



**PESTICIDE SAFETY
EDUCATION PROGRAM**

OSU Extension

PESTICIDE SAFETY

Charles Luper



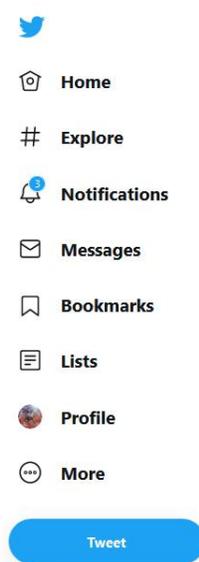
**PESTICIDE SAFETY
EDUCATION PROGRAM**

OSU Extension

Twitter/X

Twitter page for information and updates

- @OkstatePestEd



Twitter navigation sidebar with icons and labels: Home, Explore, Notifications, Messages, Bookmarks, Lists, Profile, More. A blue 'Tweet' button is at the bottom.



Profile of **Okstate Pesticide Education** (@OkstatePestEd) with 215 tweets. Bio: "Okstate Pesticide Education Program. Providing training for pesticide applicators in the state of Oklahoma." Location: Stillwater, OK. Website: pested.okstate.edu. Joined June 2018. 159 Following, 105 Followers.

Tweet from @OkstatePestEd · 20h: Master Gardener training in #Muskogee today. #okstate #extension #pested



Muskogee County OCES



Search Twitter bar. Recommendations section: "You might like" lists Kay County Okstate AG, Phil Mulder, and Tom A. Royer. "Trends for you" lists Warrick Dunn and #IntersectFest.

Pesticide Definition

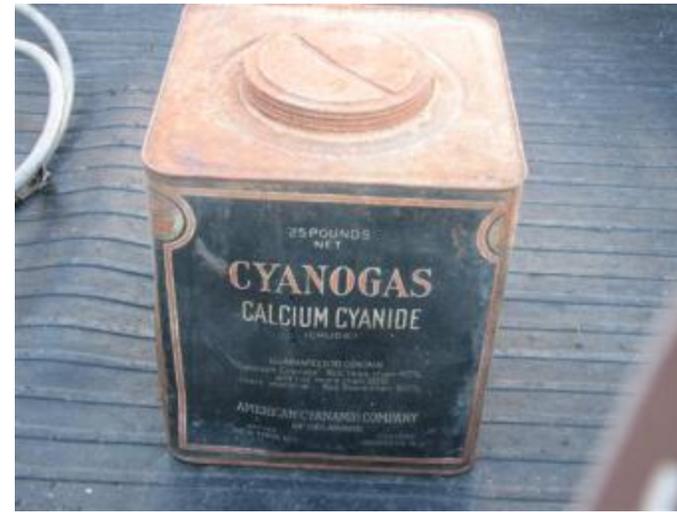
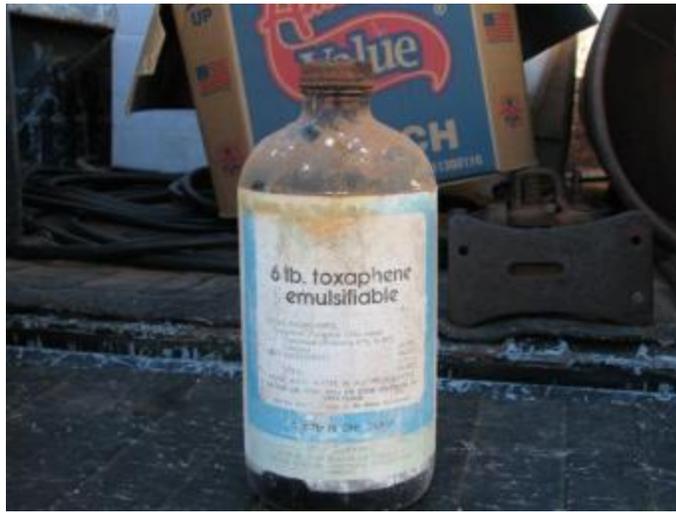
- A pesticide is any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest or functions as a plant regulator.

Pesticide Safety

- Treat Pesticides as a tool
- Caution must be taken when using
- Used correctly they can be useful
- Improper use could result in harm to person applying the pesticide or others

Use the Tools Correctly





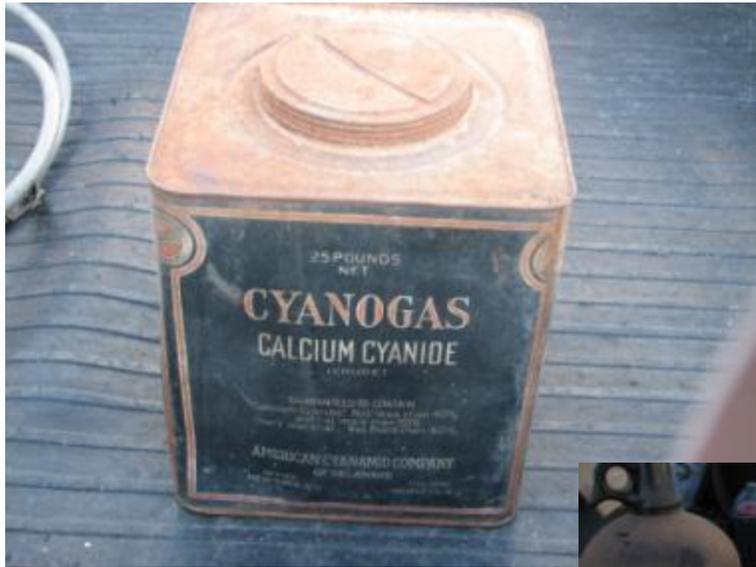
PESTICIDE

Where we used to be.

DDT

Arsenates

Aldrin, Dieldrin













Where We are At Now

- More Regulatory Control
- Safer Chemistry
- Better Equipment
- Better Application Techniques
- Better PPE and more frequent use of PPE
- Education



https://twitter.com/DRS_Jeremy/status/1565129146237595648

REGULATION

- Federal is by the Environmental Protection Agency - EPA (FIFRA)
- State is by the Oklahoma Department of Agriculture, Food & Forestry - ODAFF (Combined Pesticide Law & Rules)





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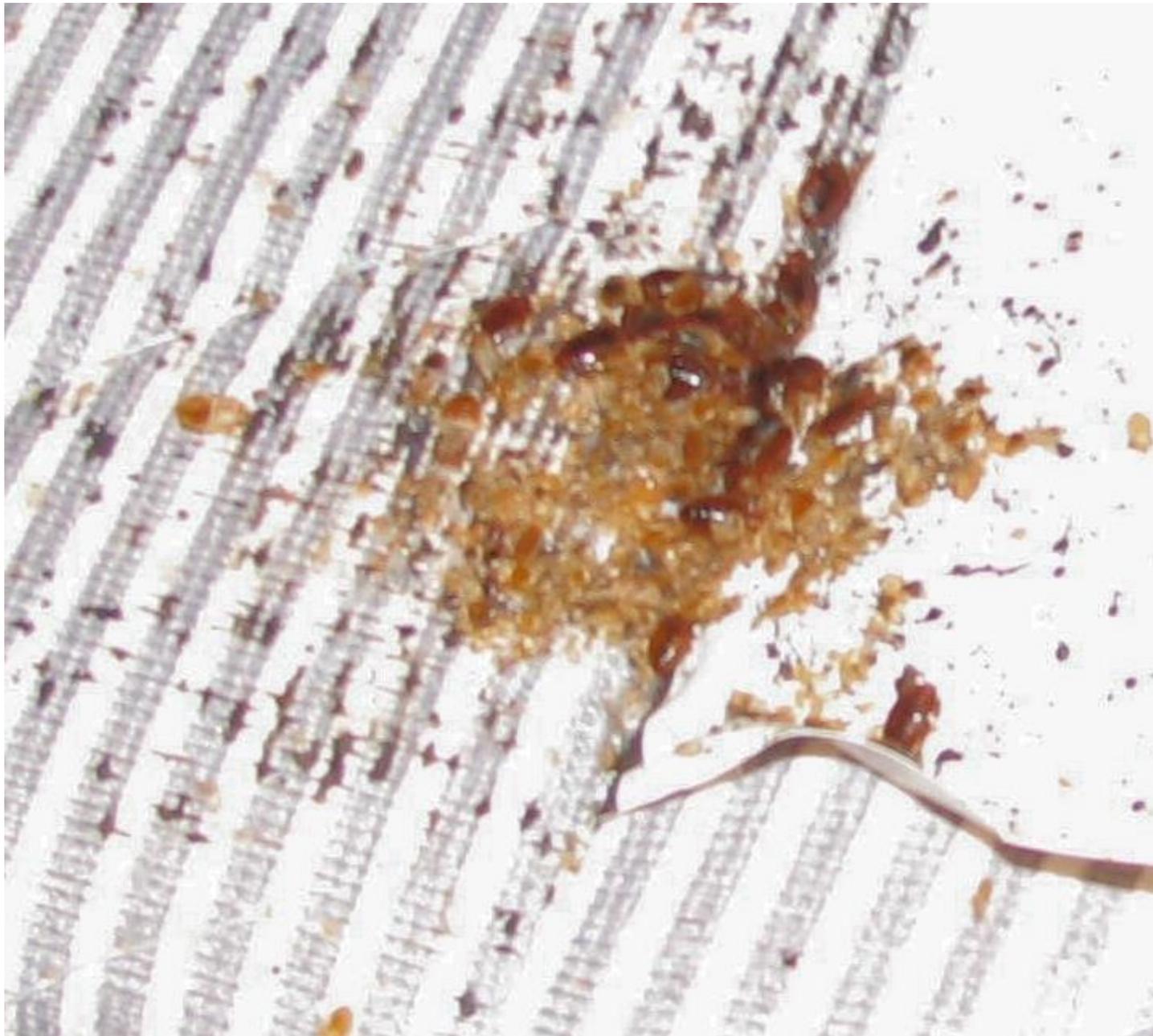
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PEST NAME + “CIDE”

Types of Pests











Really difficult Pests



TYPES of PESTICIDES

- Insecticide
- Herbicide
- Acaricide
- Molluscicide
- Rodenticide
- Avicide
- Fungicide
- Piscicide
- Nematicide
- Miticide
- Repellent
- Attractant
- Growth Regulator
- Bactericide

Pesticides

- By their very nature, most pesticides create some risk to humans, animals, or the environment because they are:
 - designed to kill
 - or otherwise adversely affect living organisms.

Pesticides

- At the same time, pesticides are useful to society because of their ability to:
 - kill potential disease-causing organisms
 - and control
 - insects
 - weeds
 - and other pests.



Organic Production

- Technically organic production can use some types of pesticides.
- Examples B.T. insecticides, some copper and sulfur pesticides.
- Dormant oils



Pesticides Used In Organic Production

ACTIVE INGREDIENT (A.I.)	TYPE*					BEE TOXICITY
Acetic acid (vinegar)				H	A	MEDIUM
Azadirachtin / neem oil	I	M				MEDIUM
<i>Bacillus amyloliquefaciens</i>			F			LOW
<i>Bacillus subtilis</i>			F			MEDIUM
<i>Bacillus thuringiensis</i> ssp. <i>aizawai</i>	I					MEDIUM - HIGH
<i>Bacillus thuringiensis</i> ssp. <i>kurstaki</i> / <i>israelensis</i>	I					LOW
<i>Beauveria bassiana</i>	I					MEDIUM-HIGH ^W
Bicarbonates (sodium / potassium)			F			LOW
Boric acid	I					LOW
<i>Burkholderia</i> spp. strain A396	I	M				LOW - MEDIUM
Cedar oil	I	M		R		LOW - MEDIUM
<i>Chromobacterium subtsugae</i>	I	M				LOW - MEDIUM
Cinnamaldehyde	I	M	F			LOW
Citrus oil (Limonene / D-limonene)	I			H		LOW
Coppers			F			LOW - MEDIUM
↳ Copper sulfate (CuSO ₄)			F			LOW - MEDIUM
↳ Copper sulfate + lime (Bordeaux mixture)			F			MEDIUM
Corn gluten				H		LOW
<i>Cydia pomonella</i> granulovirus	I					LOW
Diatomaceous earth	I	M				MEDIUM
Garlic, cottonseed, or clove oil	I	M	F	R		LOW - MEDIUM
Gibberellic acid					P	LOW - MEDIUM
<i>Gliocladium catenulatum</i>			F			LOW
Horticultural oil / narrow range oil	I	M	F			MEDIUM
Hydrogen dioxide, peroxyacetic acid			F			HIGH
Insecticidal soap	I	M	F			LOW - MEDIUM
<i>Isaria fumosorosea</i>	I	M				LOW - MEDIUM
Kaolin clay	I	M				LOW
Lime sulfur	I	M	F			LOW - MEDIUM
Pyrethrins	I	M				HIGH
<i>Pythium oligandrum</i>			F			LOW
<i>Reynoutria sachalinensis</i> extract			F			LOW
Rotenone	I	M				MEDIUM - HIGH
Ryania/Ryanodine	I					LOW - MEDIUM
Sabadilla (<i>Schoenocaulon officinale</i>)	I					LOW - MEDIUM
Spinosad	I	M				HIGH
<i>Streptomyces</i> spp.			F			LOW
Sulfur	I	M	F			LOW
Tea tree oil			F			LOW
<i>Trichoderma</i> spp.			F			LOW

- Source:
https://xerces.org/sites/default/files/publications/13-053_web-screen.pdf

Examples of What is But is Not a Pesticides

- Products which contain low-risk ingredients, such as:
 - Soybean oil
 - mint oil
 - etc., have been exempt from Federal registration requirements. (25b)
- However, State regulatory requirements may still apply.



IMPORTANT! READ BEFORE USE • Shake Well Before Use

Attach Sprayer

- Remove sprayer from bottle and extend hose.
- Open flip-cap on bottle.
- Insert hose and plug into flip-cap opening until it snaps into place.

Spray

- Adjust nozzle to stream or spray position.
- Point sprayer downward and squeeze trigger repeatedly until liquid is released.

After Use

- Turn sprayer nozzle to X (off) position. Do not unplug hose.
- Return sprayer to bottle. Sprayer will snap into place.

OPEN Resealable Label for Directions & Precautions

Indicaciones en español después de las de inglés

READ THE LABEL FIRST!

QUICK FACTS

- Kills Insects Around and Inside Your Home
- For Use Indoors & Outdoors
- Foaming Action Kills on Contact
- May Be Used Around Children and Pets

KILLS	Cockroaches (American, German, Oriental), spiders (cellar, black widow), ants (Argentine, carpenter, little black), fruit flies (common, dark-eyed), Japanese beetles (adults), house flies, bagworms, earwigs, house crickets, fleas, aphids, saw-toothed grain beetles, and red flour beetles.
WHERE TO USE	In and around homes including kitchens, bathrooms, laundry rooms, basements and garages.
WHEN TO USE	When insects first appear.

For questions or comments, call toll-free 1-877-BayerAG (1-877-229-3724).

<p>ACTIVE INGREDIENTS:</p> <p>Soybean Oil 3.00%</p> <p>Eugenol 0.25%</p> <p>OTHER INGREDIENTS 96.75%</p> <p>TOTAL 100.00%</p>	<p style="text-align: center;">FOR HOUSEHOLD USE</p> <p style="text-align: center;">This product is exempt from registration with the Federal Environmental Protection Agency under FIFRA section 25 (b).</p> <p style="text-align: center;">KEEP OUT OF REACH OF CHILDREN</p> <p style="text-align: center;">Other ingredients: Potassium laurate, Sodium benzoate, and Water</p>
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79918178 R.0

6 8 7 0 7 3 4 0 0 0 0 1 3

FPO

Natural Does Not Mean Safe



Watch Out for Marketing



PESTICIDE PRODUCT CLASSIFICATION

- Restricted Use Pesticide
- General Use Pesticide

RESTRICTED USE PESTICIDE (RUP)

RESTRICTED USE PESTICIDE

May Injure (Phytotoxic) Susceptible, Non-Target Plants. 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. Commercial certified applicators must also ensure that all persons involved in these activities are informed of the precautionary statements.



Grazon* P+D



General Use

- MOST PESTICIDES ARE GENERAL USE NOT RESTRICTED USE
- MANY IF NOT MOST HOMEOWNER PRODUCTS HAVE THE SAME AI AS PROFESSIONAL PRODUCTS
- DIFFERENCE IS CONCENTRATION AND MAYBE SOME OF THE WAYS USED

CERTIFICATION CATEGORIES

- Private Applicator
- Service Technician
- Agri Plant
- Ornamental & Turf
- Interiorscape
- Greenhouse - Nursery
- General Pest
- Structural Pest
- Fumigation
- Right-of-Way
- Demonstration & Research
- Bird & Predatory Animal

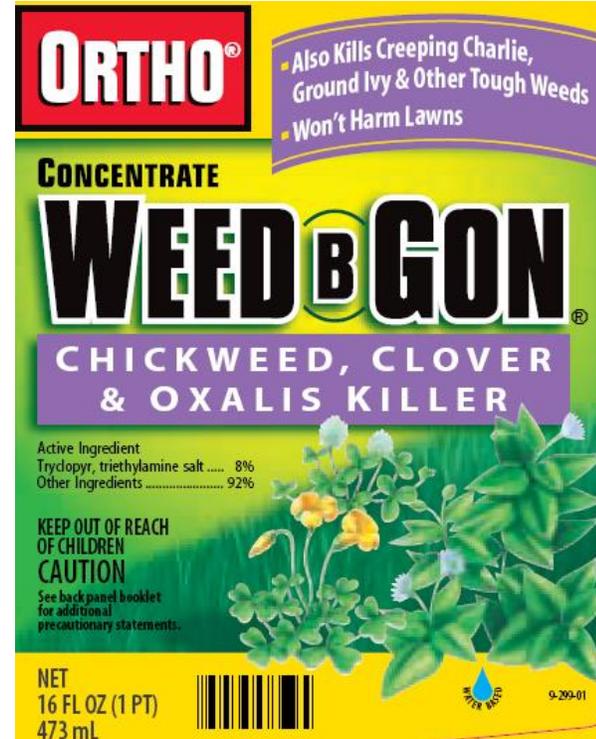
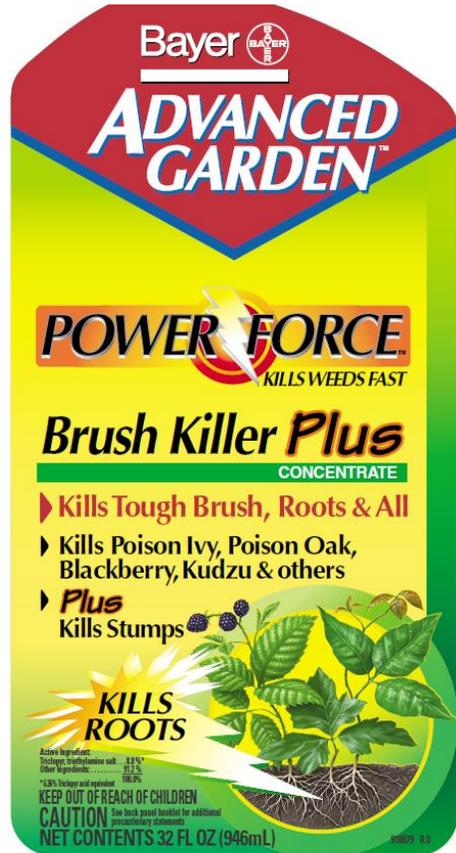




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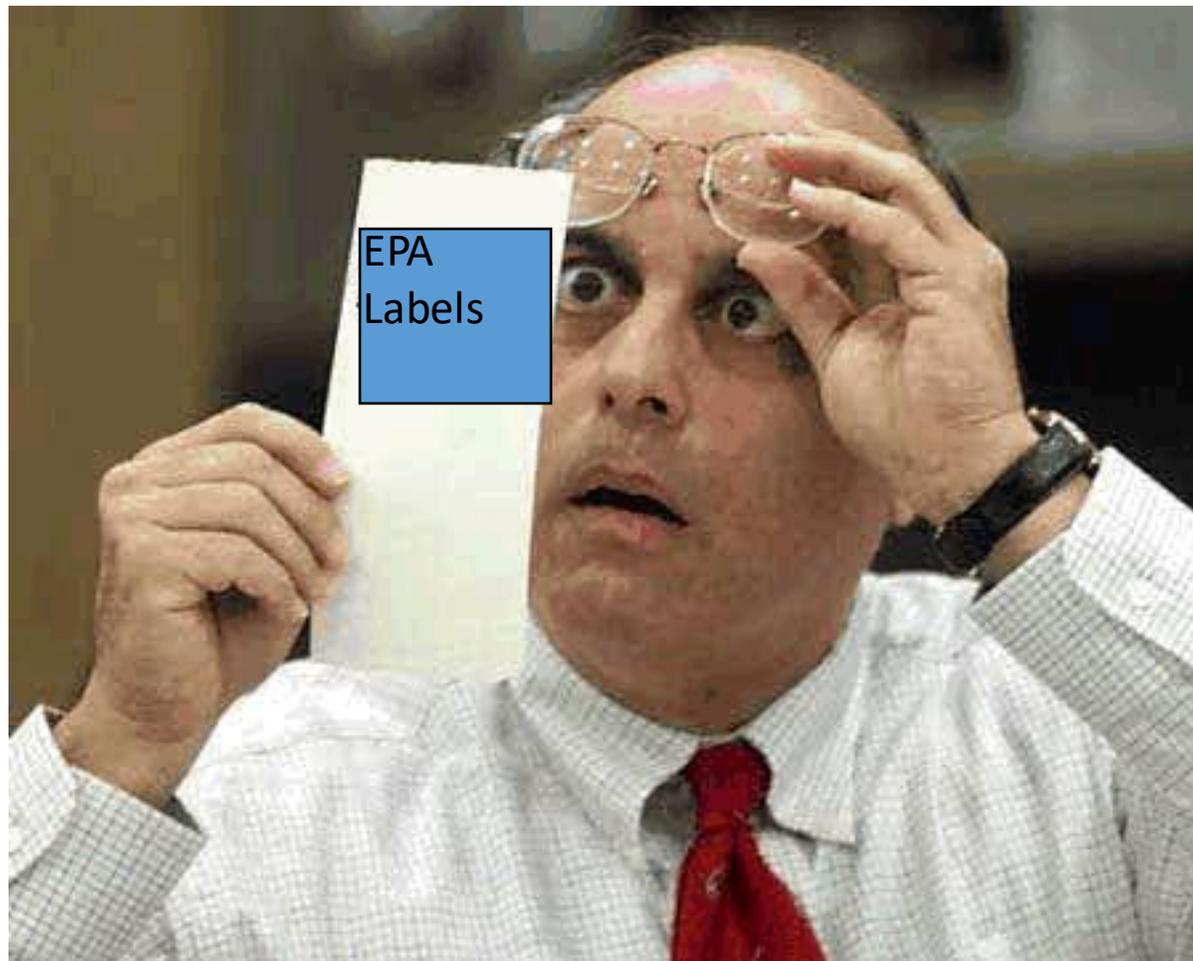
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Pesticide Labels



The pesticide label is the law!

How To Read a Label



AP

INFORMATION on LABELS

- Ingredient statement
- Name & address of registrant
- Brand or trade name
- Net weight or measure of content
- Classification - Restricted or non-classified
- Signal Word
- Registration & establishment numbers
- Directions for use
- Other information



Pesticide Labels

Type of Pesticide (usually listed on front panel)

- Insecticide
 - Fungicide
 - Herbicide
 - Algaecide
- Brand Names and





**PESTICIDE SAFETY
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INGREDIENT STATEMENT

2,3-O- diethyl, gotu47.5%

Inert 52.5%

Total 100%

Active Ingredient
 Tryclopypyr, triethylamine salt 8%
 Other Ingredients 92%

KILLS ROOTS

Active Ingredient:
 Triclopypyr, triethylamine salt . . . 8.8%*
 Other Ingredients: 91.2%
 * 6.36% Triclopypyr acid equivalent 100.0%

KEEP OUT OF REACH OF CHILDREN
CAUTION See back panel booklet for additional
 precautionary statements
NET CONTENTS 32 FL OZ (946mL)

Pesticide Labels

Registration Number

- Appears on most pesticide labels
- Indicates the pesticide has been approved by the federal government.

Establishment Number

- Identifies the facility that produced the product.
- Appears either on pesticide label or container



**PESTICIDE SAFETY
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EPA Registration Number

EPA Reg No xxx-xxx-xxxx

Company-product-Company

© Monsanto Company 1998

Manufactured for
The SOLARIS Group of Monsanto Company
P.O. Box 5008 San Ramon CA 94583-0808

Form O-299-01

EPA Reg. No. 239-2491

NOTICE: Research and testing have determined that the "Directions For Use" are appropriate for the proper use of Bayer Advanced Garden™ PowerForce™ Brush Killer Plus Concentrate under expected conditions. The Buyer assumes responsibility for lack of performance or safety if not used according to the directions.

Money Back Guarantee: If you are not satisfied with this product, we will gladly refund your original purchase price.

©2002 Bayer Advanced LLC
Bayer Advanced LLC
1500 Urban Center Drive
Birmingham, AL 35242

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EPA Reg. No. 72155-19
EPA Est. No. indicated by 2nd and 3rd digits
of the batch number on this package.
(75) = 5905-AR-01 (46) = 5905-IA-01 (63) = 070989-IA-001
(77) = 0709896-MO-001 (39) = 58996-MO-1

Made in USA

91008 R.O

Pesticide Labels

Directions for Use

- Instructions on how to use the pesticide
 - pests controlled
 - site the product can be applied to
 - proper equipment to use
 - rate of application
 - mixing directions
 - phytotoxicity



ORTHO® WEED-B-GON®
CHICKWEED, CLOVER & OXALIS KILLER

Special formula for control of tough lawn weeds. Weed-B-Gon Chickweed, Clover & Oxalis Killer kills weeds right down to the roots without harming lawns.

PRODUCT FACTS
Treats 3,200 sq ft (approx. size of 1 1/2 tennis courts)

KILLS WEEDS	Chickweed, Clover, Creeping Charlie, Ground Ivy, Oxalis, Speedwell (Veronica), Wild Violet & other tough lawn weeds
WHERE TO USE	ON LAWNS Bent, Buffalo, Fescues, Kentucky Blue, Rye & Zoysia
AMOUNT TO USE	1 fl oz (2 Tbs) / gal of water / 200 sq ft
	Questions, Comments or Medical Information call 1-800-225-2883 www.ortho.com

Specially formulated for residential use.

OPEN Resealable Label for Directions & Precautions

DIRECTIONS FOR USE

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

WEEDS CONTROLLED

Black Medic, Carolina Geranium, Chickweed (Common & Mouseear), Cinquefoil, Clover, Creeping Charlie, Dandelion, Evening Primrose, Florida Pusley, Ground Ivy, Ironweed, Lespedeza, MorningGlory (Bindweed), Oxalis, Pennywort, Plantains, Red Sorrel, Speedwell (Veronica), Spurge (Garden & Spotted), Thistle, Wild Onion, Wild Violet & Yellow Rocket

MIXING INSTRUCTIONS

Amount to Use: 1 fl oz (2 Tbs) per gallon of water for each 200 sq ft



When using Ortho® Dial 'n Spray®:

1. Set dial to 1 oz.
2. Add 6 fl oz (12 Tbs) to sprayer jar. **DO NOT** add water.
3. Spray evenly over 1,200 sq ft until jar is empty.

1 Tablespoon (Tbs) = 3 teaspoons (tsp)

1 fl oz = 2 Tbs

DIRECTIONS FOR USE

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

BEFORE YOU USE Read and follow directions when using:

- Bayer Advanced Garden™ PowerForce™ Brush Killer Plus will kill or injure all woody plants contacted. Certain warm season grasses may experience temporary yellowing when sprayed to excess.
 - If a desirable plant (other than grass) is accidentally sprayed, immediately rinse with plenty of water.
 - Apply when wind is calm.
 - To avoid tracking product onto desirable plants, (other than grasses) keep people and pets off treated areas until spray has dried.
- Do not apply to or around fruits or vegetables used for food.
- Measuring utensils such as measuring cups or measuring spoons should not be used for any food or drinking water purposes after use with this product.

HOW TO USE

- Determine amount of spray solution to prepare – See “How Much to Use”.
- Make up spray solution by following directions specific to your sprayer – See “Sprayer Types”.
- Adjust sprayer nozzle to a coarse spray. Spray the weeds you want to kill until thoroughly wet but not dripping.

TIPS

- Use a sheet of cardboard or plastic to protect desirable plants from accidental contact with the product.
- **To Kill Vines,**
For vines growing on desirable plants, cut the vine and treat as directed for stump removal.
- **To Kill Poison Ivy or Poison Oak,**
Contact with Poison Ivy or Poison Oak anytime of the year can cause an allergic reaction. Handle dead plants with rubber gloves. Dispose of plants and gloves in tightly sealed garbage bags.
- **To Kill Stumps,**
Completely cover freshly cut stump with undiluted product using a paintbrush. Do not reuse paintbrush for other uses. When discarding, wrap brush in newspaper and put in trash.

DIRECTIONS FOR USE (cont'd)

HOW MUCH TO USE

Brush, Vines, Woody Plants and Other Hard-to-Kill Weeds
Add 4 fl. oz. (1/2 Cup or 8 TBSP) to 1 gallon of water to treat up to 500 square feet.

Stumps

Use full strength. Do not dilute.

SPRAYER TYPES

PUMP-UP TANK SPRAYERS

1. Add the appropriate amounts of concentrate and water to the sprayer tank.
2. Close sprayer, shake well and pressurize.
3. Adjust nozzle to a coarse spray pattern and apply.
4. Occasionally re-pressurize the sprayer to maintain a good spray pattern.



DIAL-STYLE HOSE-END SPRAYERS

1. Fill sprayer jar with enough concentrate to cover plants to be treated.
2. Close sprayer and set dial.
3. Attach sprayer to hose and apply.
4. Pour any unused product back into this original container for future use.



CONCENTRATE PLUS WATER HOSE-END SPRAYERS

1. Pour concentrate into sprayer jar to the required ‘Fluid Ounce’ mark.
2. Add the appropriate amount of water to the ‘Gallons’ mark.
3. Replace sprayer top and shake well.
4. Attach sprayer to hose and apply.



FOR BEST RESULTS

- Apply when weeds are fully leafed out and actively growing.
- Rain or water 4 hours after application will not wash away effectiveness.
- Pump-up Tank Sprayers work best for spot treatments while Hose-end Sprayers work best for large areas.
- Certain hard-to-kill weeds may require a repeat application if regrowth occurs.

USE SITES

- Specific Area Where pesticide used.
- Must be listed on label to use on that area.
- Can be broad areas such as Lawns and vegetables gardens.
- Can get very specific such as Bermuda lawns and eggplant.



ORTHO® WEED-B-GON®
CHICKWEED, CLOVER & OXALIS KILLER

OPEN Resealable Label for Directions & Precautions

Special formula for control of tough lawn weeds. Weed-B-Gon Chickweed, Clover & Oxalis Killer kills weeds right down to the roots without harming lawns.

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KILLS WEEDS	Chickweed, Clover, Creeping Charlie, Ground Ivy, Oxalis, Speedwell (Veronica), Wild Violet & other tough lawn weeds 
WHERE TO USE	ON LAWNS  Bent, Buffalo, Fescues, Kentucky Blue, Rye & Zoysia
AMOUNT TO USE	1 fl oz (2 Tbs) / gal of water / 200 sq ft
	Questions, Comments or Medical Information call 1-800-225-2883 www.ortho.com

Specially formulated for residential use.



USE SITES

IMPORTANT

Not for use on Bahia, Bermuda, Centipede, Kikuyu or St. Augustine lawns. Not for use on or around fruits, vegetables or flowers. If an ornamental shrub or tree is in the lawn, keep spray off foliage and exposed roots.

Pesticide Labels

General Environmental Statements

- Reminders of common sense actions to follow to avoid contaminating the environment.

ENVIRONMENTAL HAZARDS

- Do not apply directly to water.
- Do not contaminate water when disposing of equipment washwaters or rinsate.

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Made in USA

910085 R.0

ENVIRONMENTAL HAZARDS: Do not apply directly to any body of water. Do not pour product or rinse water down any drain.

Pesticide Labels

Special Toxicity Statements

- **Included on the label of products known to be especially hazardous to wildlife.**
- **Examples:**
 - **This product is highly toxic to bees**
 - **This product is toxic to fish**
 - **This product is toxic to birds and other wildlife**



Pesticide Labels

Physical or Chemical Hazards

- Not on all labels
- Specifies if there are any special fire, explosion, or chemical hazards posed by the product.
- Examples:
 - Flammable - Do not use, pour, spill or store near heat or open flame
 - Corrosive - Store only in a corrosion-resistant tank



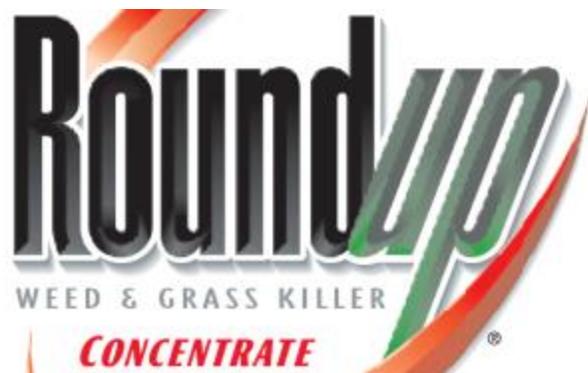
Monsanto

Roundup La **Roundup[®] Original** HERBICIDE

3.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.



Do not apply with a galvanized or unlined steel (except stainless steel) sprayer or through any irrigation system.

To clean sprayer after use, rinse sprayer and all sprayer parts with water 3 times. Spray rinse water on bare soil or gravel. After cleaning, sprayer may be used for other products.



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Pesticide Labels

Reentry Statement

- Specifies how much time must pass before people can reenter a treated area.
 - Can be hours or days
 - Most homeowner products use keep off until dry

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling.



People and pets may enter treated area after spray has dried.

Pesticide Labels

Specific Action Statements

- Recommend specific action that should be taken to prevent poisoning accidents

Examples:

- Do not breathe vapors or spray mist
- Do not get on skin or clothing
- Do not get in eyes

PRECAUTIONARY STATEMENTS	
CAUTION	Hazards to Humans and Domestic Animals
<ul style="list-style-type: none">• Causes moderate eye irritation.• Harmful if swallowed, inhaled or absorbed through skin.• Avoid contact with skin, eyes, or clothing.• Avoid breathing spray mist.• Wash hands thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.• Remove contaminated clothing and wash before reuse.	
FIRST AID +	
IN CASE OF ACCIDENTAL...	IMMEDIATELY...
SWALLOWING	<ul style="list-style-type: none">• 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 a poison control center or doctor.• Do not give anything by mouth to an unconscious person.
CONTACT WITH EYES	<ul style="list-style-type: none">• 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.
CONTACT WITH SKIN OR CLOTHING	<ul style="list-style-type: none">• 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.
<small>NOTE: When calling poison control center, have this product label accessible. If seeking treatment at an emergency room or doctor's office, bring this product label to show medical personnel. For medical emergency information, you may call toll-free 1-877-229-3763. Active Ingredient: 8.8% Triclopyr, triethylamine salt [CAS # 57213-69-1].</small>	

PRESS TO RESEAL

PRECAUTIONARY STATEMENTS 

HAZARDS TO HUMANS & DOMESTIC ANIMALS

CAUTION: Causes moderate eye irritation. Avoid contact with eyes or clothing. Avoid breathing spray mist. Wash thoroughly with soap and water after handling.

 People and pets may enter treated area after spray has dried.

Pesticide Labels

- Storage and Disposal
 - General instructions for the appropriate storage and disposal of the pesticide and its container.

 Do not allow children or pets onto treated areas until spray has dried.	
IMPORTANT- Directions for Storage and Disposal	
STORAGE CONDITIONS	Store in original container in a cool, dry place, out of the reach of children, preferably a locked storage cabinet. Protect from freezing.
DISPOSAL 	If Empty: <ul style="list-style-type: none">• Do not reuse empty container.• Place in trash. If Partly Filled: <ul style="list-style-type: none">• It is best to use all of the product in accordance with label directions.• If it is necessary to dispose of unused product, call your local solid waste agency or call toll-free 1-877-229-3724 for disposal instructions.• Never place unused product down any indoor or outdoor drain.

STORAGE AND DISPOSAL

STORAGE: Store in original container in a safe place.

DISPOSAL: Do not reuse container. Securely wrap partially filled or empty container in newspaper and put in trash.

Storage and Containment



Keep Pesticides in Original Containers







**PESTICIDE SAFETY
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RISK = TOXICITY X
EXPOSURE

MINIMUM RECOMENDED PPE



- Long sleeved shirt
- Long legged pants
- Shoes & socks
- Gloves

Gloves



To Minimize Pesticide Exposure:

- Wash or laundry all work clothes separate from household clothes



SIGNAL WORDS

- Danger-Poison
- Danger
- Warning
- Caution



Pesticides

- **LD₅₀ = dose (oral or dermal) needed to kill 50% of a population of a lab test animal measured in mg/kg of body weight.**
 - LD = lethal dose

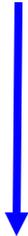
	LD ₅₀	
	Oral	Dermal
• Danger	0 - 50	0 - 200
• Warning:	50+ - 500	200+ - 2000
• Caution:	500+	2000+

Want to see what taking in a milligram per kilogram of your body weight amounts to? It's the equivalent of 726 people, each weighing 150 pounds, sharing a chocolate bar (~50 grams).



Relative Toxicity, rat LD50, mg/kg

**Least
toxic**

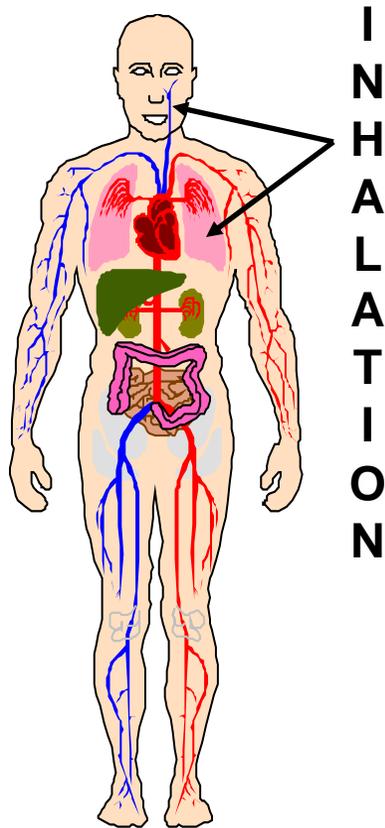


**Most
toxic**

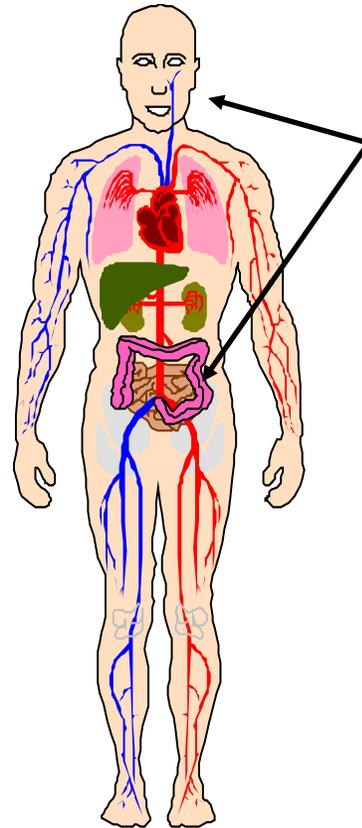
Sugar (sucrose)	29,700	Caution
Alcohol	14,000	
Trimec	6,700	
Glyphosate (Roundup)	5,600	
Atrazine	3,090	
Salt (sodium chloride)	3,000	
Imidacloprid (Premise)	2,590	Warning
Cyfluthrin (Tempo)	1,271	
Aspirin	1,000	
Chlordane	450	
Ammonia	350	
Caffeine	192	
Chlorpyrifos	135	Danger-Poison
Arsenic (arsenic acid)	48	
Nicotine	1	
Aldicarb (Temik)	0.93	
Dioxin (TCDD)	0.001	
Botulinum toxin	0.00001	



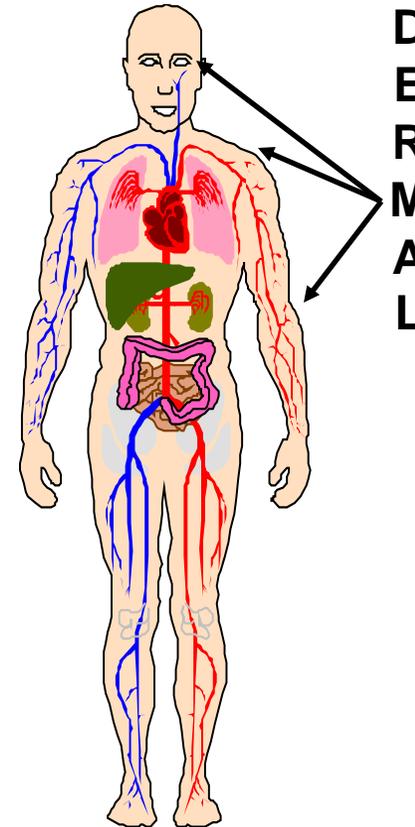
Exposure Routes



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Chemical Absorption by Human Skin

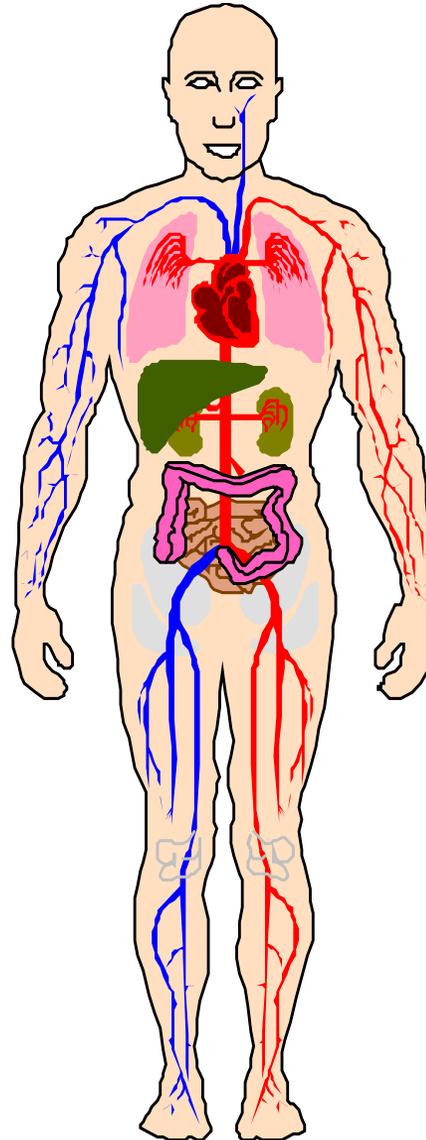
Foot arch 1

Palm 6 X

Forearm 8 X

Back 12 X

Scalp 25 X



Armpit 26 X

Forehead 43 X

Jaw 93 X

Groin area 300 X



ACUTE POISONING

Occurs from oral intake, skin exposure, and breathing (inhalation). Usually occurs within 12 hours of exposure.



CHRONIC POISONING

Arises from repeated exposure to doses of pesticides. Usually from small doses over an extended time period.

EARLY PESTICIDE POISONING SYMPTOMS

- Fatigue
- Headache
- Dizziness
- Blurred vision
- Diarrhea
- Excessive sweating
- Nausea & vomiting
- Stomach cramps

PESTICIDE POSIONING

- Call 911
- Call Poison Control Center @ 800-222-1222
- Take pesticide container to medical facility

Pesticides In the Food Chain

- Safety checks are in place to limit exposure to pesticides in food crops.
- To be used on food crops many tests must be done to determine the safety factor.
- One of the largest cost of registering a pesticide.



RESIDUE

Amount of pesticide remaining
on a crop, animal or surface
after treatment.

RESIDUE

- Used to be measured in ppm
- A step in a journey of 568 miles.
- Or one minute in two years.

- Now measured in 0.1 ppm or measured in ppb

- To give you an idea of how little this would be, a pinch of salt in 10 tons of potato chips is also a part per billion.
- **1 penny in 10 million dollars**
- **1 second in 32 years**
- **1 foot of a trip to the moon**
- **1 blade of grass on a football field**
- **1 drop of water in an Olympic-size swimming pool**



RESIDUE

- EPA sets the residue level - tolerance
- FDA enforces the tolerance



perspective on the “DIRTY DOZEN”

www.nurselovesfarmer.com

The “*Dirtiest”
Pesticide Residues

How Many ^Servings
a Child Can Safely Eat



154



1508



98413



176



2564

*Dirty fruits/veggies per EWG's shopper's guide 2014.

^Servings per day without any effect based on highest ever
recorded pesticide residue by USDA per Safe Fruits & Veggies.





What do global regulatory and research agencies conclude about the health impact of **GLYPHOSATE**?

Risk Assessment What is the likelihood that it will cause harm, based on dose and exposure?

EPA United States Environmental Protection Agency	USA	"Human health risk assessment concludes that glyphosate is not likely to be carcinogenic to humans... [and] no other meaningful risks to human health when the product is used according to the pesticide label"	2017
EPA United States Environmental Protection Agency Office of Pesticide Programs	USA	"Not strong support for... 'suggestive evidence of carcinogenic potential...' based on the weight-of-evidence... Even small, non-statistically significant changes... were contradicted by studies of equal or higher quality. The strongest support is for 'not likely to be carcinogenic to humans'"	2017
NTP National Toxicology Program	USA	"Little evidence of toxicity, and there was no evidence of glyphosate causing damage to DNA"	1992
Health Canada	Canada	"Products containing glyphosate do not present unacceptable risks to human health or the environment when used according to the revised product label directions... Risks to [occupational] handlers are not of concern for all scenarios"	2017
Health Canada	Canada	"No pesticide regulatory authority in the world currently considers glyphosate to be a cancer risk to humans at the levels at which humans are currently exposed"	2019
ECHA EUROPEAN CHEMICALS AGENCY	Europe	"Based on the epidemiological data as well as on data from long-term studies in rats and mice, taking a weight of evidence approach, no hazard classification for carcinogenicity is warranted"	2017
EFSA European Food Safety Authority	Europe	"Glyphosate is unlikely to be genotoxic or to pose a carcinogenic threat to humans... Neither the epidemiological data nor the evidence from animal studies demonstrated causality between exposure to glyphosate and the development of cancer in humans"	2015
European Commission Assessment Group on Glyphosate	Europe	"Taking all the evidence into account i.e. animal experiments, epidemiological studies and statistical analyses... The AGG proposes that a classification of glyphosate with regard to carcinogenicity is not justified."	2021
ANSES Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail	France	"Level of evidence of carcinogenicity in animals and humans is considered to be relatively limited"	2016
ANSES Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail	France	"36 [glyphosate-based] products ... will no longer be allowed for use from the end of 2020, due to a lack or absence of scientific data which would allow all genotoxic risk to be ruled out"	2019
BfR Bundesinstitut für Risikobewertung	Germany	"Available data do not show carcinogenic or mutagenic properties of glyphosate nor that glyphosate is toxic to fertility, reproduction or embryonal/fetal development in laboratory animals"	2015
Federal Department of Home Affairs FD/44 Federal Food Safety and Veterinary Office FSVO	Switzerland	"Residues of glyphosate in the foods investigated do not represent a risk of cancer"	2018
Australian Government Australian Pesticides and Veterinary Medicines Authority	Australia	"Glyphosate does not pose a carcinogenic risk to humans... Products containing glyphosate are safe to use as per the label instructions"	2016
Environmental Protection Authority Te Mana Rauhi Tiao	New Zealand	"Unlikely to be carcinogenic to humans or genotoxic (damaging to genetic material or DNA) and should not be classified as a mutagen or carcinogen"	2016
ANVISA Agência Nacional de Vigilância Sanitária	Brazil	"No evidence to indicate that the herbicide glyphosate is carcinogenic"	2019
Food Safety Commission of Japan	Japan	"No neurotoxicity, carcinogenicity, reproductive toxicity, teratogenicity, and genotoxicity"	2016
Rural Development Administration	Korea	"Epidemiological studies on glyphosate... found no cancer link"	2017
World Health Organization Food and Agriculture Organization of the United Nations	Global	"Glyphosate is unlikely to be genotoxic at anticipated dietary exposures. Glyphosate is unlikely to pose a carcinogenic risk to humans from exposure through the diet"	2016
World Health Organization Drinking-water quality guidelines	Global	"Under usual conditions, the presence of glyphosate and AMPA [aminomethylphosphonic acid, glyphosate's primary metabolite] in drinking-water does not represent a hazard to human health"	2004
World Health Organization International Programme on Chemical Safety	Global	"Available data on occupational exposure for workers applying Roundup indicate exposure levels far below the NOAELs [no observed adverse effect levels] from the relevant animal experiments"	1994

Glyphosate: scientific consensus vs the French media

EFSA European Food Safety Authority	✓	Unlikely to pose a risk for humans - EFSA	Citings 12 %
ECHA EUROPEAN CHEMICALS AGENCY	✓	Glyphosate not classified as a carcinogen [...] mutagen, or as toxic for reproduction - ECHA	6 %
EPA	✓	Unlikely to be carcinogenic - US EPA	0 %
Environmental Protection Authority Te Mana Rauhi Tiao	✓	Unlikely to be carcinogenic [...] to humans - NZ EPA	0 %
Australian Government Australian Pesticides and Veterinary Medicines Authority	✓	Exposure to glyphosate does not pose a cancer risk [...] to humans - APVMA	0 %
Health Canada	✓	Unlikely to pose a cancer risk in humans - PMRA	0 %
Rural Development Administration	✓	Animal tests show no connection to cancer - RDA	0 %
농촌진흥청 Rural Development Administration	✓	No [...] carcinogenicity [...] observed - FSC	0 %
食品安全委員会 Food Safety Commission of Japan	✓	Unlikely to pose a carcinogenic risk to humans from exposure through the diet - WHO/FAO	0 %
World Health Organization	✓	Exposure [...] through diet does not pose a risk for health - BLV/OSAV	0 %
ANSES Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail	✓	Evidence [...] does not permit classification [...] as carcinogenic - ANSES	0 %
International Agency for Research on Cancer World Health Organization	✗	Limited evidence of carcinogenicity in humans - IARC	73 %

Analysis by ChevrePensante.fr English infographic by Thoughtscapism

Longitudinal Study How glyphosate impacted 54,251 pesticide applicators since 1993.



Agricultural Health Study

USA

"No association was apparent between glyphosate and any solid tumors or lymphoid malignancies overall, including non-Hodgkin's lymphoma and its subtypes... some evidence of increased risk of AML [acute myeloid leukemia] among the highest exposed group that requires confirmation"

Hazard Assessment What is the potential to cause harm, regardless of dose or exposure?

International Agency for Research on Cancer



Global

"Limited evidence in humans for the carcinogenicity of glyphosate... Evidence in humans is from studies of exposures, mostly agricultural [e.g. not from dietary exposure]... A positive association has been observed for non-Hodgkin lymphoma... There is 'strong' evidence that exposure to glyphosate or glyphosate-based formulations is genotoxic"

2015

IARC placed glyphosate in its hazard category "Group 2A: probably carcinogenic to humans" along with red meat, hot beverages, and working as a barber. The evidence on carcinogenicity was less robust than for agents such as bacon, salted fish, oral contraceptives and wine.



PESTICIDE SAFETY EDUCATION PROGRAM
OSU Extension

Bayer will stop selling Roundup for residential use in 2023, an effort to prevent future cancer lawsuits

by Jessica Fu
07.30.2021, 3:40pm

Business



Roundup

FOR LAWNS₆

**KILLS WEEDS -
WON'T HARM LAWNS***

KILLS DOLLARWEED · DANDELION · CLOVER · YELLOW NUTSEDGE**

FOR USE ON SOUTHERN GRASSES

Keep Out Of Reach Of Children

CAUTION Stop! Read the entire label first. Observe all precautions and follow directions carefully. See back panel booklet for complete Precautionary Statements, including First Aid and Directions for Use, including Storage and Disposal.

ACTIVE INGREDIENTS:

Penoxsulam	0.14%
Sulfentrazone	0.14%
2,4-D, dimethylamine salt	1.46%
Dicamba, dimethylamine salt	0.41%
OTHER INGREDIENTS:	97.85%
Total	100.00%

Mantener Fuera Del Alcance De Los Niños

PRECAUCIÓN ¡Atento! Lea primero toda la etiqueta. Observe todos los avisos de precaución y siga atentamente las instrucciones. También preste atención a los avisos de precaución y primeros auxilios, y las instrucciones de uso, incluido el almacenamiento y eliminación, en la contraportada.

THIS PRODUCT CONTAINS:

0.013 lb Penoxsulam per gallon or 0.14%.
0.013 lb Sulfentrazone per gallon or 0.14%.
0.109 lb 2,4-dichlorophenoxyacetic acid equivalent per gallon or 1.21%.
0.031 lb 3,6-dichloro-o-anisic acid equivalent per gallon or 0.34%.

64804772B
2D CODE
LB22128

NET CONTENTS / CONTENIDO NETO: 32 fl oz (1 qt) / 946mL * when used as directed and other listed weeds. **See details on back.**

Roundup

FOR LAWNS₂

**KILLS WEEDS -
WON'T HARM LAWNS***

KILLS CRABGRASS · DANDELION · CLOVER · YELLOW NUTSEDGE***

FAST ACTING FOR VISIBLE RESULTS IN HOURS

Keep Out Of Reach Of Children

CAUTION Stop! Read the entire label first. Observe all precautions and follow directions carefully. See back panel booklet for additional precautionary statements and first aid.

ACTIVE INGREDIENTS:

MCPA, dimethylamine salt	3.85%
Quinclorac	1.80%
Dicamba, dimethylamine salt	0.43%
Sulfentrazone	0.22%
OTHER INGREDIENTS:	93.70%
Total	100.00%

Mantener Fuera Del Alcance De Los Niños

PRECAUCIÓN ¡Atento! Lea primero toda la etiqueta. Observe todos los avisos de precaución y siga atentamente las instrucciones. También preste atención a los avisos de precaución y los primeros auxilios en la contraportada.

THIS PRODUCT CONTAINS:

0.264 lb 2-methyl-4-chlorophenoxyacetic acid equivalent per gallon or 3.14%
0.152 lb 3,7-dichloro-8-quinolinecarboxylic acid per gallon or 1.80%
0.030 lb 3,6-dichloro-o-anisic acid equivalent per gallon or 0.36%
0.019 lb N-[2,4-dichloro-5-[4-(difluoromethyl)-4,5-dihydro-3-methyl-5-oxo-1H-1,2,4-triazol-1-yl] phenyl] methanesulfonamide per gallon or 0.22%

PPN10013U1-01
2D CODE
LB15903

* When used as directed
** As listed
*** See inside booklet for weed list

NET CONTENTS / CONTENIDO NETO: 32 fl oz (1 qt) / 946mL

**3 UP TO
MONTH
CONTROL***

Roundup

**WEED &
GRASS KILLER₄**

EXCLUSIVE FORMULA

- RAINPROOF IN AS FAST AS 30 MINUTES
- VISIBLE RESULTS IN HOURS



Keep Out of Reach of Children

CAUTION See back panel booklet for additional precautionary statements.

Mantener Fuera del Alcance de los Niños

PRECAUCIÓN Vea los avisos adicionales de precaución en el panel posterior.

ACTIVE INGREDIENTS:

Triclopyr, dimethylamine salt	0.122%
Flazasulop-P-butyl	0.097%
Diquat dibromide	0.073%
OTHER INGREDIENTS	99.708%
TOTAL	100.000%

Contains 0.0073 lbs. triclopyr acid equivalent, 0.0081 lbs. flazasulop-P-butyl, and 0.0061 lbs. diquat dibromide per US gallon.

PPN 40161V1-02
2D CODE
LB17903

NET 1 GAL (128 FL OZ/3.78 L)

What is now in some Roundups if not glyphosate?

#1

- Penoxsulam
- Sulfentrazone
- 2, 4-D
- Dicamba



The image shows a product label for Roundup For Lawns. At the top, the brand name "Roundup" is written in a large, bold, black font with a green swoosh underneath, followed by "FOR LAWNS" in a smaller green font. Below this, there is a green field with a large, stylized green weed. The text "KILLS WEEDS - WON'T HARM LAWNS" is written in large, white, bold letters across the middle. Below this, it says "KILLS DOLLARWEED · DANDELION · CLOVER · YELLOW NUTSEGE**" in yellow and white. A purple banner contains the text "FOR USE ON SOUTHERN GRASSES". Below the banner, there are two columns of text: "Keep Out Of Reach Of Children" and "Mantener Fuera Del Alcance De Los Niños". Underneath these are the words "CAUTION" and "PRECAUCION" in large, bold letters. To the right of "PRECAUCION" is a small box with the text "64804772B", "2D CODE", and "L82128". Below the caution text is a table of ingredients and their percentages. At the bottom, it says "NET CONTENTS / CONTENIDO NETO: 32 fl oz (1 qt) / 946mL" and includes footnotes for asterisks.

Roundup
FOR LAWNS₆

**KILLS WEEDS -
WON'T HARM LAWNS**

KILLS DOLLARWEED · DANDELION · CLOVER · YELLOW NUTSEGE**

FOR USE ON SOUTHERN GRASSES

Keep Out Of Reach Of Children **Mantener Fuera Del Alcance De Los Niños**

CAUTION Stop! Read the entire label first. Observe all precautions and follow directions carefully. See back panel booklet for complete Precautionary Statements, including First Aid and Directions for Use, including Storage and Disposal.

PRECAUCION ¡Atención! Lea primero toda la etiqueta. Observe todos los avisos de precaución y siga atentamente las instrucciones. También preste atención a los avisos de precaución y primeros auxilios, y las instrucciones de uso, incluido el almacenamiento y eliminación, en la contraportada.

ACTIVE INGREDIENTS:		
Penoxsulam	0.14%	0.013 lb Penoxsulam per gallon or 0.14%.
Sulfentrazone	0.14%	0.013 lb Sulfentrazone per gallon or 0.14%.
2,4-D, dimethylamine salt	1.46%	0.109 lb 2,4-dichlorophenoxyacetic acid equivalent
Dicamba, dimethylamine salt	0.41%	per gallon or 1.21%.
OTHER INGREDIENTS:	97.85%	0.031 lb 3,6-dichloro-o-anisic acid equivalent per
Total	100.00%	gallon or 0.34%.

NET CONTENTS / CONTENIDO NETO: 32 fl oz (1 qt) / 946mL * when used as directed
** and other listed weeds. Weed details on back.

64804772B
2D CODE
L82128



- MCPA
- Quinclorac
- Dicamba
- Sulfentrazone



- Triclopyr
- Fluazifop-P-butyl
- Diquat dibromide



WEED & GRASS KILLER₄

EXCLUSIVE FORMULA

- RAINPROOF IN AS FAST AS 30 MINUTES
- VISIBLE RESULTS IN HOURS

KILLS THE ROOTS GUARANTEED*

Keep Out of Reach of Children
CAUTION See back panel booklet for additional precautionary statements.

Mantener Fuera del Alcance de los Niños
PRECAUCIÓN Vea los avisos adicionales de precaución en el panel posterior.

ACTIVE INGREDIENTS:	
Triclopyr, triethylamine salt	0.122%
Fluazifop-P-butyl	0.091%
Diquat dibromide	0.073%
OTHER INGREDIENTS	99.78%
TOTAL	100.000%

Contains 0.0073 lbs. triclopyr acid equivalent, 0.0081 lbs. fluazifop-P-butyl, and 0.0061 lbs. diquat dibromide per US gallon.

PPN 40161V1-02
 2-D CODE
 1517503

NET 1 GAL (128 FL OZ/3.78 L)

https://www.euractiv.com/section/agriculture-food/news/eu-commission-proposes-to-re-approve-glyphosate-for-10-years/

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EU Commission proposes to re-approve glyphosate for 10 years

By Julia Dahm | EURACTIV.com Est. 5min Sep 20, 2023 (updated: Sep 21, 2023) Advertisement



Julia Dahm
Reporter, Agrifood
Location: Brussels
Languages: German, English, French
Expertise: Agrifood, Health, Social Policy
Location Expertise: Germany, Austria, Luxembourg

✉





THE FUTURE OF FOOD CONFERENCE
Sparks Meeting Venue, Brussels
26 October 2023
[Find out more](#)

If passed, the regulation will mean that glyphosate - the most widely used herbicide in the EU - can continue to be used in plant protection across the EU for the next decade, but that the approval can be reconsidered at any point during this time if need be. [SHUTTERSTOCK/Matchou]

EURACTIV Members

PFP - Primary Food Processors

Recommended articles

Monsanto wins 9th consecutive court case in glyphosate litigation

Juliette Fairley | St. Louis Record | October 2, 2023



ABOUT GLP

TOPICS

GLP ARTICLES

SPECIAL SECTIONS

RESEARCH

WRITE FOR GLP



Credit: Credit: Mike Mozart andTheToyChannel/JeepersMedia via CC-BY-2.0



DISPOSAL of EXCESS PESTICIDES

- Use up according to label directions is best
- Take advantage of household hazardous waste day collections
- Farm and Commercial type pesticides can now be disposed of at the Unwanted Pesticide Collection Events.

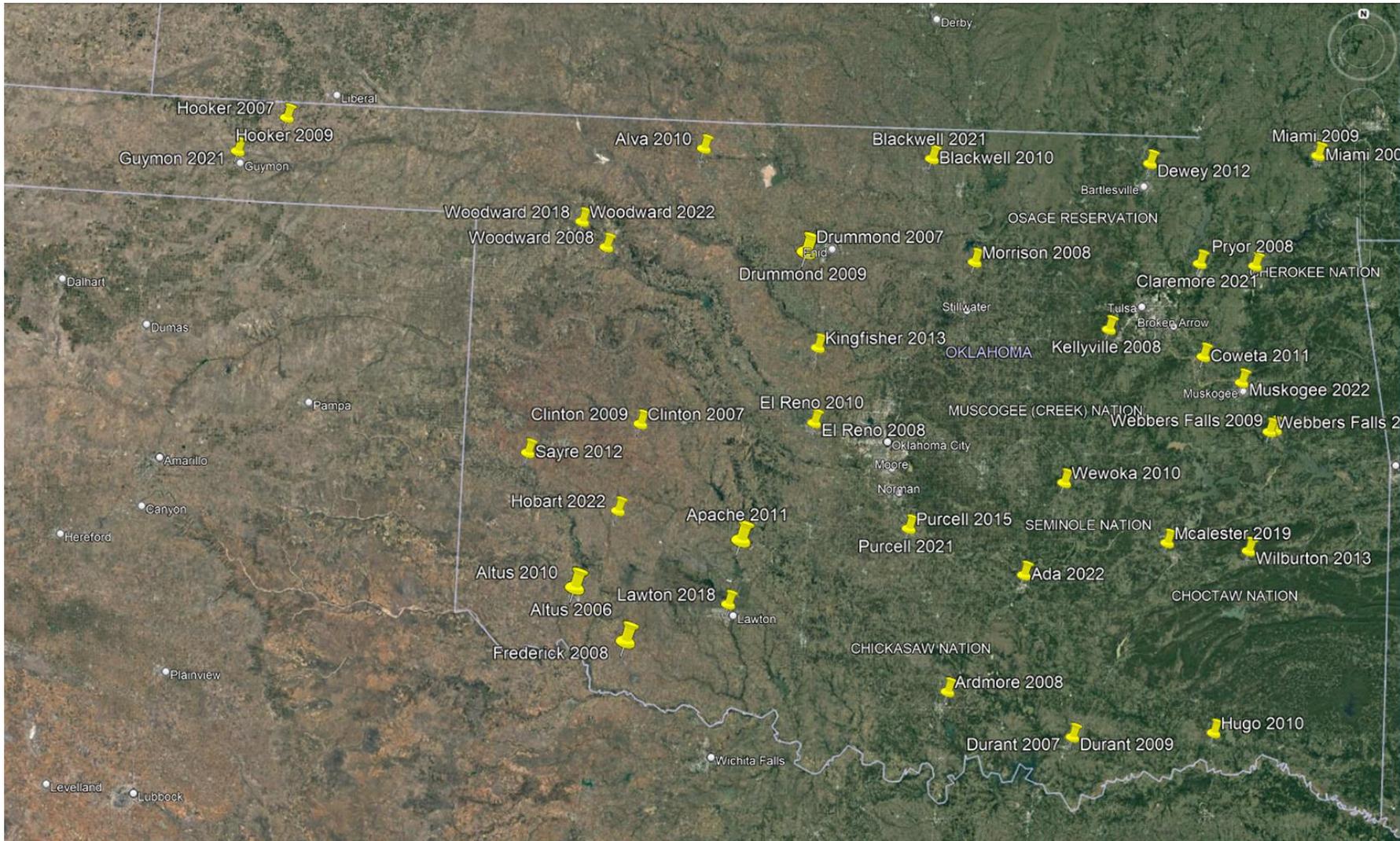
Next Collections

Date	County	City	Location
May 5 ,2025	Stephens	Duncan	Stephens County Fairgrounds
May 7 ,2025	Canadian	El Reno	Canadian Co. Extension Center
May 8, 2025	Craig	Vinita	Craig County Fairgrounds

8:00 am to 1:00 pm at all locations.

For small quantities and homeowner type pesticides always take advantage of municipal household hazardous waste (HHW) collections if available in your area.

Unwanted Pesticide Disposal Sites



Terms of Program

- All pesticides products are taken . Fertilizer coated with pesticide can be taken. No other hazardous waste such as oil, paint, etc. only pesticides.
- Products are not waste until handed off to the contractor Clean Earth
- Clean Earth becomes waste generator
- Will take unknowns but you should at least know they are a pesticide
- There is no cost for the first 2,000 pounds disposed of per entity



Unwanted Pesticide Disposal

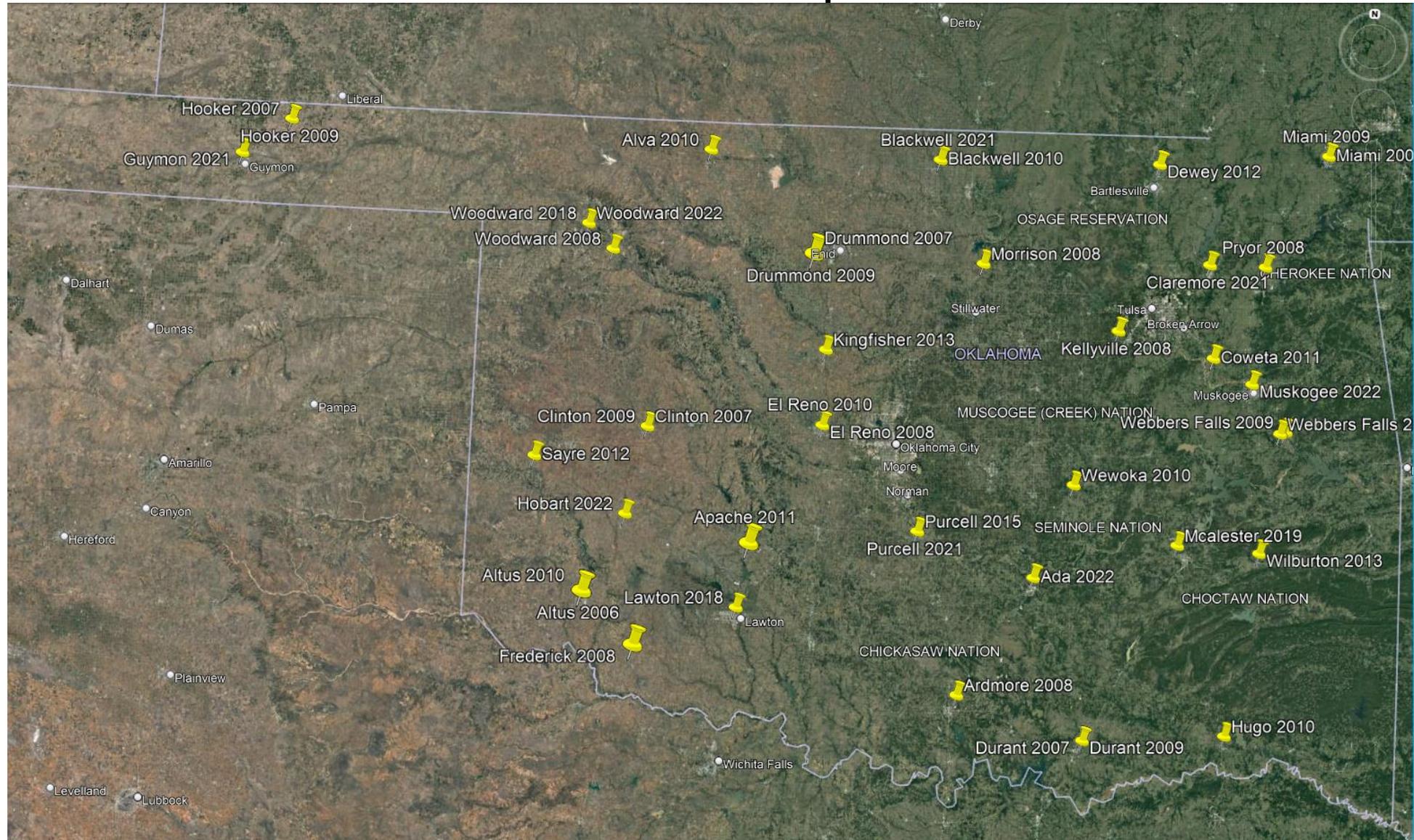
- First Collection in December 2006
- Administered by ODAFF
- Pesticide Registration fees fund program
- 1,390,847 Pounds Collected Over 53 Collections

Collection Totals in Pounds

Year	County	Pounds					
2006	Altus	61,920					
	2007	Drummond	40,148				
		Webbers Falls	22,184				
		Durant	9,947				
		Miami	5,224				
		Clinton	51,827				
		Hooker	16,176				
		2008	Frederick	16,070			
			Ardmore	4,912			
			El Reno	44,158			
Pryor			12,355				
McAlester	17,357						
Kellyville	19,265						
Morrison	16,113						
Woodward	17,450						
2009	Durant		10,087				
	Miami		7,118				
	Drummond	14,135					
	Webbers Falls	18,992					
	Clinton	55,940					
	Hooker	8,400					
	2010	El Reno	36,650				
		Wewoka	9,030				
		Hugo	3,130				
		Altus	33,946				
Alva		4,995					
Blackwell		35,315					
Coweta		28,420					
2011		Ada	17,388				
		Apache	21,105				
		2012	Sayre	30,770			
	Dewey		18,955				
	2013		Wilburton	6,965			
			Kingfisher	50,745			
			2015	Purcell	68,800		
				2018	Woodward	78,776	
					Lawton	37,000	
					2019	McAlester	47,237
2021						Purcell	54,032
						Claremore	21,565
		Blackwell				30,419	
		Guymon				15,666	
	2022	Ada				12,365	
		Hobart				59,739	
		Woodward	26,180				
		Muskogee	12,971				
		2023	McAlester	2,472			
			Kingfisher	38,643			
Walters			29,651				
Buffalo			8,153				
Dewey			15,603				
2024			Altus	34,702			
	Shawnee		29,681				

1,390,847 Pounds Collected Since 2006

Unwanted Pesticide Disposal Sites



Terms of Program

- All pesticides products are taken . Fertilizer coated with pesticide can be taken. No other hazardous waste such as oil, paint, etc. only pesticides.
- Products are not waste until handed off to the contractor Clean Earth
- Clean Earth becomes waste generator
- Will take unknowns but you should at least know they are a pesticide
- There is no cost for the first 2,000 pounds disposed of per entity

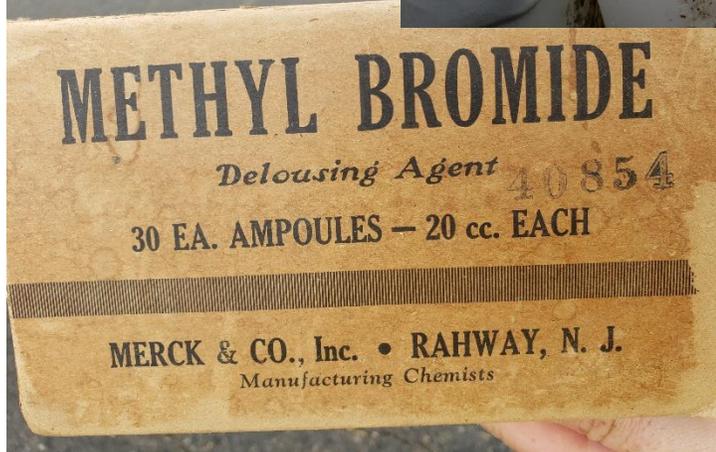




Ada 2022



McAlester 2019



Contact Information

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Oklahoma Department of Agriculture

Consumer Protection Services

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Oklahoma State University

Pesticide Safety Education Program

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**PESTICIDE SAFETY
EDUCATION PROGRAM**

OSU Extension



**PESTICIDE SAFETY
EDUCATION PROGRAM**

OSU Extension

For More Information & Future Dates

Go to

<http://pested.okstate.edu/unwanted.htm>



EXTENSION