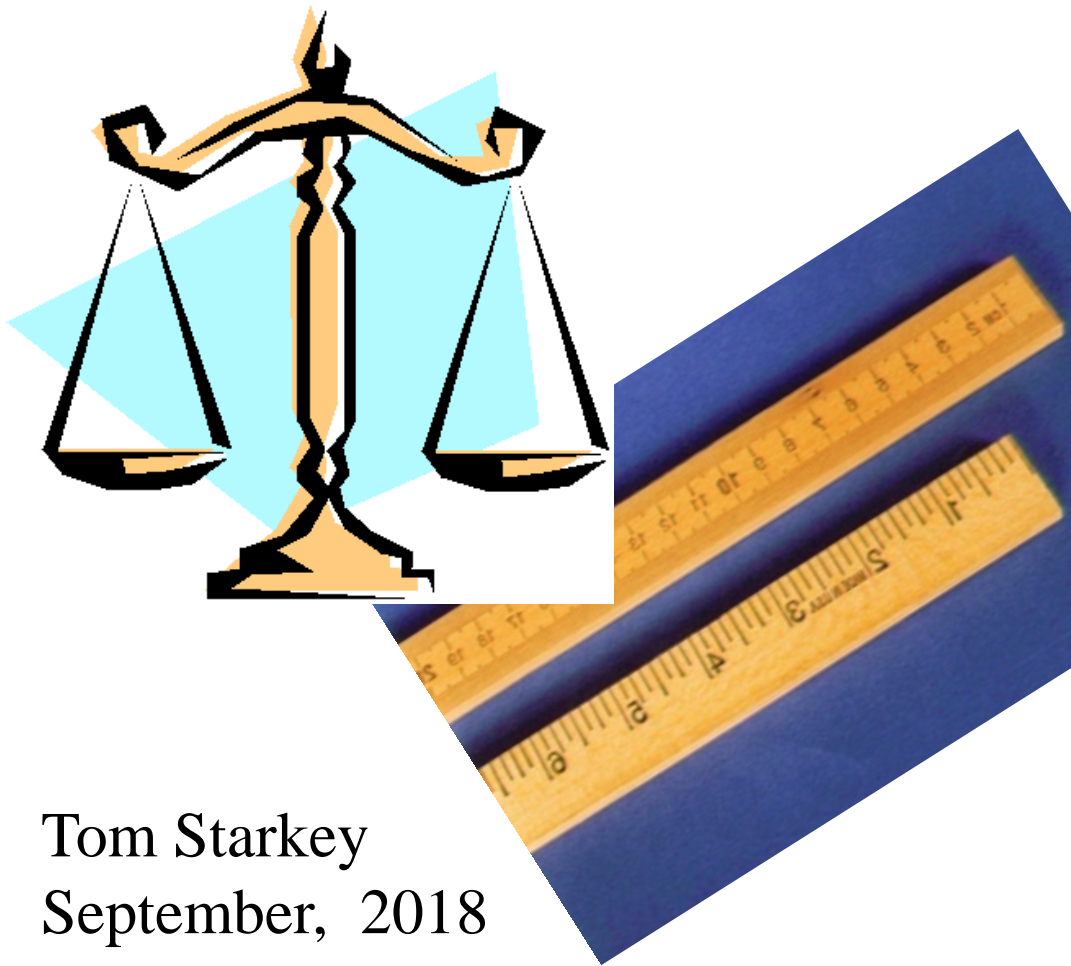


# Weight, Measures, Calibration & Safety Issues



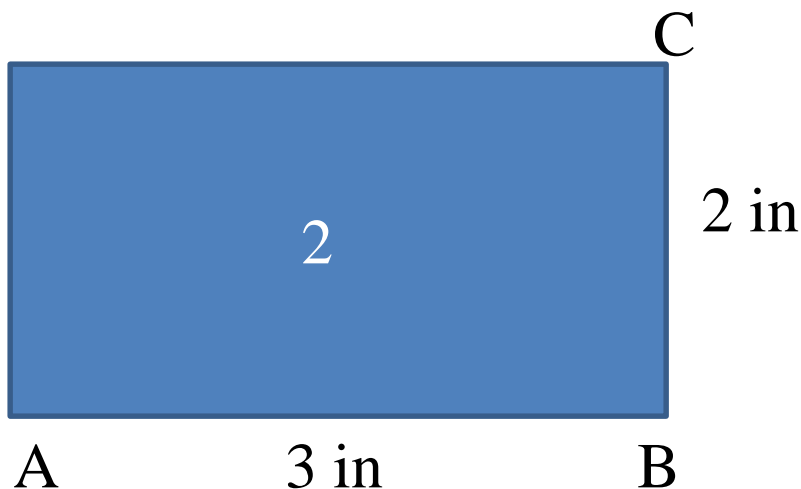
Tom Starkey  
September, 2018

# Weight and Measures

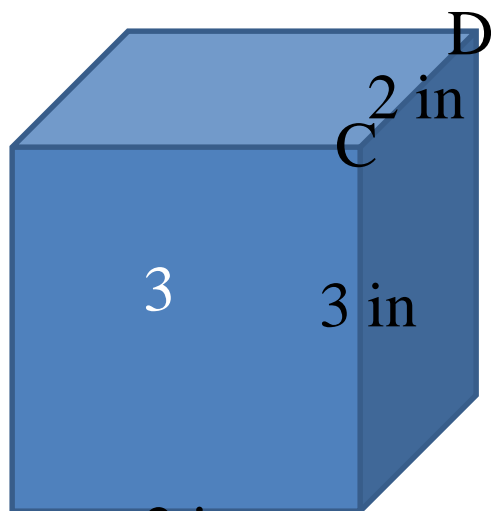
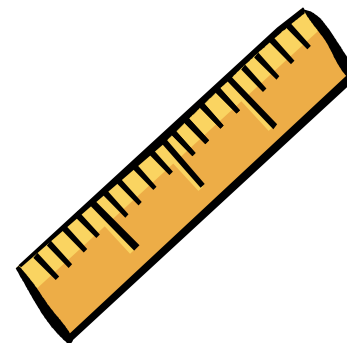
- **Length**: the distance A to B (or AB)
- **Area**: the product of “distance” in two dimensions = distance (AB) x (BC) for squares or rectangles
- **Volume**: the product of “distance” in 3 dimensions (AB)(BC)(CD)
- **Weight**: the gravitation attraction of a defined volume. Mass vs. Weight is moot for earth surface nurseries



A 2 in B



A 3 in B



A 2 in B

# Two types of measuring units are used

- Metric
- Imperial

# Imperial units - problematic & ambiguous

❖ barleycorn

❖ digit

❖ finger

❖ hand 😊

❖ inch

❖ nail

❖ palm

❖ shaftment

❖ span

❖ foot 😊

❖ cubit

❖ yard 😊

❖ ell

❖ fathom

❖ rod

❖ chain 😊

❖ furlong

❖ mile 😊

❖ league

❖ perch

❖ acre 😊

❖ rood

❖ carucate

❖ bovat

❖ virgate

❖ hide

❖ knight's fee

❖ hundred

❖ wapentake

❖ mouthful

❖ jigger 😊

❖ jack or jackpot

❖ gill

❖ cup 😊

❖ pint 😊

❖ quart 😊

❖ pottle 😊

❖ gallon

❖ peck

❖ kenning

❖ cask, strike, or  
coomb

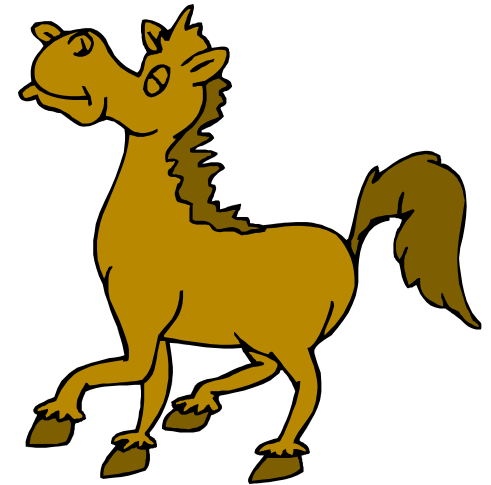
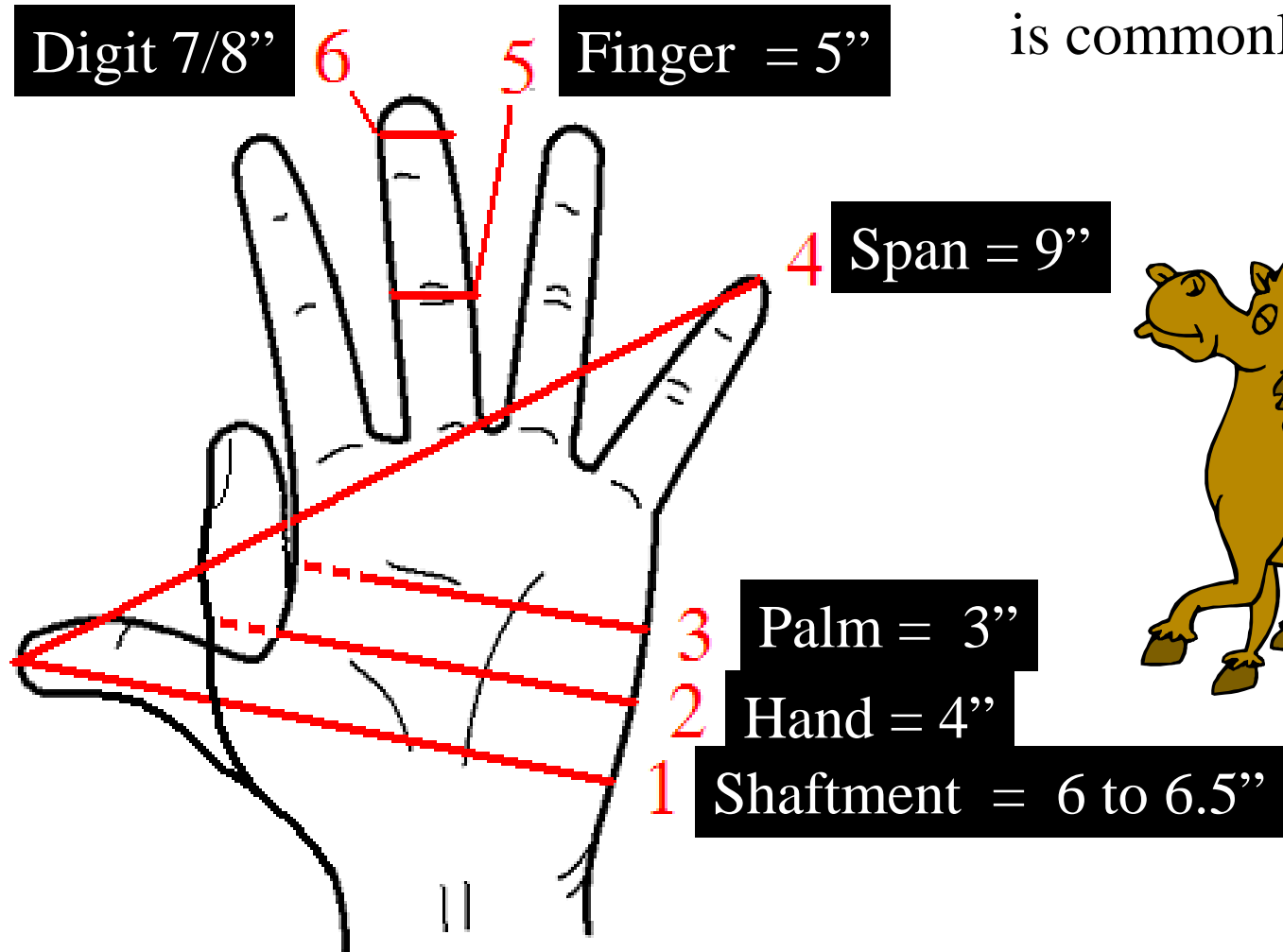
❖ barrel

❖ hogshead

❖ butt or Pipe

❖ tun

Which of these units  
is commonly used today?



# Imperial units - problematic & ambiguous

❖ barleycorn	❖ foot	❖ perch	❖ Gill
❖ digit	❖ cubit	❖ acre	❖ Cup
❖ finger	❖ yard	❖ rood	❖ Pint
❖ hand	❖ ell	❖ carucate	❖ Quart
❖ inch	❖ fathom	❖ bovat	❖ Pottle
❖ nail	❖ rod	❖ virgate	❖ Gallon
❖ palm	❖ chain	❖ hide	❖ Peck
❖ shaftment	❖ furlong	❖ knight's fee	❖ Kenning
❖ span	❖ mile	❖ hundred	❖ Cask, Strike, or Coomb
	❖ league	❖ wapentake	❖ Barrel
		❖ Mouthful	❖ Hogshead
		❖ Jigger	❖ Butt or Pipe
		❖ Jack or Jackpot	❖ Tun
		❖	❖

# Metric Units - easy to learn & understand & logical

☑ **meter** (common base unit)

☑ kilometer = 1000 metres

- hectometer = 100 metres

- decameter = 10 metres

- decimeter =  $\frac{1}{10}$  of a meter

☑ centimeter =  $\frac{1}{100}$  of a meter

☑ millimeter =  $\frac{1}{1000}$  of a meter

☑ **liter** (common base unit)

☑ kiloliter = 1000 litres

- hectoliter = 100 litres)

- decaliter = 10 litres

- deciliter =  $\frac{1}{10}$  of a litre

☑ centiliter =  $\frac{1}{100}$  of a liter

☑ milliliter =  $\frac{1}{1000}$  of a liter



# Mass/Weight

- Gram
- 1 kilogram = 1000 grams
- 1 decigram =  $1/10$  of a gram
- 1 centigram =  $1/100$  of a gram
- 1 milligram =  $1/1000$  of a gram

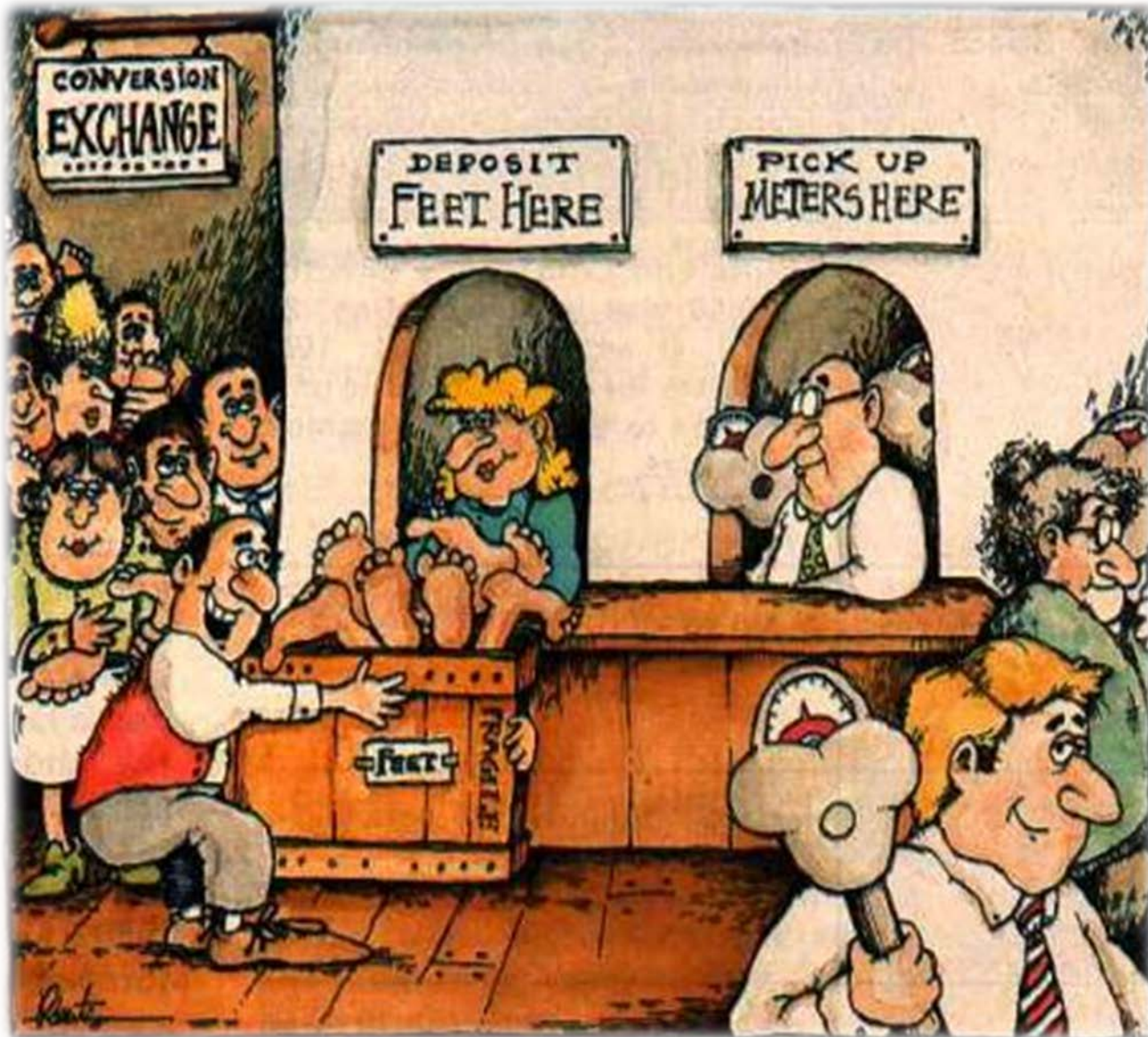
## Relationships

- 1 liter = 1 cubic decimeter  $\approx$  1 kilogram of water
- 1 milliliter = 1 cubic centimeter  $\approx$  1 gram of water
- 1 microliter = 1 cubic millimeter  $\approx$  1 milligram of water

# Metric or not

There are ~196 countries in the world,  
how many have not switched to the  
metric system?

If it were only this easy....



# Metric to Imperial (and vice versa)

<http://www.onlineconversion.com/>

- Inch = 2.54 cm
- Pound = 0.454 kg
- Gallon = 3.785 L
- Acre = 0.405 ha
- 1 cm = 0.3937 inches
- 1 kg = 2.205 lbs
- 1 L = 1.057 quarts
- 1 ha = 2.47 acres
- 1 lb/ac = 1.1 kg/ha
- 1 kg/ha = 0.90 lbs/ac

# So what do we use in the Nursery Cooperative?

**If your answer was Imperial and Metric  
you are correct.**

- Height
  - Nurseries – inches
  - Research – inches or cm
- Root Collar Diameter
  - Nurseries – mostly cm
  - Research - cm
- Applying pesticides
  - Imperial (lb /a)
- Calibrating Sprayers
  - Metric and Imperial

# Calibration

## measure – measure - measure

- **No. 1 = Quantity and Distribution per ac**
- **Most nurserymen know how many gal/ac their favorite sprayer puts out.**
  - **At least they do as of the last time they calibrated**
- **The variability between nozzles is more likely to be overlooked as is the effect of boom height on distribution.**

# What is Calibration?

- The process of measuring application rates of your sprayer based on:
  1. Tractor speed
  2. Sprayer pressure
  3. Nozzle size/typeCombination of all three

How Often? Several times during season or when you change chemicals

# Why Calibrate your Sprayer?

- It insures proper application rates of pesticides.
- No or improper calibration?
  - Apply too little pesticide
  - Apply too much pesticide
  - Lack of pest control
  - Damage to crops
  - Excessive costs
  - Harm to operator & environment.



## But, before you calibrate...

- Clean tank – remove sand/dirt - abrasive to pump & nozzles.
- Fill tank with water.
- Clean suction and line strainers.
- Remove nozzles and strainers & end caps.
- Make sure nozzles are the same size and type.
- Run sprayer and flush boom

## But, before you calibrate...

- Reinstall nozzles and strainers – replace any visually defective ones.
- Replace end caps
- Run sprayer again with clean water & check for leaks.
- Adjust to operating pressure and run again.
- Collect water from each nozzle to be sure output is uniform.

# Three Ways to Calibrate a Sprayer

## ***Tank Refill Method #1***

- 1 - Measure 660 ft
- 2 - Determine the spray put out in that distance at the desired speed or RPM of tractor
- $\text{Gal/ac} = \frac{\text{gal used} \times 66}{\text{swath width in ft}}$

**Example: It took 10.5 gal to refill tank and the spray width is 30'.**

$$\text{GPA} = 10.5 \times 66/30 = 693/30 = 23.1 \text{ gallons/acre}$$

# Three Ways to Calibrate a Sprayer

## Tank Refill Method #2

- 1 - Fill tank and spray a known distance
- 2 - Measure amount to refill tank in Gal
- $\text{Gal/ac} = \frac{\text{gal used} \times 43,560}{\text{swath length} \times \text{width}}$

**Example:** It took 2.5 gal to refill tank and the spray width is 30' and tractor covered 150'.

$$\text{GPA} = (2.5 \times 43,560) / (150' \times 30') = 108,900 / 4,500$$

$$\text{GPA} = 24.2 \text{ gallons per acre}$$

# Three Ways to Calibrate a Sprayer

## The 1/128 acre Method

1. Measure the distance in inches between the nozzles.



**Calibration distance for each nozzle to spray 1/128 acre.**

Nozzle/row spacing (in.)	Travel distance (ft.)		Nozzle/row spacing (in.)	Travel distance (ft.)
18	227		30	136
20	204		32	127
22	185		34	120
24	170		36	113
26	157		38	107
28	146		40	102

# Three Ways to Calibrate a Sprayer

## **The 1/128 acre Method**

- 2. Measure off the appropriate distance in the field based on nozzle spacing.**
- 3. Time and record speed to cover that distance. (ex . To travel 170' it took 30 sec)**
- 4. Park sprayer. Set pressure and pump speed to setting you plan to use in field.**
- 5. With tractor parked and sprayer running, collect water from several nozzles for the number of seconds it took you to drive the marked distance.**

# Three Ways to Calibrate a Sprayer

## The 1/128 acre Method

**6. Calculate the average output per nozzle.**

**7. The ounces per nozzle = gallons/acre**

Example: Nozzle distance = 24", Course length = 170'

It took 30 sec to drive course at sprayer speed

The average amount of water collected from several nozzle = 12 ounces in 30 sec.

Therefore the sprayer is applying 12 gallons/acre

# Ingredients per Acre

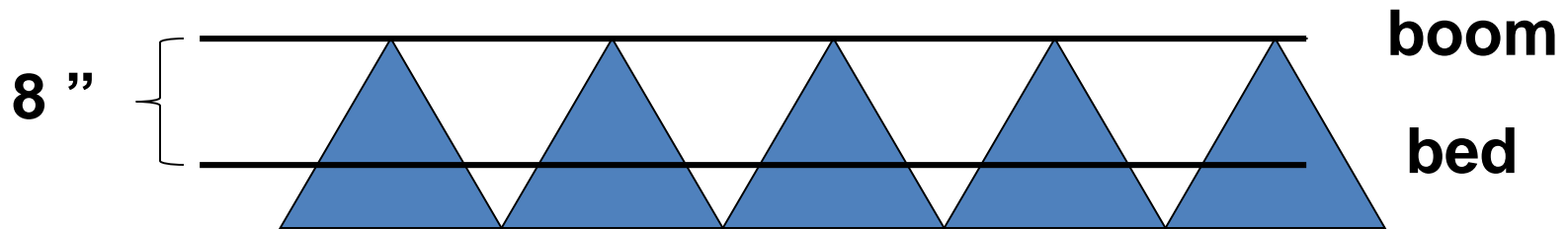
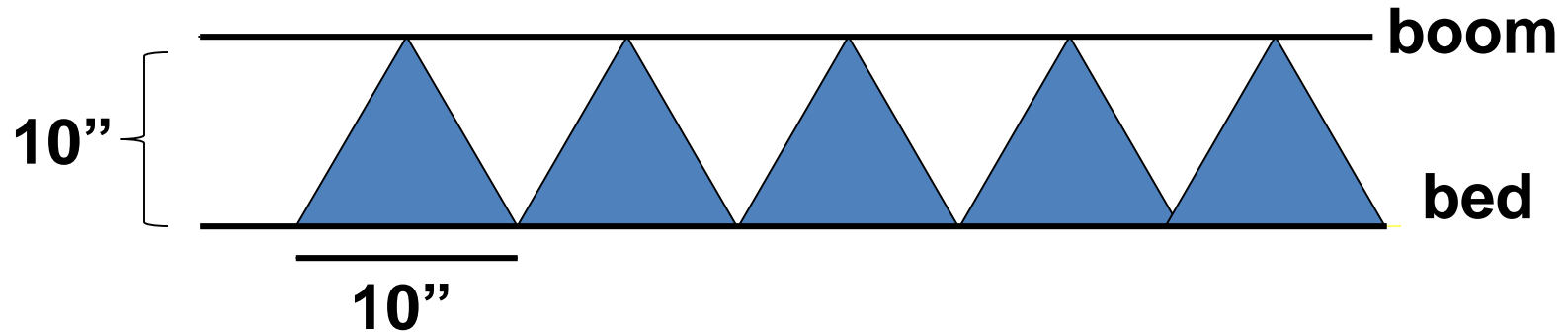
- You have determined the gal/ac that your spray-rig delivers to be “X gal/a”.
- You want to spray 2 lbs product / acre
- Just make sure that for every “X” gallons of spray there is 2 lbs of the product you want in the sprayer.
- You calculated your sprayer is spraying 12 gal/a. If you are going to spray 2 acres, you need 24 gal of water in the sprayer + 4 lbs of product.



# Spray the nursery or just the bed surface?

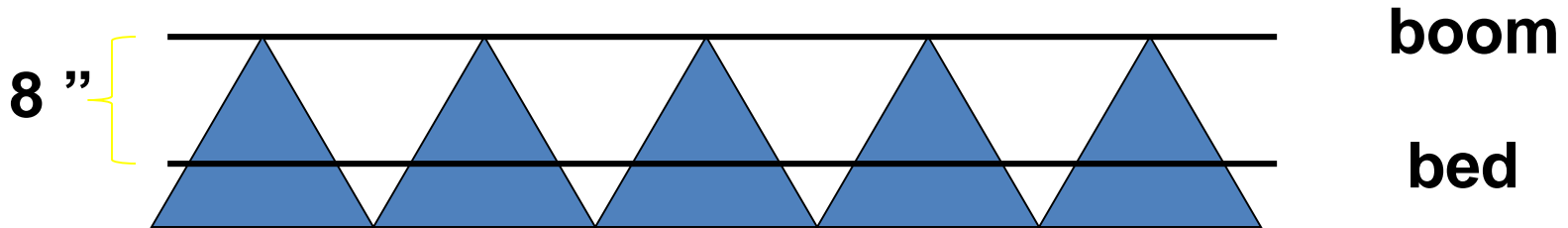
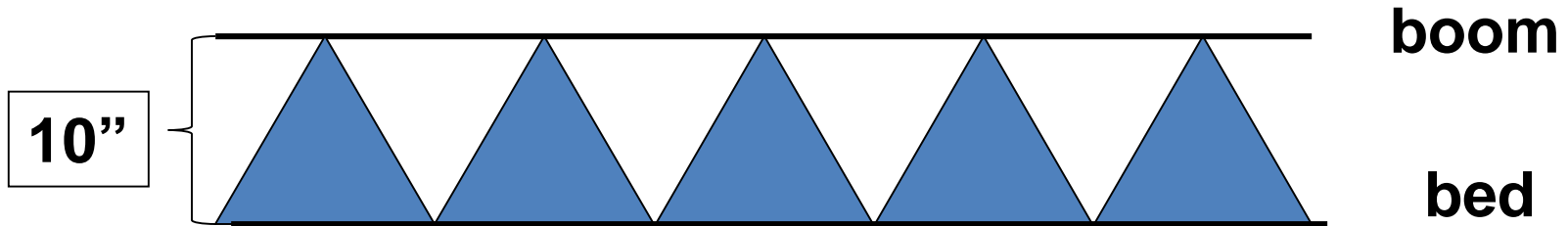
- **Some products should be applied to bed surface (fertilizer, most insecticides and fungicides) and some to beds, riser-lines and tractor paths (fumigants, herbicides).**
- **In most nurseries risers are 58' apart with nine, 4 ft-wide beds between. So bed surface is 36/58 or about 62% of each ac.**

# Boom Height



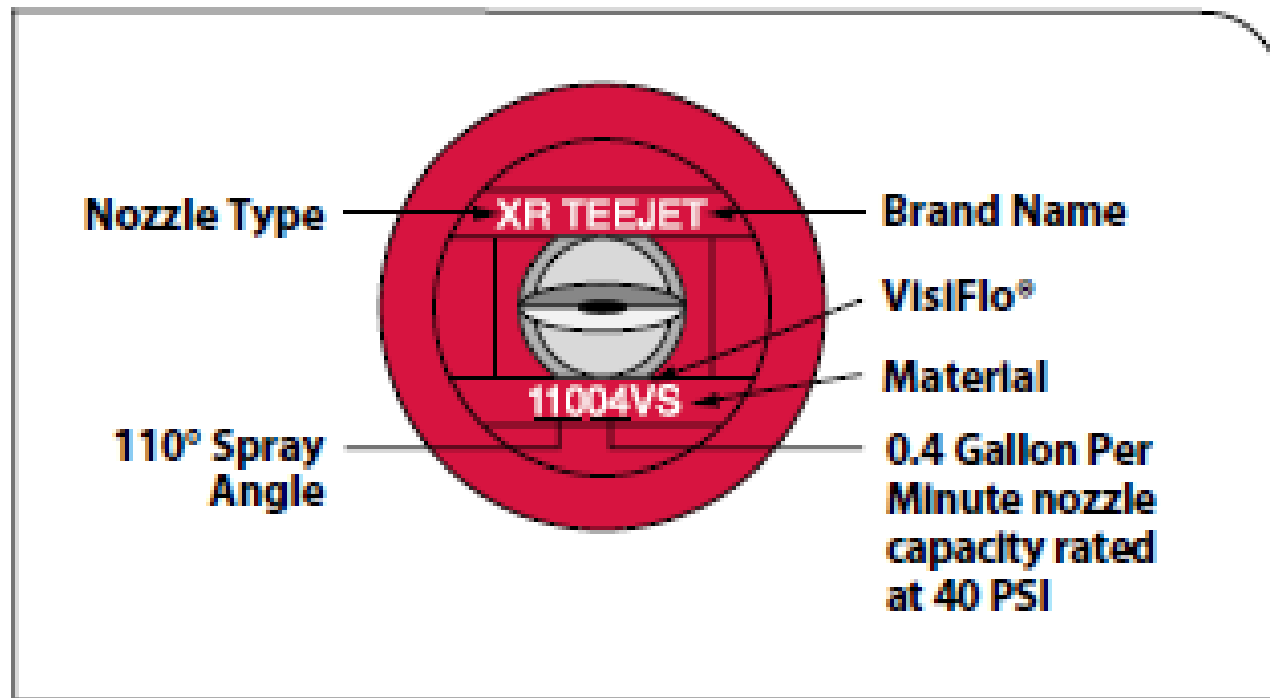
If the 10" boom delivers 100 gal / ac  
what does the 8" deliver?

# Boom Height

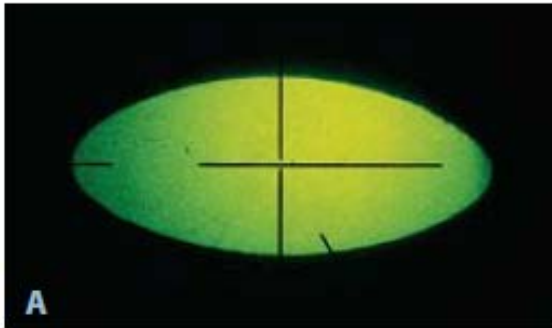


- The top figure covers 50'' of bed and the lower covers 40'' so it treats with 20% more concentrated product per acre.
- Where 10'' put out 100 gal/ac, 8'' puts out 120 gal/ac.

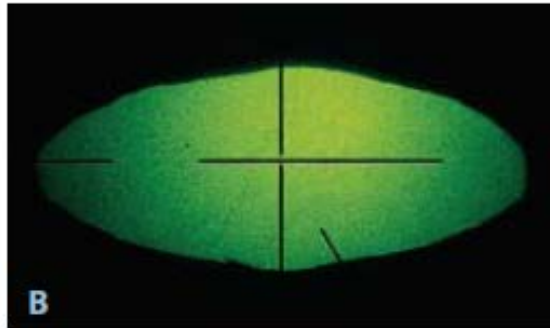
# How do I know if all the nozzles are the same type?



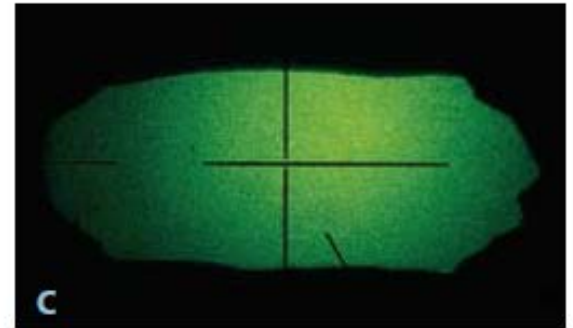
# Nozzle Problems



New



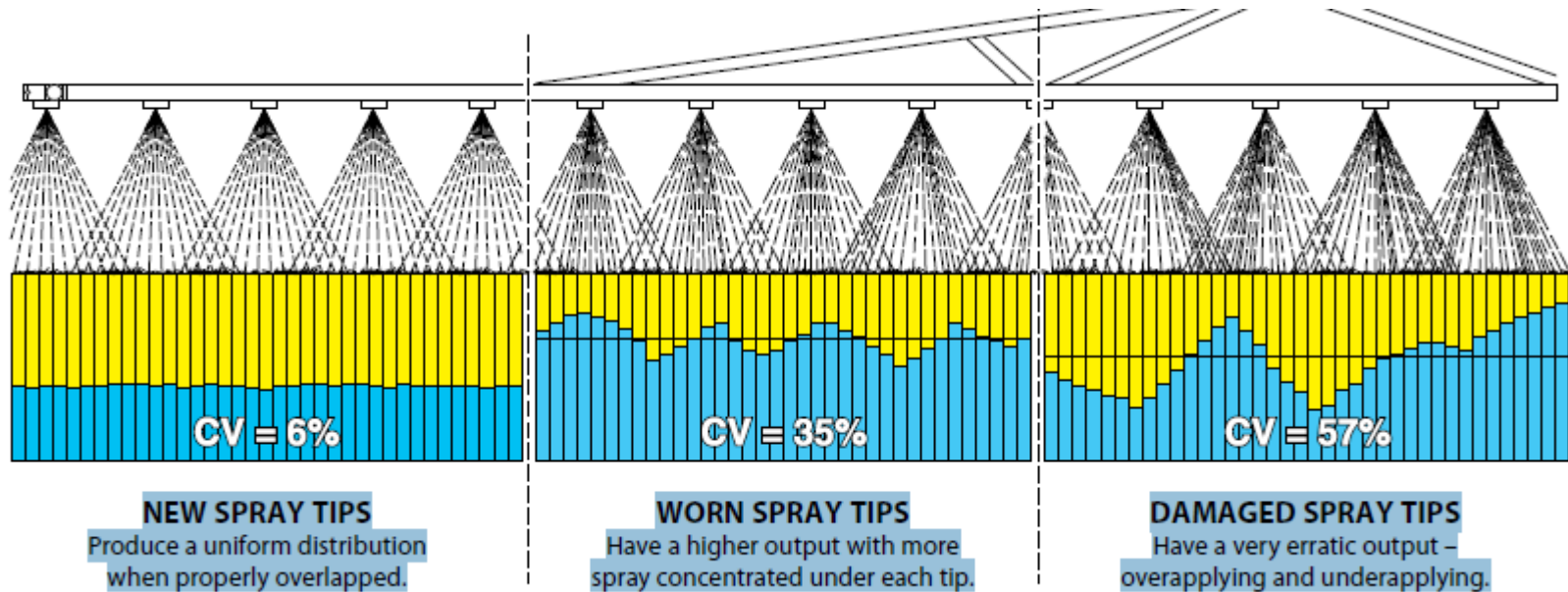
Worn



Damaged



# Worn Nozzles



# Pressure

- Increasing the pressure 4x doubles the flow rate.
- Higher pressure decreases droplet size and increases drift potential
- Higher pressure increases orifice wear.
- Changing pressure changes spray angle and coverage
- Use a constant pressure & record it!

# Worker Protection or Applicator Safety Issues

- Active Ingredient - ai's
- Personal Protective Equipment - PPE
- LD 50's
- Signal Words
- Re-entry Interval – REI
- Restrictive Use Pesticide





# Worker Protection or Applicator Safety Issues

“Familiarity  
breeds  
contempt”

Aesop - 600 BC



# Worker Protection or Applicator Safety Issues

- Restrictive Use Pesticide – Indicates that the pesticide is for retail sale and application is to be done only by certified applicators or persons under direct supervision by a certified applicator.
- Some of the pesticides used are both restrictive & non-restrictive. Designation will be listed on the LABEL and you must know the difference.

**VALENT**  
**COBRA**  
HERBICIDE

Active Ingredient By Wt.  
\*Lactofen ..... 23.2%  
Other Ingredients ..... 76.8%  
1-(carboethoxy) ethyl 5-[2-chloro-4-(trifluoromethyl)phenoxy]-2-nitrobenzoate

Contains 2 lbs. active ingredient per gallon.

Do not apply this product through any type of irrigation system.

**KEEP OUT OF REACH OF CHILDREN**

**DAÑERO — 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 & DOMESTIC ANIMALS  
**DANGER**  
Corrosive. Causes skin burns and irreversible eye damage. Harmful if swallowed, inhaled or absorbed through skin. Do not get in eyes or on skin or clothing. Avoid breathing vapor or spray mist.

This product contains lactofen, which has been determined to cause tumors in laboratory animals (mouse, rat). Risks can be reduced by closely following use directions and precautions, and by wearing the protective clothing specified elsewhere on this label.

**STATEMENT OF PRACTICAL TREATMENT**

If in eyes: Flush with plenty of water for at least 15 minutes. Get medical attention immediately.

If swallowed: DO NOT INDUCE VOMITING. Drink promptly a large quantity of milk, egg whites, gelatin solution, or if these are not available, large quantities of water. Avoid alcohol. Get medical attention immediately.

If on skin: Wash with plenty of soap and water. Get medical attention.

If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

Note to Physicians: Emergency Information - call 1-800-892-0099.

**PERSONAL PROTECTIVE EQUIPMENT (PPE):**  
Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category G on an EPA chemical resistance category selection chart.

**Applicators and other handlers must wear:** coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, such as Barrier Laminate or Viton ≥14 mils, chemical-resistant footwear plus socks, protective eyewear, chemical-resistant headgear for overhead exposure, and chemical-resistant apron when cleaning equipment, mixing or loading.

**Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.**

**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.

**ENVIRONMENTAL HAZARDS**  
This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water by cleaning of equipment or disposal of waste. Do not apply when weather conditions favor drift from target area.

**PHYSICAL OR CHEMICAL HAZARDS**  
Do not use or store near heat or open flame.

**DIRECTIONS FOR USE**  
It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

**READ ENTIRE LABEL AND PAMPHLET. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.**

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

**AGRICULTURAL USE REQUIREMENTS**  
Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water, is: coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, such as Barrier Laminate or Viton ≥14 mils, chemical-resistant footwear plus socks, protective eyewear, and chemical-resistant headgear for overhead exposure.

COBRA Herbicide

Page 1

**Specimen Label**

**Dow AgroSciences**

**GoalTender**

**Herbicide**

™Trademark of Dow AgroSciences LLC

**Use Directions For:** artichokes (globe), broccoli/cabbage/cauliflower, cacao, citrus (nonbearing), coffee, conifer (seedbeds, transplants, container stock) and selected deciduous trees, cotton, cottonwood, eucalyptus, fallow bed, (cotton/soybeans), garbanzo beans, garlic, guava (Hawaii only), horseradish, jojoba, mint, onions, onions grown for seed, papaya (Hawaii only), taro, treefruit/nut/wine

Active Ingredient  
oxyfluorfen: 2-chloro-1-(3-ethoxy-4-nitrophenoxy)-4-(trifluoromethyl) ..... 41%  
Inert Ingredients ..... 59%  
Total ..... 100%

Contains 4 pounds active ingredient per gallon.

**Shake Well Before Using**

EPA Reg. No. 261-19-947

**Keep Out of Reach of Children**

**CAUTION PRECAUCION**  
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**  
Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin or clothing. Wash thoroughly with soap and water after handling.

**Personal Protective Equipment (PPE):**  
Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection chart.

**Applicators and other handlers must wear:**

- Coveralls over long-sleeved shirt and long pants
- Chemical-resistant footwear plus socks
- Chemical-resistant gloves made of any waterproof material (≥14 mils) such as: Barrier Laminate, Butyl Rubber, Nitrile Rubber, Neoprene Rubber, Natural Rubber, Polyethylene, Polyvinyl Chloride (PVC), or Viton
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing or loading

**Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.**

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**User Safety Recommendations**  
Users should:  
• Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.  
• Remove contaminated clothing and wash clothing before reuse.

**Environmental Hazards**  
Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. This product is highly toxic to aquatic invertebrates, aquatic plants, wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water or wetland area. Do not apply when weather conditions favor drift or erosion from target areas. Runoff may be hazardous to aquatic organisms in neighboring areas.

**Notice:** Read the entire label. Use only according to label directions. Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

**Agricultural Chemical:** Do not ship or store with food, feed, drugs or clothing.

**Directions for Use**  
It is a violation of Federal law to use this product in a manner inconsistent with its labeling.  
Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

**Label - The legal document between the Producer, the EPA and the User**

# Worker Protection or Applicator Safety Issues

Active Ingredient - ai's

The amount in % of the actual compound that is responsible for the pest control.

The amount of ai per acre will change with the pesticide used. Even the same chemical may have different ai's.



**READ and UNDERSTAND the LABEL!**

# Worker Protection or Applicator Safety Issues

Formulations: Pesticides come in different forms and/or carriers. This determines how they can be applied.

Emulsifiable Concentrates (EC): non soluble in water, but are dissolved in non-polar liquids (emulsifiers) that can be suspended in water. Some emulsifiers can be phytotoxic.

Wettable Powder (WP)

Soluble Powder (SP)

Dusts (D)

Granular (G)



# Worker Protection or Applicator Safety Issues

- LD 50's Indicates the lethal dose of the pesticide in milligrams per kilogram (mg/kg) of test animal that resulted in the death of 50% of test animals. Can be either dermal or oral.
- The smaller the number, the more dangerous the pesticide.
- Know your LD 50 level!



**LD 50's    mg/kg    (1000 mg = 1 g)**

<b>Salt</b>	<b>3,750</b>	<b>Bayleton</b>	<b>1000</b>
<b>Sucrose</b>	<b>29,700</b>	<b>Glyphosate</b>	<b>10,000</b>
<b>Nicotine</b>	<b>50</b>	<b>Asana</b>	<b>325</b>
<b>Alcohol</b>	<b>5600</b>	<b>Chloropicrin</b>	<b>250</b>
<b>Theobromine</b>	<b>50</b>	<b>Goal</b>	<b>10,000</b>
<b>Vinegar</b>	<b>3300</b>	<b>Thiram</b>	<b>5000</b>
<b>DEET</b>	<b>2200</b>	<b>Diazinon</b>	<b>350</b>
<b>Caffeine</b>	<b>200</b>	<b>Stinger</b>	<b>5000</b>
<b>Aspirin</b>	<b>1240</b>	<b>Reflex</b>	<b>8000</b>
<b>Gasoline</b>	<b>4300</b>	<b>Manage</b>	<b>2600</b>

# Worker Protection or Applicator Safety Issues

- Signal Words: Gives an insight into the toxicity of the product. Will be **PROMINENTLY** displayed on the product label.

DANGER = very toxic, LD 50s = 0-50 mg/kg

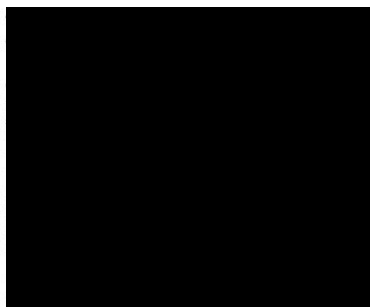
WARNING = moderately toxic, LD 50s = 50-500 mg/kg

CAUTION = slightly toxic, LD 50s = 505-5000 mg/kg





# Test your recall – what were the signal words?



## ANGER

Corrosive. Causes skin burns and irreversible eye damage. Harmful if swallowed, inhaled or absorbed through skin. Do not get in eyes or on skin or clothing. Avoid breathing vapor or spray mist.

This product contains lactofen, which has been determined to cause tumors in laboratory animals (mouse, rat). Risks can be reduced by closely following use directions and precautions, and by wearing the protective clothing specified elsewhere on this label.

### STATEMENT OF PRACTICAL TREATMENT

- If in eyes: Flush with plenty of water for at least 15 minutes. Get medical attention immediately.
- If swallowed: DO NOT INDUCE VOMITING. Drink promptly a large quantity of milk, egg whites, gelatin solution, or if these are not available, large quantities of water. Avoid alcohol. Get medical attention immediately.
- If on skin: Wash with plenty of soap and water. Get medical attention.
- If inhaled: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

Note to Physicians: Emergency Information - call 1-800-892-0099.

### PERSONAL PROTECTIVE EQUIPMENT (PPE):

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category G on an EPA chemical resistance category selection chart.

Applicators and other handlers must wear: coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, such as Barrier Laminate or Viton  $\geq$  14 mils, chemical-resistant footwear plus socks, protective eyewear, chemical-resistant headgear for overhead exposure, and chemical-resistant apron when cleaning equipment, mixing or loading.

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

### 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.

### ENVIRONMENTAL HAZARDS

This pesticide is toxic to fish. Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Drift and runoff from treated areas may be hazardous to aquatic organisms in neighboring areas. Do not contaminate water by cleaning of equipment or disposal of waste. Do not apply when weather conditions favor drift from target area.

### PHYSICAL OR CHEMICAL HAZARDS

Do not use or store near heat or open flame.

### DIRECTIONS FOR USE

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

READ ENTIRE LABEL AND PAMPHLET. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

### AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification and emergency assistance. It also contains specific statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.

Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 12 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil or water, is: coveralls over long-sleeved shirt and long pants, chemical-resistant gloves, such as Barrier Laminate or Viton  $\geq$ 14 mils, chemical-resistant footwear plus socks, protective eyewear, and chemical-resistant headgear for overhead exposure.

## Specimen Label



Herbicide

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Use Directions For: artichokes (globe), broccoli/cabbage/cauliflower, cacao, citrus (nonbearing), coffee, conifer (seedbeds, transplants, container stock) and selected deciduous trees, cotton, cottonwood, eucalyptus, fallow bed, (cotton/soybeans), garbanzo beans, garlic, guava (Hawaii only), horseradish, jojoba, mint, onions, onions grown for seed, papaya (Hawaii only), taro, treefruit/nut/vine

### Applicators and other handlers must wear:

- Coveralls over long-sleeved shirt and long pants
- Chemical-resistant footwear plus socks
- Chemical-resistant gloves made of any waterproof material ( $>$ 14 mils) such as: Barrier Laminate, Butyl Rubber, Nitrile Rubber, Neoprene Rubber, Natural Rubber, Polyethylene, Polyvinyl Chloride (PVC), or Viton
- Chemical-resistant headgear for overhead exposure
- Chemical-resistant apron when cleaning equipment, mixing or loading

Discard clothing and other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them. Follow manufacturer's instructions for cleaning/ maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d) (4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

### User Safety Recommendations

Users should:

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.
- Remove contaminated clothing and wash clothing before reuse.

### Environmental Hazards

Do not apply directly to water, to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water by cleaning of equipment or disposal of equipment washwaters. This product is highly toxic to aquatic invertebrates, aquatic plants, wildlife and fish. Use with care when applying in areas frequented by wildlife or adjacent to any body of water or wetland area. Do not apply when weather conditions favor drift or erosion from target areas. Runoff may be hazardous to aquatic organisms in neighboring areas.

Notice: Read the entire label. Use only according to label directions.

Before using this product, read Warranty Disclaimer, Inherent Risks of Use, and Limitation of Remedies elsewhere on this label. If terms are unacceptable, return at once unopened.

In case of emergency endangering health or the environment involving this product, call 1-800-992-5994. If you wish to obtain additional product information, visit our web site at [www.dowagro.com](http://www.dowagro.com).

Agricultural Chemical: Do not ship or store with food, feeds, drugs or clothing.

### Precautionary Statements

Prolonged or frequently repeated skin contact may cause allergic reactions in some individuals. Avoid contact with skin or clothing. Wash thoroughly with soap and water after handling.

### Personal Protective Equipment (PPE):

Some materials that are chemical-resistant to this product are listed below. If you want more options, follow the instructions for category A on an EPA chemical resistance category selection chart.

### Directions for Use

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

Read all Directions for Use carefully before applying.

Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application. For any requirements specific to your state or tribe, consult the agency responsible for pesticide regulation.

# Worker Protection or Applicator Safety Issues

## Personal Protective Equipment - PPE

Each pesticide has listed the minimal amount of protective equipment that the applicator must wear to use the material. This is listed on the label and usually includes long-sleeved shirts, long pants, chemically resistant gloves, foot wear, protective eyewear, etc...



# Worker Protection or Applicator Safety Issues

- Re-entry Interval – REI

This is the time period between application and when non-protected workers can “re-enter” the treated field.

Depending upon the pesticide, this can be anywhere from 12 hours up to 72 hours for some compounds.

Treated fields need to be posted as such to keep uninformed personnel out of the area.



Category I, II & III = 48, 24, 12 hrs

# Work Safely!



# Thank You!

