

# Pesticide Stewardship



# Outline

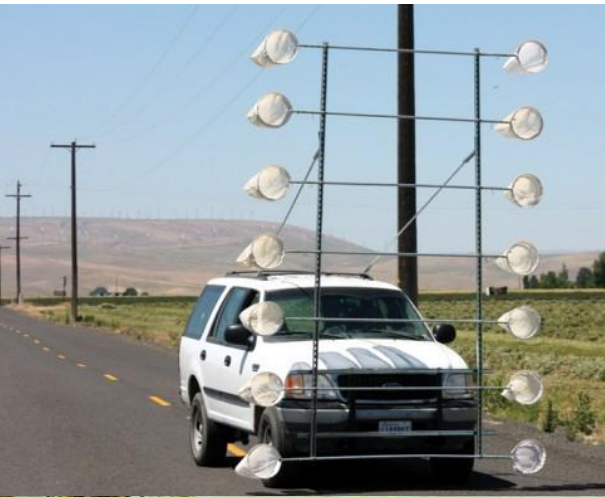
- Pollinator Protection
- Pesticide Storage Considerations
- Pesticide Spill Prevention
- Pesticide Drift Prevention
- Summary



# Pollinators and Pesticides



# The Issues



# Pesticide Issues

- Pesticide use in its relation to CCD is not completely understood.
- Sublethal effects on honey bees are being studied.
  - Further studies are needed to establish the risks, and possible link to population decline.
  - Herbicides and Fungicides need to be further researched to their possible effects on honey bee populations.



# Significant Issues



- More research is needed to determine the effects of neonicotinoids and pyrethroids on honey bees.
- Modern weed control efforts may have reduced nutrition for colony health.



# What Does This Mean?

- Pollinator Protection Is A Priority!
- Pesticides are not considered to be a direct cause of honey bee CCD.
- All pesticide applications need to consider the actions of the pollinators, not just insecticide applications.



# Protecting Pollinators





# Items to Consider

**RESTRICTED USE PESTICIDE**  
 Due to Toxicity to Fish and Aquatic Organisms  
 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.

## AMBUSH<sup>®</sup>

### INSECTICIDE

**Active Ingredient:**  
 Permethrin  
 (3-Phenoxyphenyl)methyl(2S)-cis, trans-3-(2,2-dichloroethenyl)-2,2-dimethylcyclopropanecarboxylate\* ..... 25.8%  
 Inert Ingredients ..... 74.4%  
 Total ..... 100.0%

\*Cis/trans ratio: Min 35% (s) cis and max. 65% (s) trans.  
 AMBUSH insecticide contains 2 lb. active ingredient per gallon and is an emulsifiable concentrate.

**KEEP OUT OF REACH OF CHILDREN**  
**WARNING-AVISO**

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

**FIRST AID**

If swallowed: • Call a poison control center or doctor immediately for

**Applicators and other handlers must wear:**

- Long-sleeved shirt and long pants.
- Chemical-resistant gloves, such as Barrier Laminate or Butyl Rubber ≥ 14 mils or Nitrile Rubber ≥ 14 mils or Viton ≥ 14 mils.
- Shoes plus socks.
- Protective eyewear.

**For Mushroom House Use:**

- For exposures in enclosed areas, a respirator with either an organic vapor-removing cartridge with a prefilter approved for pesticides (MSHA/NIOSH approval number prefix TC-23C), or a cartridge approved for pesticides (MSHA/NIOSH approval number prefix TC-14G).

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 170.240-170.245], 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 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 extremely toxic to fish and aquatic invertebrates. Do not apply directly to or to areas where water is present or to irreplaceable areas below the mean high water. Do not contaminate water when disposing of equipment washwaters. Do not apply in weather conditions favor drift from treated areas. Drift and runoff from treated areas be hazardous to aquatic organisms in neighboring areas.

This product is highly toxic to bees exposed to direct treatment or residues on blooming crops or weeds. Do not apply this product or allow it to drift to blooming crops or weeds if you are visiting the treatment area.

**PHYSICAL OR CHEMICAL HAZARDS**

Do not use or store near heat or open flame.

**DIRECTIONS FOR USE**

Do not use this product in a manner inconsistent with its labeling. Do not apply this product in a way that will contact workers or other persons, either directly or by drift. Only protected handlers may be in the area during application. For any additional information specific to your State or Tribe, consult the agency responsible for pesticide regulation.

- Almost all insecticides will have a negative affect on pollinators.
- Herbicides/fungicides may have a negative affect on pollinators.
- Any pesticide application must consider pollinator protection if it is appropriate



# EPA Priority

- Pesticide label changes for neonicotinoid products required for registration.
- Manufacturers needed to submit amendments to existing labels by the end of September 2013.



# Common Neonicotoids

- Clothandin
  - Aloft, Poncho, Arena, Belay, Sepresto
- Dinotefuran
  - Scorpion, Safari, Zylam, Transect, Venom
- Thiamethoxam
  - Cruiser, Actera, Platinum, Meridian, Caravan
- Imidacloprid
  - Enforce, Imidapro, Amdro, Amtide, Fortify, Exile, Admire, Gaucho, Merit, Leverage, Criterion, Premise, Centerfire, Allectus, plus lots more...



# Label Changes

- All neonicotinoid labels will have application restrictions.
- Watch for the bee hazard icon in the Directions for Use section of the label.
  - Will indicate restrictions or mandates.



Example of the label changes for pollinator protection.

## PROTECTION OF POLLINATORS



**APPLICATION RESTRICTIONS** EXIST FOR THIS PRODUCT BECAUSE OF RISK TO BEES AND OTHER INSECT POLLINATORS. FOLLOW APPLICATION RESTRICTIONS FOUND IN THE DIRECTIONS FOR USE TO PROTECT POLLINATORS.



Look for the bee hazard icon in the Directions for Use for each application site for specific use restrictions and instructions to protect bees and other insect pollinators.

**This product can kill bees and other insect pollinators.**

Bees and other insect pollinators will forage on plants when they flower, shed pollen, or produce nectar.

Bees and other insect pollinators can be exposed to this pesticide from:

- Direct contact during foliar applications, or contact with residues on plant surfaces after foliar applications
- Ingestion of residues in nectar and pollen when the pesticide is applied as a seed treatment, soil, tree injection, as well as foliar applications.

When Using This Product Take Steps To:

- Minimize exposure of this product to bees and other insect pollinators when they are foraging on pollinator attractive plants around the application site.
- Minimize drift of this product on to beehives or to off-site pollinator attractive habitat. Drift of this product onto beehives or off-site to pollinator attractive habitat can result in bee kills.

Information on protecting bees and other insect pollinators may be found at the Pesticide Environmental Stewardship website at:

<http://pesticidestewardship.org/PollinatorProtection/Pages/default.aspx>.

Pesticide incidents (for example, bee kills) should immediately be reported to the state/tribal lead agency. For contact information for your state, go to: [www.aapco.org/officials.html](http://www.aapco.org/officials.html). Pesticide incidents should also be reported to the National Pesticide Information Center at: [www.npic.orst.edu](http://www.npic.orst.edu) or directly to EPA at: [beekill@epa.gov](mailto:beekill@epa.gov)



## DIRECTIONS FOR USE

# Example of the label changes for pollinator protection.



### 1. FOR CROPS UNDER CONTRACTED POLLINATION SERVICES

Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless the following condition has been met.

If an application must be made when managed bees are at the treatment site, the beekeeper providing the pollination services must be notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying.

### 2. FOR FOOD CROPS AND COMMERCIALY GROWN ORNAMENTALS NOT UNDER CONTRACT FOR POLLINATION SERVICES BUT ARE ATTRACTIVE TO POLLINATORS



Do not apply this product while bees are foraging. Do not apply this product until flowering is complete and all petals have fallen unless one of the following conditions is met:

- The application is made to the target site after sunset
- The application is made to the target site when temperatures are below 55°F
- The application is made in accordance with a government-initiated public health response
- The application is made in accordance with an active state-administered apiary registry program where beekeepers are notified no less than 48-hours prior to the time of the planned application so that the bees can be removed, covered or otherwise protected prior to spraying
- The application is made due to an imminent threat of significant crop loss, and a documented determination consistent with an IPM plan or predetermined economic threshold is met. Every effort should be



# Pesticide Storage



# Proper Storage Safeguards...

- Ground
- Water
- Yourself and Others



University of Idaho  
Extension





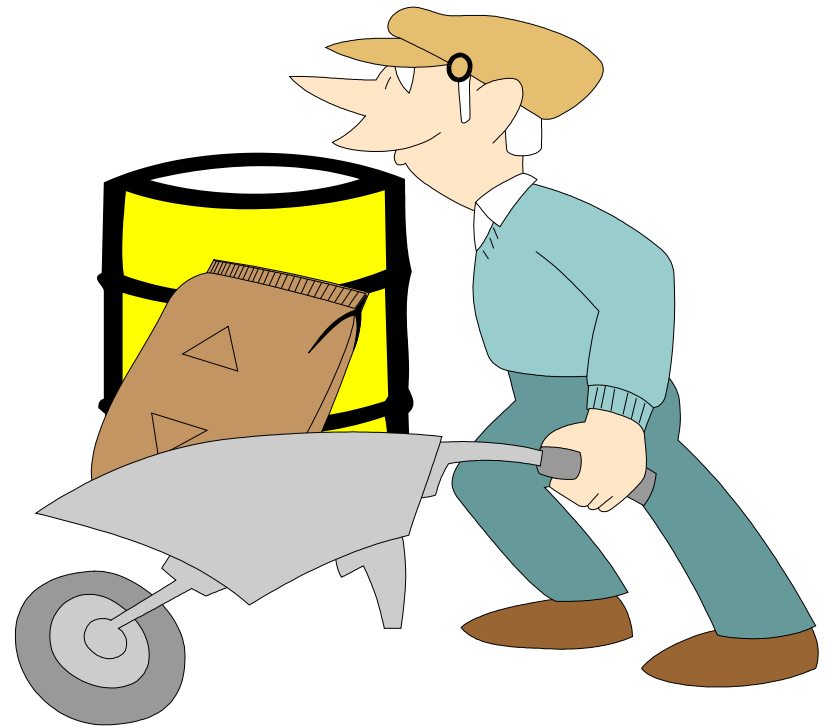
# Considerations

- Applicable Law
- General Rules
- Type of Pesticide
- Location of Storage Area
- Safety



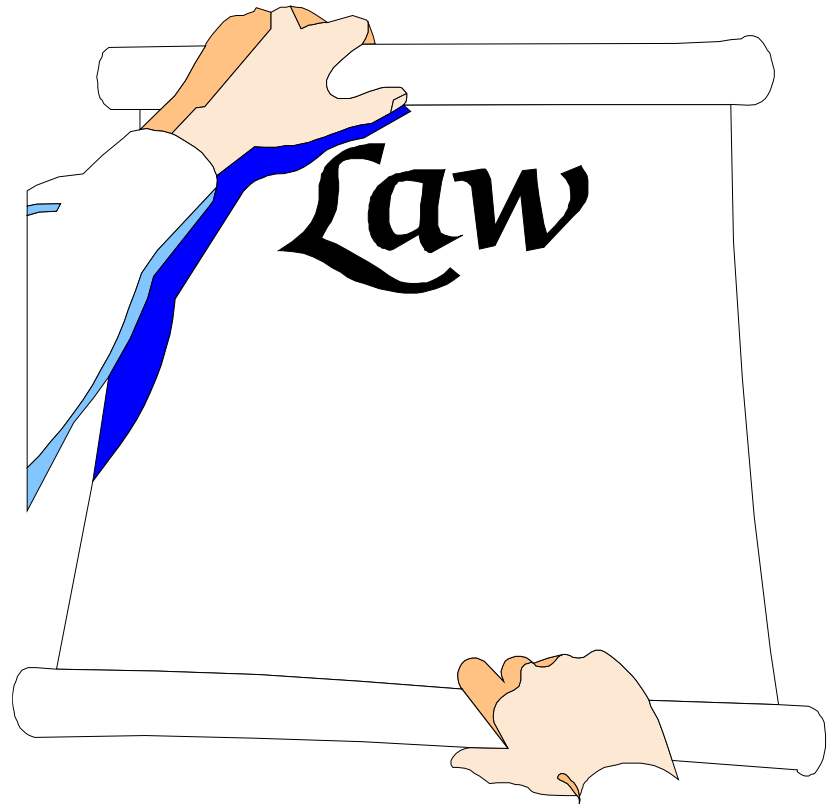
# Best Storage - Don't Store!

- Determine the amount of pesticide needed for the application.
- Resist the urge to over purchase.
- Use all chemicals during one season.



# Idaho Law

- Properly Marked
- Separated
  - Food, Feed, Vet Supplies
  - Humans
  - Pets
  - Livestock
  - PPE



# Idaho Law

- Applicable Safety Equipment
- Secured from intrusion



# Idaho Law

- Fire Extinguishers must be present when storing flammable formulations.
- Original container, original label.
- Containers - sealed with container in good condition.



# Storage

- All Class I Storage Facilities must have:



# Spill Prevention



# Prevention



- Be prepared to handle a spill before you handle the pesticide.
- Develop Spill Prevention Guidelines.
  - Where/How to load pesticides.
  - Where/How to mix pesticides.
  - How to transport pesticides.
  - Equipment guidelines.





# Pouring and Measuring



Extension



# High Risk Procedures



- Filling, mixing and loading operations performed away from a mix/load facility or done on-site.
- Transportation of concentrates or tankmix.
- Operations around water.
- Operations in urban or semi-urban areas.



# Mix/load Operations



- Mixing, loading or transferring on site without a pad.
  - Choose the appropriate location.
  - Use tarps or other materials to contain or soak up any spills.
  - Have water and cleaning materials on hand.



# Transportation



- Choose route that are appropriate.
- Factor high-traffic roads or high-risk routes.
- Avoid high-density traffic areas and times.



# Around Water

- Mix/load operations away from the water.
- Provide adequate buffer for the application.
- Use hand application to reduce large volumes of tankmix near the water.



# Urban/Semi-Urban Areas

- Mix/load away from application site.
- Keep operations as small as possible.
- Plan the operations so that minimum time is on site.
- Keep people away from operations.

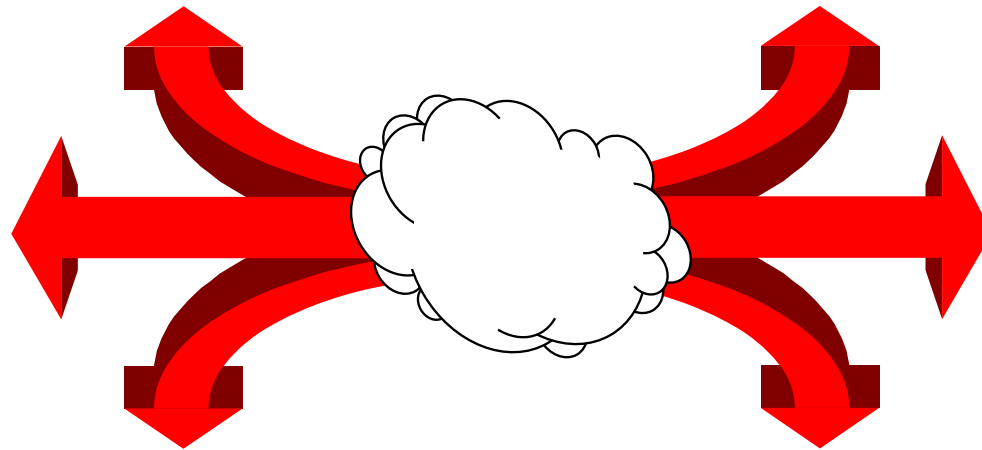


# Minimizing Spray Drift and Spray Drift Damage



# What is Drift?

- Movement of spray particles and vapors off-target causing less effective control and possible injury to susceptible vegetation and wildlife.



*Adapted from National Coalition on Drift Minimization 1997 as adopted from the AAPCO Pesticide Drift Enforcement Policy - March 1991*





# Types of Spray Drift

- Vapor - associated with volatilization, gases, fumes.
- Particle - off-target movement of spray droplets.



# Drift Concerns

- Spotty pest control.
- Wasted chemicals.
- Off-target damage.

**Result -  
Higher Costs.**

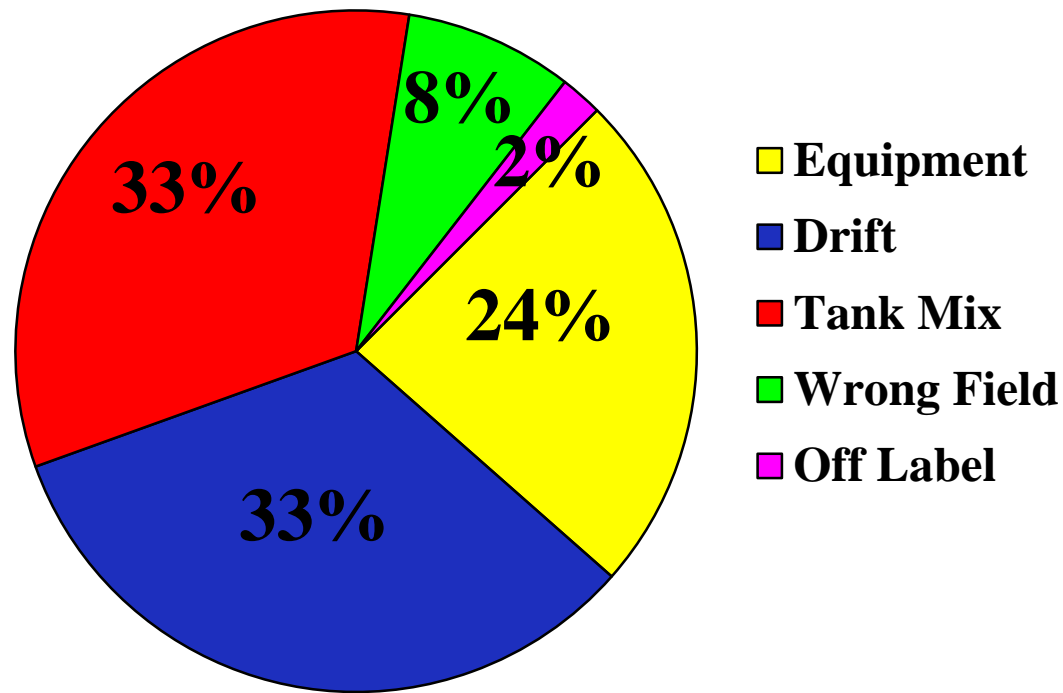


# Drift Concerns

- Environmental impact.
  - Water, Soil and Air Quality
- Residential encroachment of farmland.
- Public more aware of pesticide concerns!  
(Negative!!!)



# Misapplication Facts

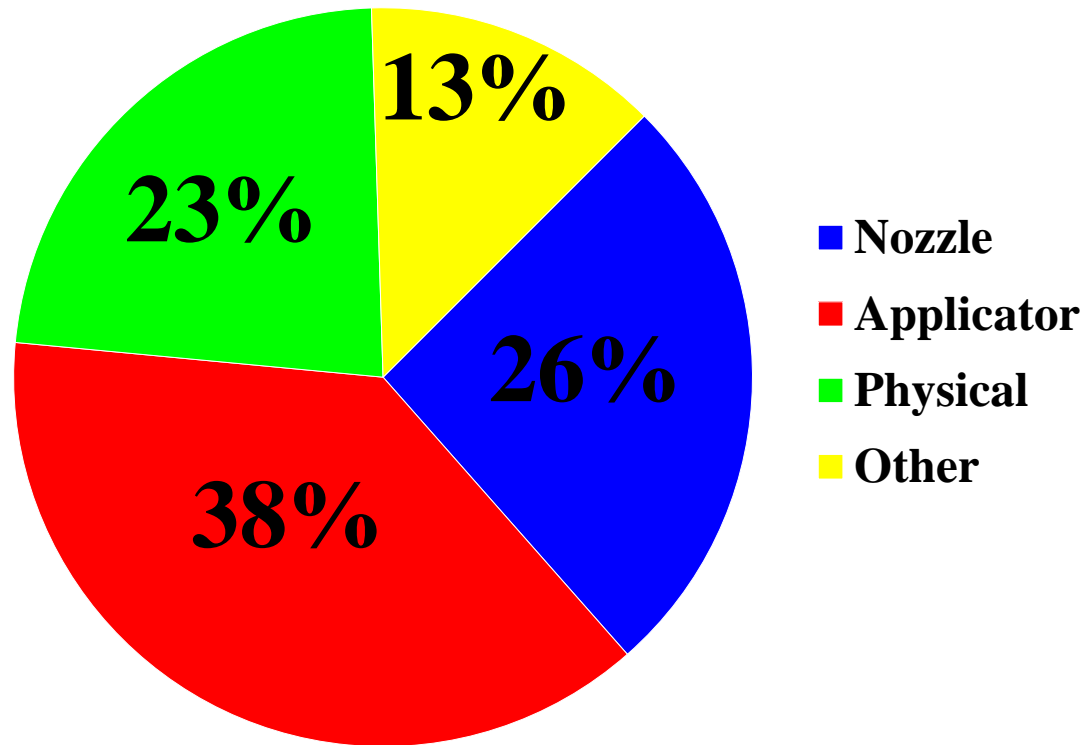


Source: Farmland Insurance

University of Idaho  
Extension



# Contributions to Drift



# Strategies to Reduce Drift

- Select nozzle to reduce fine droplets (driftable).
- Increase flow rates - higher application volumes.
- Use lower pressures.



# Strategies to Reduce Drift

- Use lower spray (boom) heights.
- Avoid adverse weather conditions.
- Consider using buffer zones.



# Strategies to Reduce Drift

- Consider using new technologies:
  - drift reduction nozzles.
  - drift reduction additives.
  - shields, electrostatics, air-assist.





# Products of Concern





# Fumigant Concerns

- Respiratory protection is essential!
- Pressurized liquids and gasses containers can rupture.
- Liquids can volatilize.
- Solids react with water (AIP).



# Insecticides

- Normally liquid concentrates
- Many work on the nervous system of insects and can affect human nervous systems.
- Many are flammable.
- Many contain solvents.

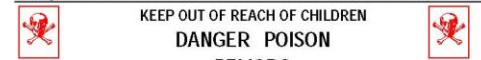
**RESTRICTED USE PESTICIDE**  
 DUE TO ACUTE ORAL TOXICITY and TO GROUND WATER CONTAMINATION  
Permitted sale to and use only by Certified Applicators or persons under the direct supervision of a Certified Applicator, and only for those uses covered by the Certified Applicator's certification.

## TEMIK® brand 15G ALDICARB PESTICIDE

For Control of Certain Insects, Mites, and Nematodes

ACTIVE INGREDIENT: Aldicarb [2-methyl-2-(methylthio) propionaldihydride 2-(methylcarbamoyloxyimide)] ..... 14%  
 INERT INGREDIENTS ..... 86%

EPA Reg. No. 264-330 EPA Est. No. 264-GA-01



**KEEP OUT OF REACH OF CHILDREN**  
**DANGER POISON**  
**PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en detalle.  
 (If you do not understand the label, find someone to explain it to you in detail.)  
 For MEDICAL AND TRANSPORTATION Emergencies ONLY Call 24 Hours A Day 1-800-334-7577  
 For PRODUCT USE Information Call 1-866-999-BAYER (1-866-992-2937)

FIRST AID	
IF SWALLOWED:	<ul style="list-style-type: none"> <li>• Immediately call a poison control center or doctor for treatment advice.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
IF IN EYES:	<ul style="list-style-type: none"> <li>• Hold eyes open and rinse slowly and gently with water for 15-20 minutes.</li> <li>• Remove contact lenses, if present, after the first 5 minutes, then continue rinsing.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
IF ON SKIN OR CLOTHING:	<ul style="list-style-type: none"> <li>• Take off contaminated clothing.</li> <li>• Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>• Call a poison control center or doctor for treatment advice.</li> </ul>
IF INHALED:	<ul style="list-style-type: none"> <li>• Move person to fresh air.</li> <li>• If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably mouth-to-mouth if possible.</li> </ul>



## SEVIN® brand XLR PLUS Carbamyl Insecticide

For Agricultural or Commercial Use Only

ACTIVE INGREDIENT: Carbaryl (1-naphthyl N-methylcarbamate) ..... 44.1% by wt.  
 INERT INGREDIENTS ..... 55.9% by wt.  
 (Contains 4 Pounds Carbaryl Per Gallon)

E.P.A. Reg. No 264-333 E.P.A. Est. No. 264-MO-02

**KEEP OUT OF REACH OF CHILDREN**  
**CAUTION**

For MEDICAL AND TRANSPORTATION Emergencies ONLY Call 24 Hours A Day 1-800-334-7577  
 For PRODUCT USE Information Call 1-866-999-BAYER (1-866-992-2937)

FIRST AID	
<small>Carbamyl is an N-Methyl Carbamate Insecticide.</small>	
IF SWALLOWED:	<ul style="list-style-type: none"> <li>• Immediately call a poison control center or doctor for treatment advice.</li> <li>• Do not induce vomiting unless told to do so by a poison control center or doctor.</li> <li>• Have person sip a glass of water if able to swallow.</li> <li>• Do not give anything by mouth to an unconscious person.</li> </ul>
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Have the product container or label with you when calling a poison control center or doctor or going for treatment.  
 GENERAL: Contact a physician immediately in all cases of suspected poisoning. Transport to a physician or hospital immediately and SHOW A COPY OF THIS LABEL TO THE PHYSICIAN. If poisoning is suspected in animals, contact a veterinarian.

**ANTIDOTE STATEMENT**  
 ATROPINE SULFATE IS HIGHLY EFFECTIVE AS AN ANTIDOTE. Narcotics and other sedatives should not be used. Further, drugs like 2-PAM (pyridine-2-aldoxime methiodide) are NOT recommended. See NOTE TO PHYSICIAN.

**NOTE TO PHYSICIAN**  
 Treat symptomatically. Overexposure to materials other than this product may have occurred. Carbaryl is an N-methyl carbamate insecticide, which is a cholinesterase inhibitor. Overexposure to this substance may cause toxic signs and symptoms due to stimulation of the cholinergic nervous system. These effects of overexposure are spontaneously and rapidly reversible. Gastric lavage may be used if this product has been swallowed. Carbaryl poisoning may occur rapidly after ingestion and prompt removal of stomach contents is indicated. Specific treatment consists of parenteral atropine sulfate. Caution should be maintained to prevent over atropinization. Improve tissue oxygenation as much as possible before administering atropine to minimize the risk of ventricular fibrillation. Mild cases may be given 1



# Insecticide Concerns

- Flammables may ignite – toxic fumes
- May be readily absorbed through the skin.
- Protection of skin (gloves/boots, coveralls) and eyes (safety glasses) is essential.



# Herbicides

- Generally liquid concentrates
- Normally lower in toxicity
- Can be caustic or a strong irritant
- Can contaminate soil and water
- Will be a problem for plants

PULL HERE TO OPEN ▶

**RESTRICTED USE PESTICIDE**  
**DUE TO ACUTE TOXICITY**  
FOR RETAIL SALE TO AND USE ONLY BY CERTIFIED APPLICATORS OR PERSONS UNDER THEIR DIRECT SUPERVISION AND ONLY FOR THOSE USES COVERED BY THE CERTIFIED APPLICATOR'S CERTIFICATION.





**Herbicide**  
 A Weed, Grass, and Harvest Aid Desiccant/Defoliant Herbicide

**Active Ingredient:**  
 Paraquat dichloride (1,1'-dimethyl-4,4'-bipyridinium dichloride) 30.1%  
 Other Ingredients: 69.9%  
**Total: 100.0%**

Contains 2.0 pounds paraquat cation per gallon as 2.767 pounds salt per gallon.  
 Contains alerting agent (odor, emetic, dye and inkjet technology).

**KEEP OUT OF REACH OF CHILDREN.  
 DANGER / PELIGRO**   
**POISON**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en español.

**2,4-D L.V. 4 ESTER**  
 A selective weed killer

For control of many broadleaf weeds and brush control in corn, small grains, soybean (preplant only) and other listed crops and in non-crop areas such as fence rows, lawns, pastures, rangelands, and rights-of-way.

**ACTIVE INGREDIENT:**  
 Isooctyl (2-ethylhexyl) Ester of 2,4-Dichlorophenoxyacetic Acid\* .....67.2%  
**OTHER INGREDIENTS:** ..... 32.8%  
**TOTAL:** .....100.0%

Contains Petroleum Distillates

Isomer Specific AOCAG Method, Equivalent to:  
 \*2,4-Dichlorophenoxyacetic Acid ..... 44.6%, 3.84 lbs./gal

**KEEP OUT OF REACH OF CHILDREN  
 DANGER / PELIGRO**

Si usted no entiende la etiqueta, busque a alguien para que se la explique a usted en español. If you do not understand the label, find someone to explain it to you in detail.  
 SEE INSIDE BUCKET FOR FIRST AID AND ADDITIONAL PRECAUTIONARY STATEMENTS

EPA Reg. No. 228-139

Manufactured for Nufarm Americas Inc., 150 Harvester Drive, Burr Ridge, IL 60527

For Chemical Spill, Leak, Fire, or Exposure, Call CHEMTREC (800-424-9300)  
 For Medical Emergencies Only, Call (877) 325-1840





# Herbicide Concerns

- Gloves, coveralls and eye protection is essential.
- Do not use excessive water; may contaminate soil and ground water.
- Some herbicides volatile at high temperatures.



# Drift Considerations

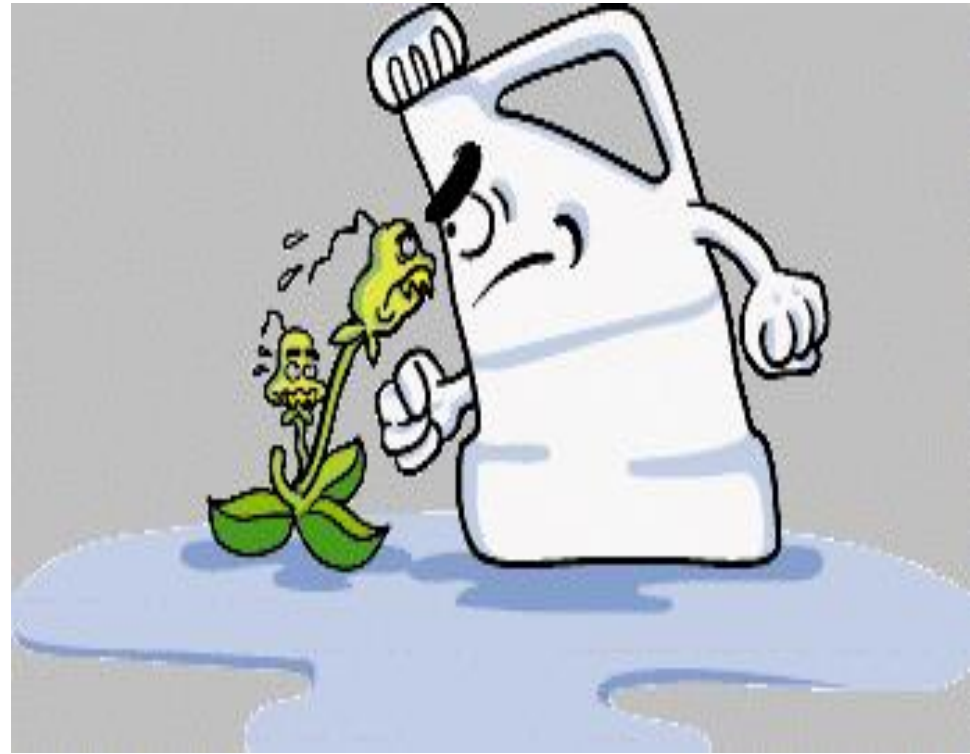
- Drift is a significant concern to applicator and public.
- Consider all factors before application.
  - Environmental
  - Equipment
  - Chemical
  - Formulation





# Drift Considerations

- Newer technologies, adjuvants, and application techniques can significantly reduce drift.
- Environmental impact (Clean Water Act) can be costly.



# Summary



# Questions?

# Thank You!

