison Peligro	I	High	0-50 mg/kg A few drops to one tsp
Danger/Peligro	I	High - Eye or skin damage concerns greater than acute lethal toxicity	
Warning/Aviso	II	Moderate	50-500 mg/kg or skin/eye tsp -oz
Caution	III	Slight	>500 mg/kg or skin/eye > oz

ATTITUDE MAKES A DIFFERENCE

- Read and follow the label carefully
- Be aware of the people and the environment in and around treated areas



TYPES OF TOXICITY TO PESTICIDES

Acute – usually immediate, obvious, reversible

Delayed – "chronic", usually from repeated doses

Allergic – immune system response to chemicals

ACUTE EFFECTS

Oral – examples: burned mouth, sore throat, upset stomach

Inhalation – examples: pain or tightness in chest

Dermal (skin) – examples: itching, blisters, rash

Ocular (eyes) – examples: irritation, temporary or permanent blindness

ACUTE EFFECTS…

- Occur from a single exposure
- Develop within 24 hrs of exposure

DELAYED (CHRONIC) EFFECTS

- **May appear long after exposure:**

Tumors

Gene effects

Miscarriage

Impotence

Birth defects

Infertility

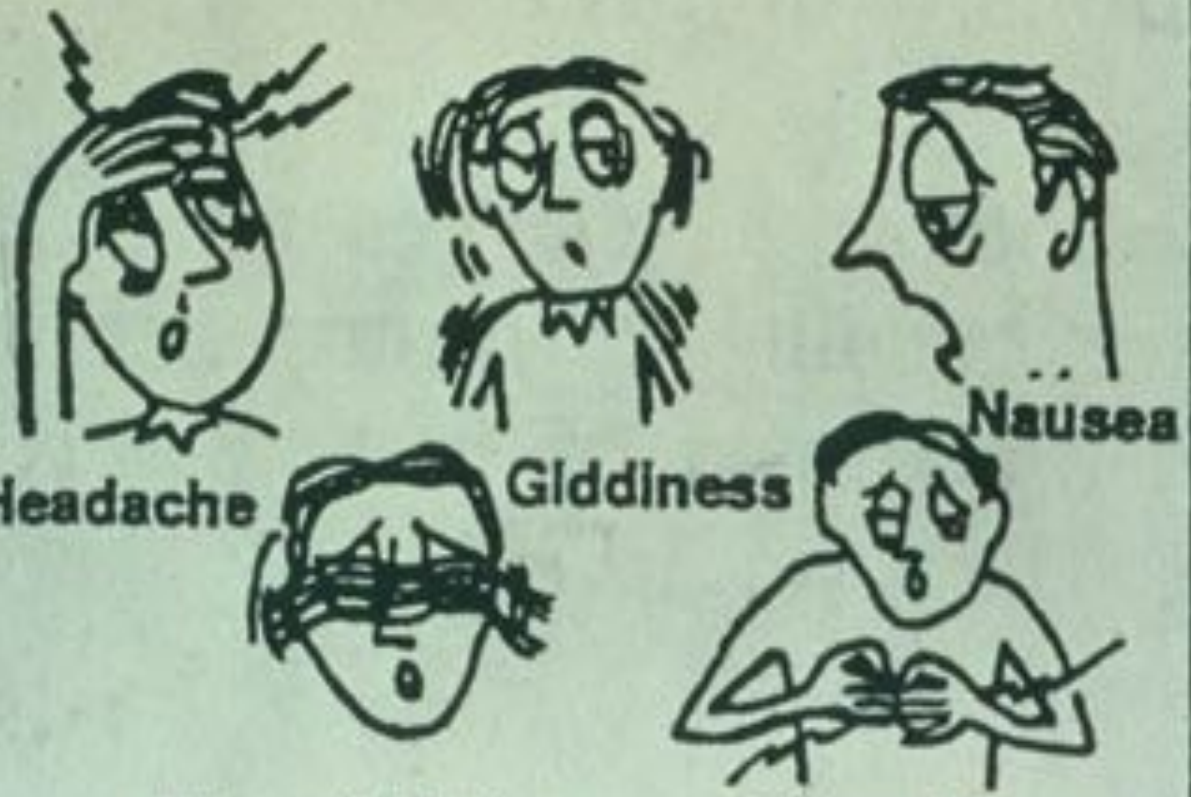
Sterility

Nervous system disorders

TYPES OF ALLERGIC EFFECTS

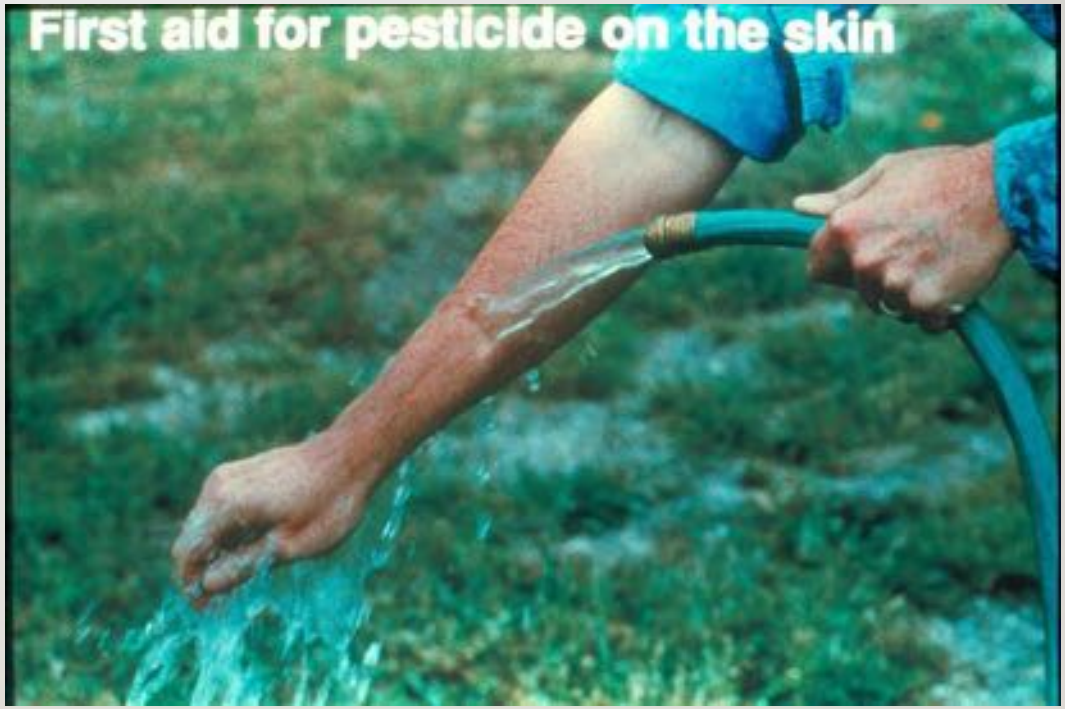
- **Systemic – as asthma, shock**
- **Skin irritation – rash, blisters, sores**
- **Eye and nose – itchy/watery eyes, sneezing**
- **Will occur with every exposure to the offending chemical**

General Symptoms Associated with Pesticide Poisoning



FIRST AID - SKIN

- **Drench with water**
- **Remove clothes**
- **Wash body with mild soap/water**
- **Avoid chills/overheating**
- **Burns: apply loose, clean, dry covering**
- **No ointments (unless prescribed)**

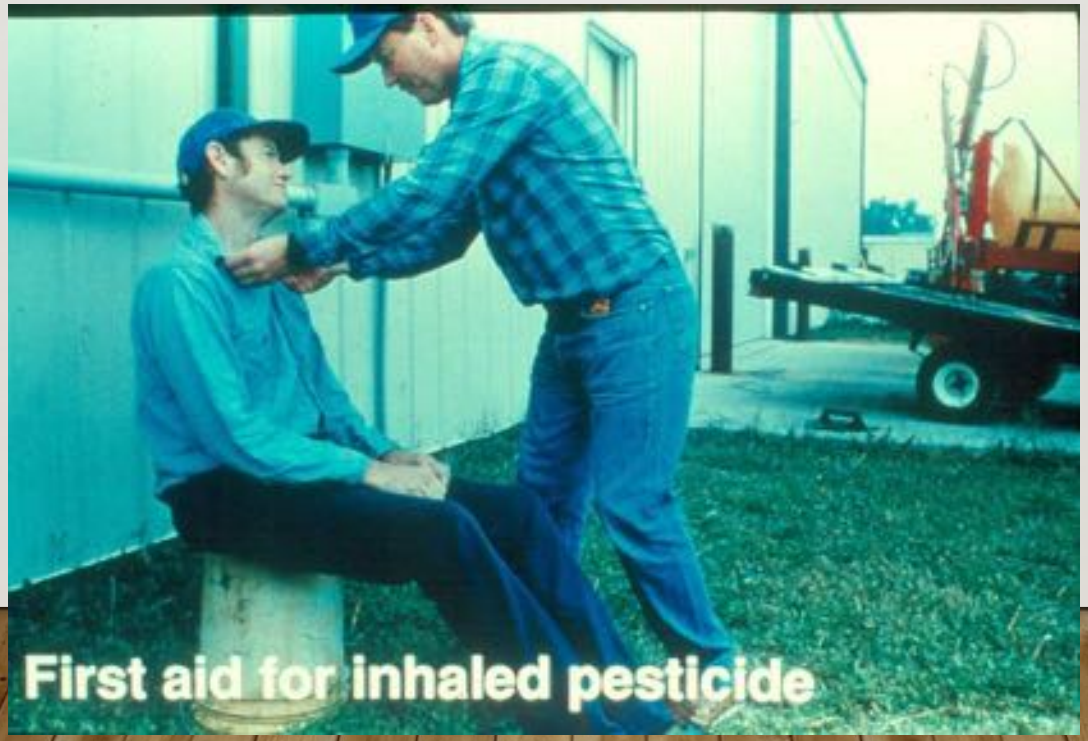


FIRST AID - EYES

- **Wash quickly (eye wash or water)**
- **Rinse eye with cool, clean water 15 for more minutes**
- **No chemicals/drugs in rinse**

FIRST AID - INHALATION

- **Get to fresh air**
- **Loosen clothing**
- **Artificial respiration (if needed)**



FIRST AID – MOUTH/SWALLOWED

- **Rinse mouth**
- **Drink milk/water (up to 1 qt.)**
- **Induce vomiting (if label says so)**

FIRST AID – MOUTH/SWALLOWED

- **Do NOT induce vomiting if:**
  - ✓ **unconscious/convulsions**
  - ✓ **corrosive poison swallowed**
  - ✓ **EC or oil solutions**
  - ✓ **label prohibits**

THE LAW SAYS

- **Federal law requires that highly toxic pesticides contain instructions for the physician on the label in case of pesticide poisoning.**

EMERGENCY RESPONSES

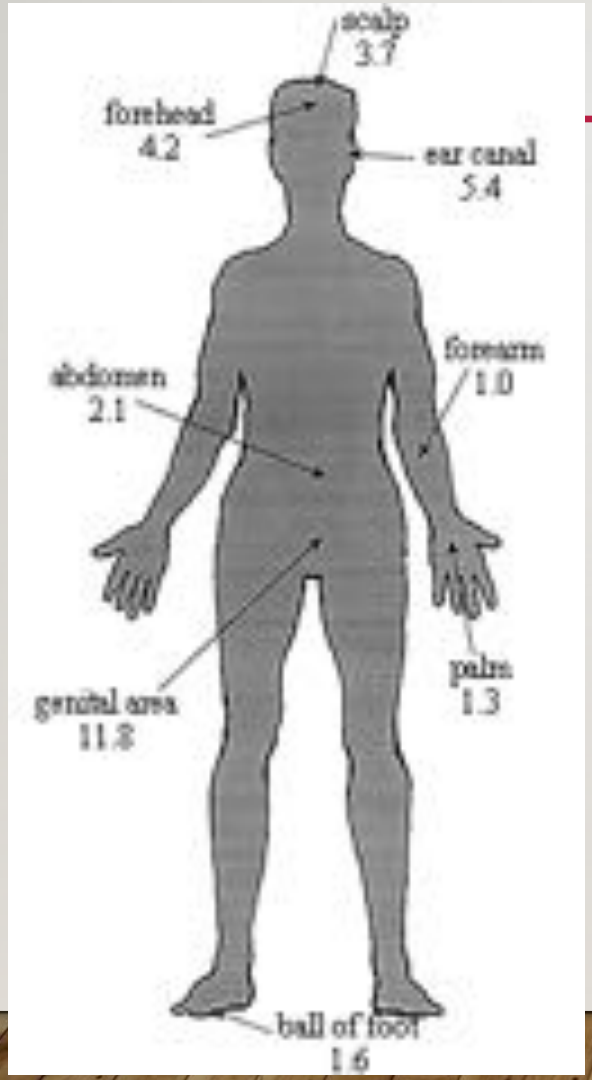
- **Call for help**
- **First aid**
- **Call physician/go to hospital**
- **Take chemical or labeling**
- **Call – Poison Control Center**

1-800-222-1222

***pesticide illness may be confused with heat stress, heat cramps, or plants poisoning**

Absorption through the skin is the most common route of poisoning of agricultural workers.

HOW PESTICIDES ENTER THE



- % Absorption
- 8.6
- 11.8
- 13.5
- 18.4
- 32.1
- 36.3
- 46.5
- 100.0

This exposure can be reduced by 99% simply by wearing chemical resistant gloves and a long-sleeve shirt.

PERSONAL PROTECTIVE EQUIPMENT (PPE):

- **Body Coverings** — Long-sleeved shirt, long pants, coveralls, liquid proof apron
- **Gloves – neoprene or natural rubber**
- **Boots – neoprene or natural rubber**
- **Goggles or face shield**
- **Hat**
- **Respirators**
- **Always Read the Label for Proper PPE**

PERSONAL PROTECTIVE EQUIPMENT (PPE): GLOVES

Waterproof or chemical resistant gloves

Never wear leather!

Natural Rubber

Always Read the Label for Proper PPE

PPE: RESPIRATORS

- **Dust/Mist (MSHA/NIOSH TC-21C)**
- **Reduces exposure to various dusts and mists.**
- **Label will specify type of respirator.**

Always Read the Label for Proper PPE

MIXING AND LOADING

The potential for human exposure is greatest during mixing/loading

Wear the Correct PPE!

KEEP OUT OF MOUTH

- **Never mouth siphon**
- **Use soft brush to unclog nozzles**
- **Keep in original container**
- **No eating, smoking, etc. until you have thoroughly cleaned up**

CHANGING OR CLEANING NOZZLES

CLEANING NOZZLES

WASHING AND BATHING

Shower or bathe daily after using pesticides.

Wash hands before touching anything that goes into mouth.

Do not touch face or genitals before washing hands.

Do not hug children with pesticides on your clothing or body

THE LABEL IS THE LAW

DO NOT APPLY ANY PESTICIDE IN A MANNER NOT SPECIFICALLY LISTED ON THE LABEL!

SAY GOODBYE TO YOUR PLANET EARTH MYSPACERS JAMIE ELLIS IS TAKING YOUR EARTH TO ANOTHER GALAZY .COULD THIS BE THE END OF PLANET EARTH WATCH THIS SPACE

THE END