Calibration For Success

Jim Bean
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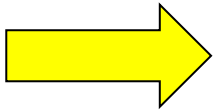
Safe Use & Handling of Pesticides

Know the risks



Manage the risks

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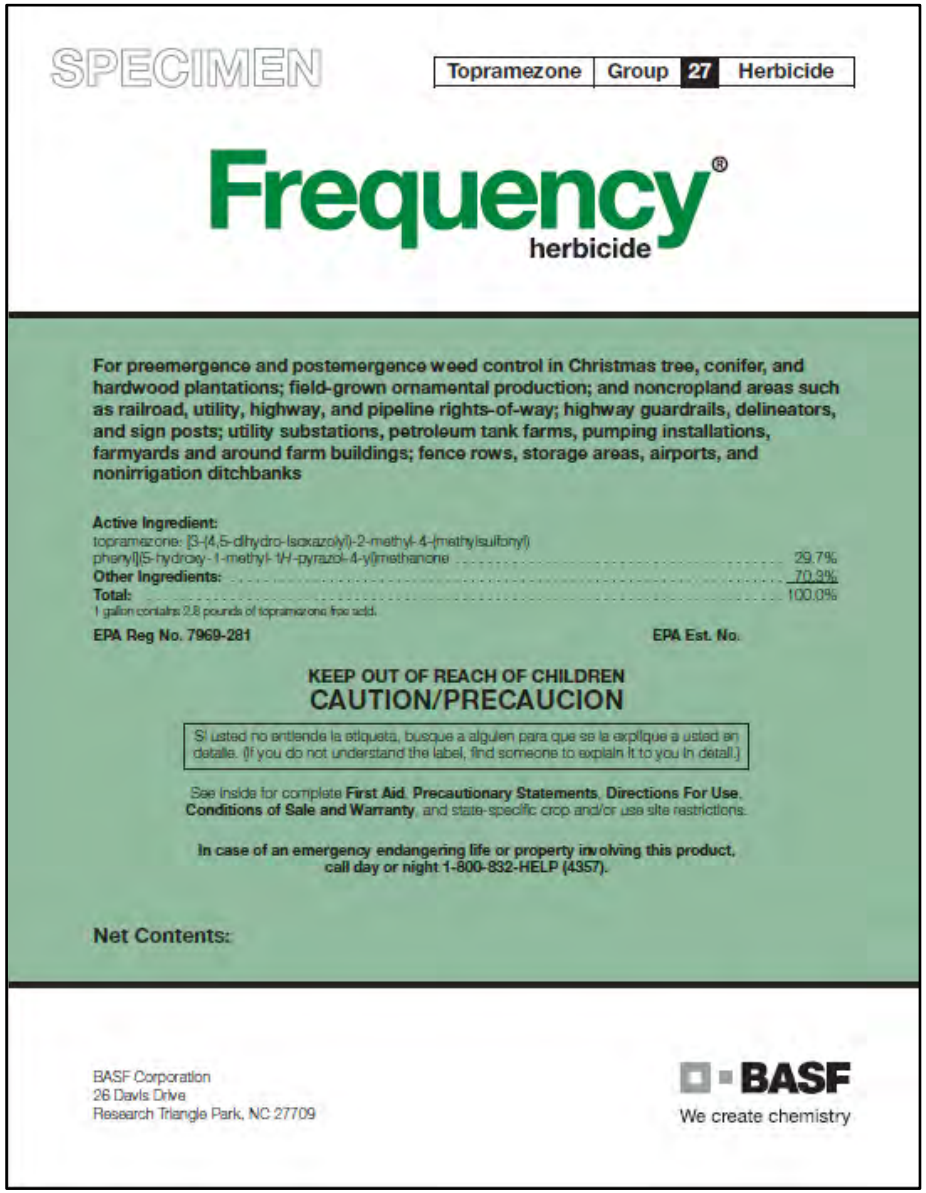
Read and Follow the LABEL!



SPECIMEN

Topramezone | Group 27 | Herbicide

Frequency®
herbicide

For preemergence and postemergence weed control in Christmas tree, conifer, and hardwood plantations; field-grown ornamental production; and noncropland areas such as railroad, utility, highway, and pipeline rights-of-way; highway guardrails, delineators, and sign posts; utility substations, petroleum tank farms, pumping installations, farmyards and around farm buildings; fence rows, storage areas, airports, and nonirrigation ditchbanks

Active Ingredient:
topramezone: [3-(4,5-dihydro-isoxazolyl)-2-methyl-4-(methylsulfonyl) phenyl](5-hydroxy-1-methyl-1*H*-pyrazol-4-yl)methanone 29.7%
Other Ingredients: 70.3%
Total: 100.0%
1 gallon contains 2.8 pounds of topramezone free acid.

EPA Reg No. 7969-281 **EPA Est. No.**

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.)

See inside for complete **First Aid**, **Precautionary Statements**, **Directions For Use**, **Conditions of Sale and Warranty**, and state-specific crop and/or use site restrictions.

In case of an emergency endangering life or property involving this product, call day or night 1-800-832-HELP (4357).

Net Contents:

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Steps To Success

- Correct mix
- Correct application technique
- Correct equipment
- Correct time of year
- Correct weather
- What can possibly go wrong?

No Calibration!

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Why Should You Calibrate?

- Ensures you follow label rates
- Ensures uniform application
- Provides best results
- Saves Money
- Opportunity to check equipment for leaks, clogged nozzles, etc.
- Check calibration frequently

Basics of Calibration

- Determine Flow Rate (Gallons per minute)
- Measure Effective Swath (Inches)
- Determine Application Speed (Miles per hour)

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Calibration

- Boom / Boomless Sprayer
- Handguns
- Backpacks

Boom or Boomless Nozzle Calibration

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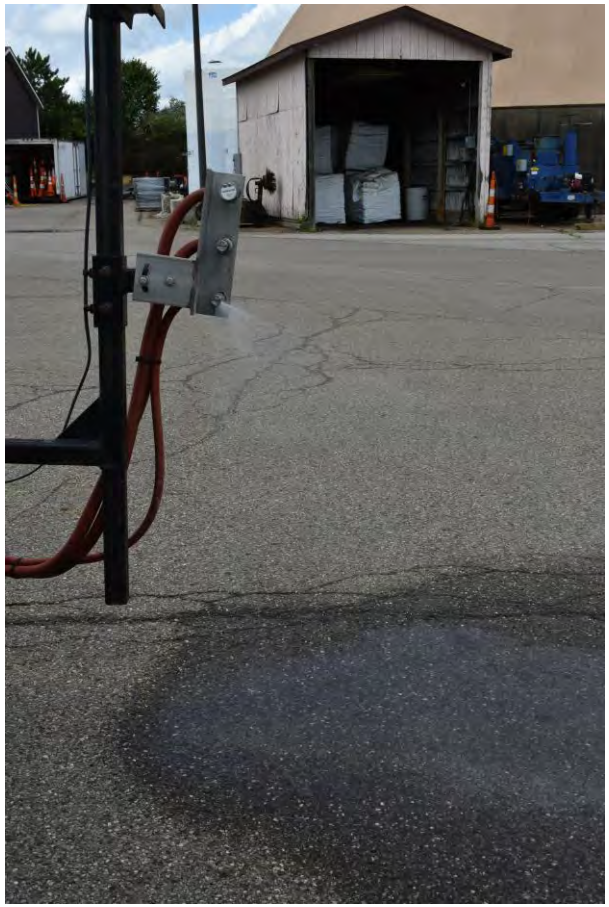
Inspect Equipment

Use water to ……

- Look for leaks
- Worn hoses
- Worn nozzles
- Test reliability of engine and pump



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Determine Flow Rate

- Spray water for 15 seconds **(272 oz. or 2.125 gallons)**
  - Measure by meter
  - Measure with a bucket
- Multiply by 4
- **2.125 gallons x 4 = 8.5 gallons per minute**

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Common Questions

- Dealing with tractor trailer wind
  - Increase nozzle size
  - Increase water volume
  - Add drift retardant
- Calibration when using multiple nozzles sizes
  - Same as steps shown
- Preventing an untreated stripe on the edge of pavement
  - Add a nozzle to treat this area – slightly higher rate is ok

Determine Effective Swath Width

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Determine Effective Swath Width

- Measure effective spray swath in inches

30 ft. x 12 inches = 360 inches

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Determine Application Speed

- Determine speed **(1 mph = 88 ft. per min. or 1.467 ft. per sec.)**
  - Utilize speedometer or other digital readout
    - Always verify over a known distance

      5280 ft. / 515 seconds / 1.467 ft. per second = 6.99 mph
  - Measure travel time over a known distance

    200 ft. / 20 seconds /1.467 ft. per second = 6.82 mph

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Complete Calibration

$$\frac{\text{Gal. Per Min. x 5,940}}{\text{MPH x Swath Width (inches)}}$$

$$\frac{\text{8.5 gal. per min. x 5,940}}{\text{7 mph x 360 inches}} \Rightarrow \frac{50{,}490}{2{,}520} = 20.04 \text{ GPA}$$

Note: 5940 is a constant

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Watch Outs

- Use pressure, flow charts and nozzle guides as reference!
  - Test and verify in the field
- Check speed in field
  - Don’t rely on speedometer of vehicle
- Check for fines
  - Reduce Pressure
  - Use larger orifices
- Use “effective” swath width in you calculations
- Check calibration frequently and every time you change equipment

Handgun Calibration

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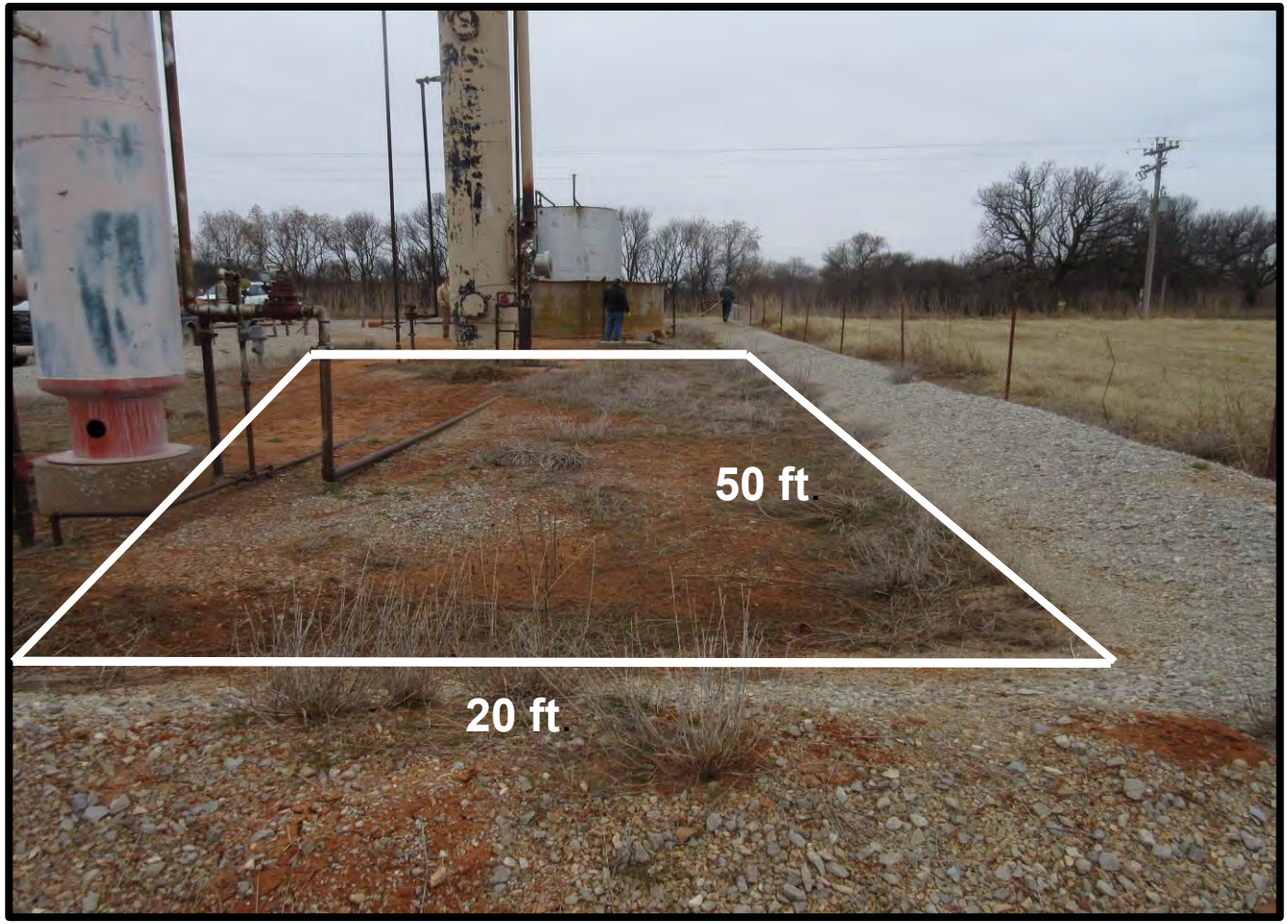
Handgun Calibration



Measure 1,000 sq. ft. area

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Handgun Calibration

Time (in Sec.) Spray
Duration: 65 seconds

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Handgun Calibration

Spray into Bucket for 65 seconds
2.25 gallons

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Handgun Calibration

2.25 gallons x 43.56 = 98 gallons per acre

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Backpack Calibration

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Backpack Calibration

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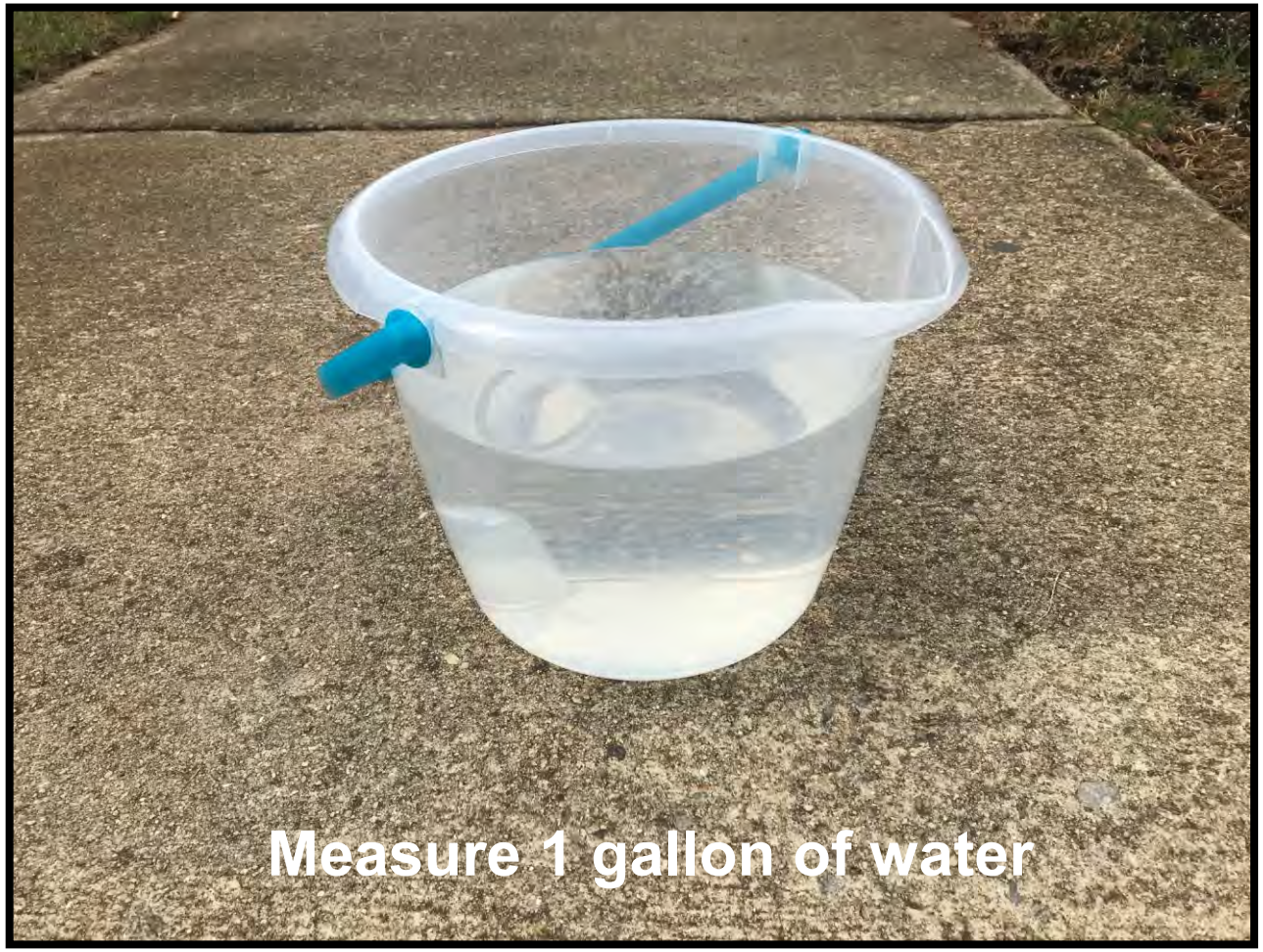
Backpack Calibration



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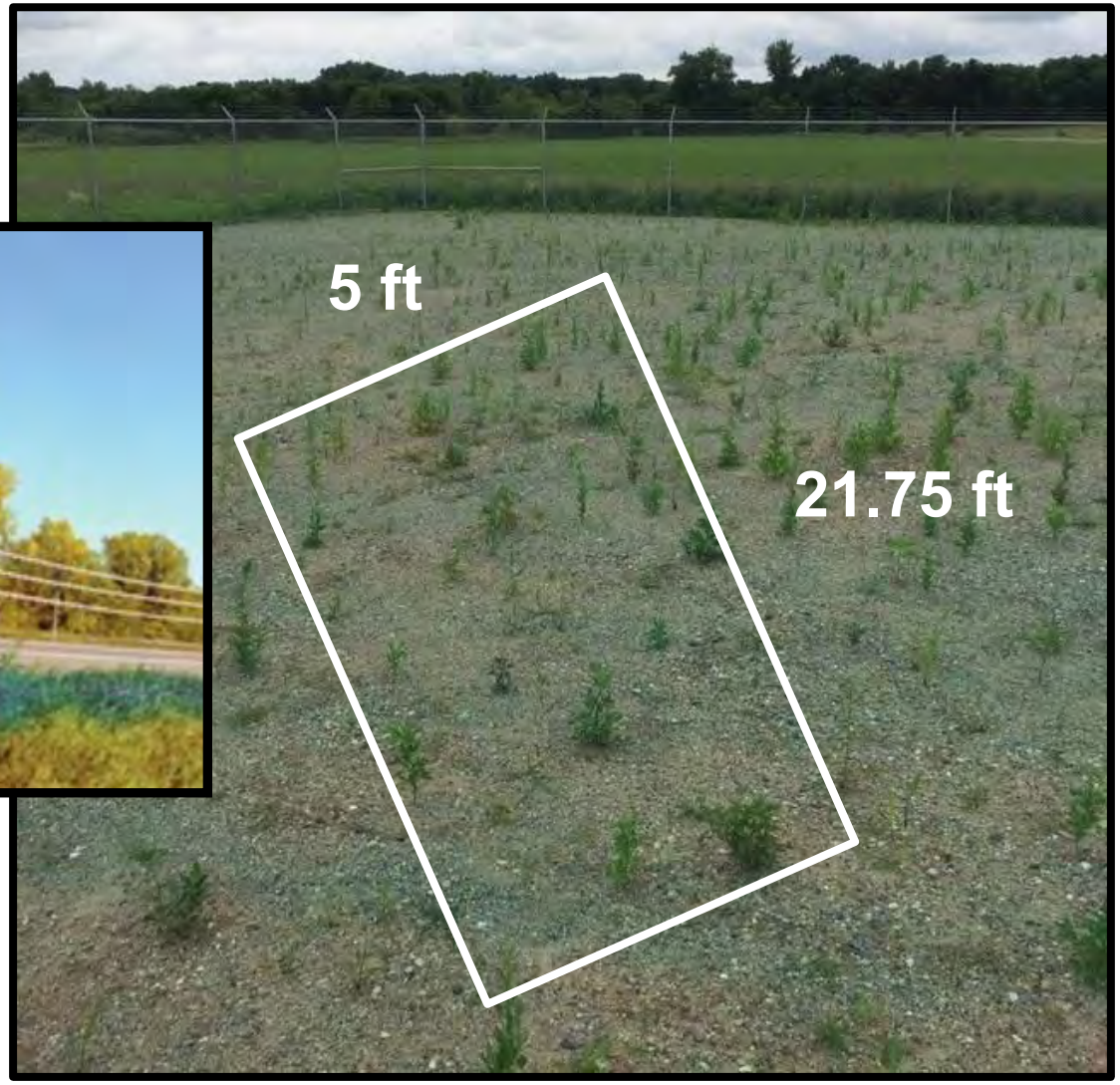
Spray Area



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Measure Water Used

Pour or Spray Leftover Water into Measuring Bucket
0.75 gallons

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Backpack Calibration Calculation

- Area Sprayed = 0.0025 acres
- Volume Used = 0.25 gallons
- Gallons Per Acre = 0.25 /.0025 = 100 GPA
- For 12 oz. Plateau per acre mix = 12 x .0025 = 0.03 oz. per 0.25 gallon or 0.12 oz per gallon of water

Calibration Summary

Minimizes the amount of herbicide

Saves money

Minimizes exposure

Protects the environment

Ensures success

What is Wrong?

3 oz. Plateau + 7 oz. Milestone + 0.3 oz. Escort XP

1 MAT

PLATEAU herbicide
QUALITY TAKES TIME.

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What is Wrong?

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What is Wrong?

What is Wrong?

1 WAT

11 MAT

10 oz. Frequency + 2 oz. Detail + 32 oz. Arsenal + 1% MSO

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What is Wrong?

3 WAT

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What is Wrong?

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What is Wrong?

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Pesticide Impact on Bees

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Pesticide Impact on Bees

Other terrestrial non-mammals:
mallard duck/LC50: > 5,000 ppm
With high probability not acutely harmful to terrestrial organisms.
Honey bee/LD50: > 100 ug/bee
With high probability not acutely harmful to terrestrial organisms.

Degradability / Persistence
Biological / Abiological Degradation

Evaluation: Not readily biodegradable (by OECD criteria).

Other adverse effects:

The ecological data given are those of the active ingredient. Do not release untreated into natural waters.

Pesticide Impact on Bees

Pesticide Toxicity to Bees "Traffic Light"

Red = Highly Toxic to Bees (LD50<2µg a.i./bee); Yellow = Moderately Toxic to Bees (LD50 2-11 µg a.i./bee); Green = Relatively Non-toxic to Bees (LD50>11µg a.i./bee)

The information in this table was compiled by the NC Dept. of Agriculture and CS, Structural Pest Control and Pesticides Division from the: NC Agricultural Chemicals Manual (2016); WIN-PST tool referenced in USDA NRCS/Xerces Society Agronomy Technical Note #9; EPA list of RT25 data; and Pacific Northwest Extension Publication 591 How to Reduce Bee Poisoning from Pesticides by Hooven, L., Sagili, R., and Johansen, E.

a = derived from Pacific Northwest Extension Publication 591

b = RT 25varies with formulation and application rate

Application in evening should be minimal risk to bees by morning because residual toxicity time (RT25) <8 hours

Active ingredient	Trade Names of Agricultural, N	Toxicity classification	Use/pest classification	RT25
Abamectin (Avermectin)	Zephyr	Highly toxic	Miticide	>8a
Acephate	Orthene	Highly toxic	Insecticide	>72a
Aldicarb	Temik	Highly toxic	Insecticide	
Azinphos-methyl	Guthion	Highly toxic	Insecticide	>96a
Bifenthrin	Brigade, Fanfare, Discipline, Sniper, Capture, Declare, Bifenture	Highly toxic	Insecticide	
Carbaryl	Sevin	Highly toxic	Insecticide	>42
Carbaryl (Sevin 4 Oil)		Highly toxic	Insecticide	
Carbofuran		Highly toxic	Insecticide	
Chlorethoxyfos		Highly toxic	Insecticide	
Chlorfenapyr		Highly toxic	Miticide	varies [b]
Chlorpyrifos	Lorsban, Warhawk	Highly toxic	Insecticide	>24
Chlorpyrifos methyl		Highly toxic	Insecticide	
Clothianidin	Poncho, Belay	Highly toxic	Insecticide	≥112
Cyfluthrin	Tombstone	Highly toxic	Insecticide	>24 [a]
Cypermethrin	Ammo	Highly toxic	Insecticide	>96
Deltamethrin	Decis	Highly toxic	Insecticide	5.2
Diazinon	Diazinon	Highly toxic	Insecticide	48 [a]
Dichlorvos		Highly toxic	Insecticide	<3
Dicrotophos	Bidrin	Highly toxic	Insecticide	varies [b]
Dieldrin (Cancelled in U.S.)		Highly toxic	Insecticide	
Dimethoate		Highly toxic	Insecticide	>24[a]

Pesticide Impact on Bees

Acetamiprid	Assail	Moderately toxic	Insecticide		>8
Allethrin		Moderately toxic	Insecticide		
Arsenic acid		Moderately toxic	Herbicide		
Azadirachtin	Aza-Direct, Trilogy, Azatrol, Azera	Moderately toxic	Miticide		<2
Benomyl		Moderately toxic	Fungicide		
Bifenazate	Acramite	Moderately toxic	Miticide		<3
Bromoxynil octanoate		Moderately toxic	Herbicide		
Captan	Captan	Moderately toxic	Fungicide		
DDT (Cancelled in U.S.)		Moderately toxic	Insecticide		
Demeton		Moderately toxic	Insecticide		
Dicamba		Moderately toxic	Herbicide		
Dimethomorph		Moderately toxic	Fungicide		
Disulfoton		Moderately toxic	Insecticide		5.5
Endosulfan	Thionex	Moderately toxic	Insecticide		<3
Ethoprop		Moderately toxic	Nematicide		
Fenarimol		Moderately toxic	Fungicide		
Fluazinam		Moderately toxic	Fungicide		
Fonofos		Moderately toxic	Insecticide		<8
Mesosulfuron methyl		Moderately toxic	Herbicide		
Oxydemeton-methyl		Moderately toxic	Insecticide		≤8[a]
Paraquat dichloride		Moderately toxic	Herbicide		
Pirimicarb		Moderately toxic	Insecticide		24[a]
Pirimicarb Aphox formulation		Moderately toxic	Insecticide		
Sethoxydim		Moderately toxic	Herbicide		
Spinetoram	Radiant, Delegate	Moderately toxic	Insecticide		3
Spiroxamine		Moderately toxic	Fungicide		<2
Terbufos	Counter	Moderately toxic	Insecticide		
Triflumazole/Thiacloprid EC mixture		Moderately toxic	Fungicide		

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Pesticide Impact on Bees

2,4 DP-p-2-EHE		Relatively nontoxic	Herbicide	
2,4-D 2-EHE		Relatively nontoxic	Herbicide	
2,4-D Acid		Relatively nontoxic	Herbicide	
2,4-DB Acid		Relatively nontoxic	Herbicide	
2,4-DP 2-Butoxyethyl Ester		Relatively nontoxic	Herbicide	
2,4-DP-p, DMA salt		Relatively nontoxic	Herbicide	
2-Hydroxyethyl octyl sulfide		Relatively nontoxic	Insecticide	
Acequinocyl	Kanemite	Relatively nontoxic	Miticide	
Acequinocyl (15% formulation)		Relatively nontoxic	Miticide	
Acequinocyl (15%SC Formulation)		Relatively nontoxic	Miticide	
Acequinocyl (15%SC formulation)		Relatively nontoxic	Miticide	
Acetochlor		Relatively nontoxic	Herbicide	
Acibenzolar-s-methyl	Actaguard	Relatively nontoxic	Fungicide	
Alachlor		Relatively nontoxic	Herbicide	
Ametryn		Relatively nontoxic	Herbicide	
Amicarbazone		Relatively nontoxic	Herbicide	
Aminopyralid		Relatively nontoxic	Herbicide	
Amitraz		Relatively nontoxic	Insecticide	0
Amitrole		Relatively nontoxic	Herbicide	
Amitrole (Weedazol formulation)		Relatively nontoxic	Herbicide	
Ammonium soaps of fatty acids		Relatively nontoxic	Herbicide	
Ancymidol		Relatively nontoxic	Herbicide	
Anilazine		Relatively nontoxic	Fungicide	

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Pesticide Impact on Bees

Fosamine ammonium	Relatively nontoxic	Herbicide
Fosetyl-Al	Relatively nontoxic	Fungicide
Gentamicin	Relatively nontoxic	Microbiocide
Glufosinate-ammonium	Relatively nontoxic	Herbicide
Glyphosate (MON 77360 formulation)	Relatively nontoxic	Herbicide
Glyphosate isopropylamine salt	Relatively nontoxic	Herbicide
Halofenozide	Relatively nontoxic	Insecticide
Halosulfuron methyl	Relatively nontoxic	Herbicide
Hexazinone	Relatively nontoxic	Herbicide
Hexythiazox	Relatively nontoxic	Miticide
Hydramethylnon	Relatively nontoxic	Insecticide
ICIS-0748	Relatively nontoxic	Growth Reg.
Imazamethabenz	Relatively nontoxic	Insecticide
Imazamox	Relatively nontoxic	Herbicide
Imazapic-ammonium	Relatively nontoxic	Herbicide
Imazapyr	Relatively nontoxic	Herbicide

Pesticide Impact on Bees

Quinclorac		Relatively nontoxic	Herbicide	
Quinoxyfen		Relatively nontoxic	Fungicide	
Quizalofop-ethyl		Relatively nontoxic	Herbicide	
Rimsulfuron		Relatively nontoxic	Herbicide	
Sabadilla alkaloids		Relatively nontoxic	Insecticide	>24
Siduron		Relatively nontoxic	Herbicide	
Simazine		Relatively nontoxic	Herbicide	
S-Metolachlor isomer		Relatively nontoxic	Herbicide	
Sodium Cacodylate/Cacodylic acid		Relatively nontoxic	Herbicide	
Sodium Dalapon		Relatively nontoxic	Herbicide	
Spiromesifen	Oberon	Relatively nontoxic	Insecticide	
Spiromesifen BSN 2060 SC 240 formulation		Relatively nontoxic	Insecticide	
Streptomycin		Relatively nontoxic	Fungicide	
Sulfentrazone		Relatively nontoxic	Herbicide	
Sulfometuron methyl		Relatively nontoxic	Herbicide	
Sulfosate (Glyphosate-trimesium)		Relatively nontoxic	Herbicide	
Sulfosulfuron		Relatively nontoxic	Herbicide	
Tebufenozide	Confirm	Relatively nontoxic	Insecticide	
Tebuthiuron		Relatively nontoxic	Herbicide	

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Pesticide Impact on Bees

Triclopyr acid	Relatively nontoxic	Herbicide
Triclopyr BEE/Picloram ethyl ester mixture	Relatively nontoxic	Herbicide
Triclopyr butoxyethyl ester	Relatively nontoxic	Herbicide
Triclopyr triethylamine salt	Relatively nontoxic	Herbicide
Trifloxystrobin	Relatively nontoxic	Fungicide
Trifloxysulfuron sodium	Relatively nontoxic	Herbicide
Triflumizole	Relatively nontoxic	Fungicide
Trifluralin	Relatively nontoxic	Herbicide
Triflusulfuron methyl	Relatively nontoxic	Herbicide
Triforine	Relatively nontoxic	Fungicide
Triphenyltin hydroxide (TPTH)	Relatively nontoxic	Fungicide
Triticonazole	Relatively nontoxic	Fungicide
Uniconazole	Relatively nontoxic	Growth Reg.

Let’s Work Together!

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Questions?

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Thank You!

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