

Protecting Water Quality with Agricultural Best Management Practices (BMPs)



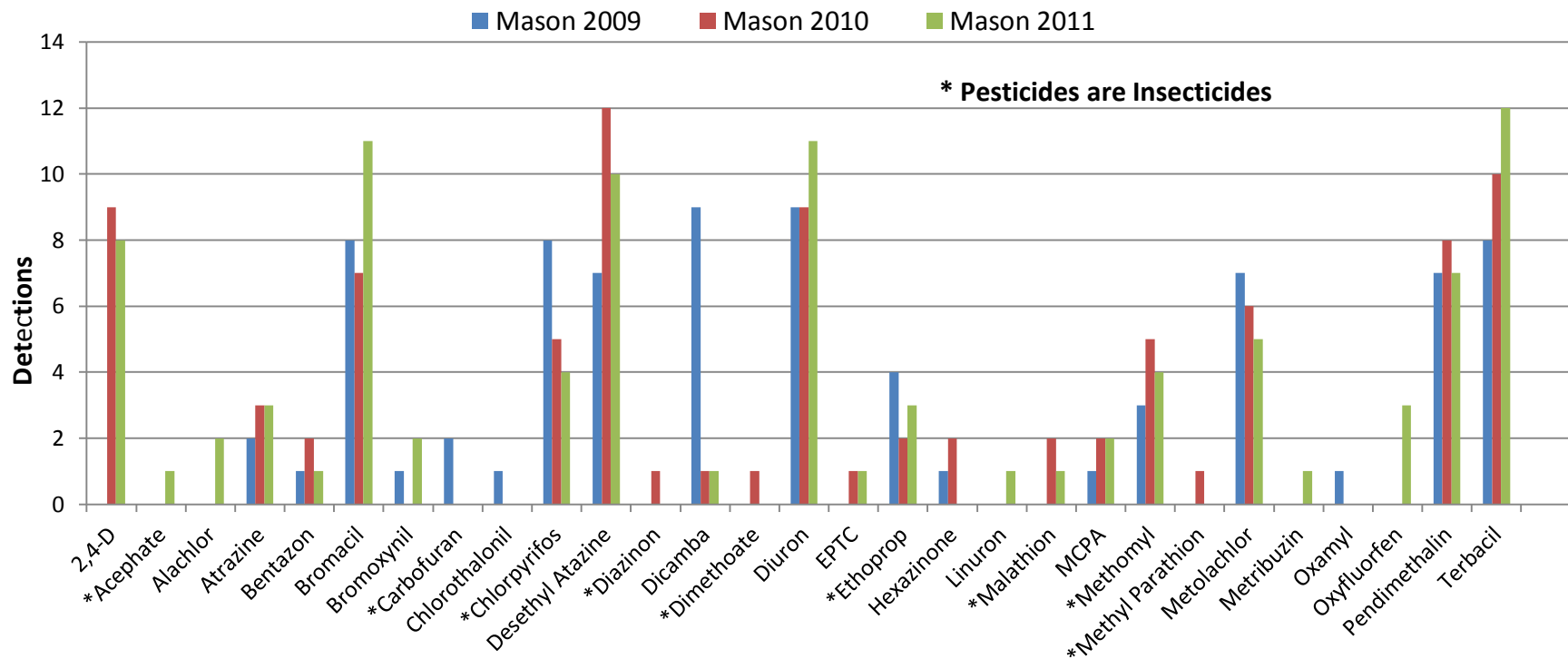
Photo courtesy of Joel Sartore, National Geographic

So what's the big deal?



ISDA Surface Water Pesticide Detections That Exceed 50% of an EPA Aquatic Benchmarks

Pesticide	Projects and Years	Counties
Bromoxynil	Boat Dock Drain Weiser Flat 2007	Washington
Chlorpyrifos	Weiser Flat (2007) Jenkins Creek, Scott Creek, and Warm Springs Creek. S-Drains Payette River (2007), Lower Boise Tributaries (2009) Mason Creek and Fifteenmile Creek. Lower Boise Tributaries (2010) Conway Gulch, Mason Creek, and Fifteenmile. Lake Lowell Drains (2010). Lower Boise Tributaries (2011) Fifteenmile, Tenmile and Fivemile Creeks. Lower Boise Tributaries (2011) Mason Creek, Solomon Drain, Noble Drain, and Purdum Gulch.	Washington, Canyon and Payette
Diazinon	Lower Boise Tributaries (2011) Fivemile Creek.	Ada, Canyon
Dichlorvos	Lake Lowell Drains (2010).	Canyon
Dimethoate	Payette River S-Drains (2008), Clearwater Tributaries (2011) Catholic Creek.	Washington, Nez Perce
Diuron	Lower Boise Tributaries (2011) Solomon Drain and Noble Drain.	Canyon
Ethoprop	Lower Boise Tributaries (2009) Mason Creek and Fifteenmile Creek. Lower Boise Tributaries (2010) Mason Creek and Fifteenmile Creek. Lower Boise Tributaries (2011) Tenmile Creek. Lower Boise Tributaries (2011) Mason Creek, Solomon Drain, and Purdum Gulch.	Ada, Canyon
Linuron	Clearwater River Tributaries (2006) Catholic Creek. Clearwater River Tributaries (2011) Catholic Creek, Potlatch River, and Pine Creek. Lake Lowell Drains (2010). Lower Boise Tributaries (2011) Tenmile Creek and Lower Boise Tributaries (2011) Mason Creek, and Solomon Drain	Nez Perce, Ada, Canyon
Malathion	Payette River S-Drains (2008). Weiser Flat (2007) Boat Dock Drain. Lower Boise River (2010), Mason Creek (2010), and Conway Gulch (2010). Lower Boise Tributaries (2011) Mason Creek, Solomon Drain, and Purdum Gulch.	Payette, Washington, Canyon
Methidathion	Lower Boise River Tributaries (2010) Conway Gulch.	Canyon
Methomyl	Clearwater River Tributaries (2006) Big Canyon Creek. Succor Creek and Sage Creek (2009). Weiser Flat (2007) Jenkins Creek, Scott Creek, and Warm Springs Creek. Lake Lowell Drains (2010). Lower Boise Tributaries (2010) Conway Gulch and Mason Creek. Lower Boise Tributaries (2011) Purdum Gulch.	Nez Perce, Lewis, Owyhee, Canyon, Washington
Methyl Parathion	Weiser Flat (2007) Jenkins Creek, Warm Springs Creek, and Boat Dock Drain.	Washington
Metolachlor	Lake Lowell Drains (2010). Lower Boise River Tributaries (2011) Purdum Drain.	Canyon
Oxyfluorfen	Lower Boise River Tributaries (2010) Conway Gulch.	Canyon



ISDA's Pesticide Results for Mason Creek
Monitoring conducted in 2009, 2010, and 2011



Pesticides Detected in Ada and Canyon Counties Ground Water

Pesticides Most Frequently Detected in Ada and Canyon County Ground Water

Atrazine, Atrazine Desethyl

Aldicarb Sulfone

Bentazon

Bromacil

Dacthal (DCPA)

Diuron

Metolachlor

Metribuzin

Simazine

Terbacil

Tebuthiuron

1,2,3-Trichloropropane

Agricultural pesticide use and good water quality can be compatible.

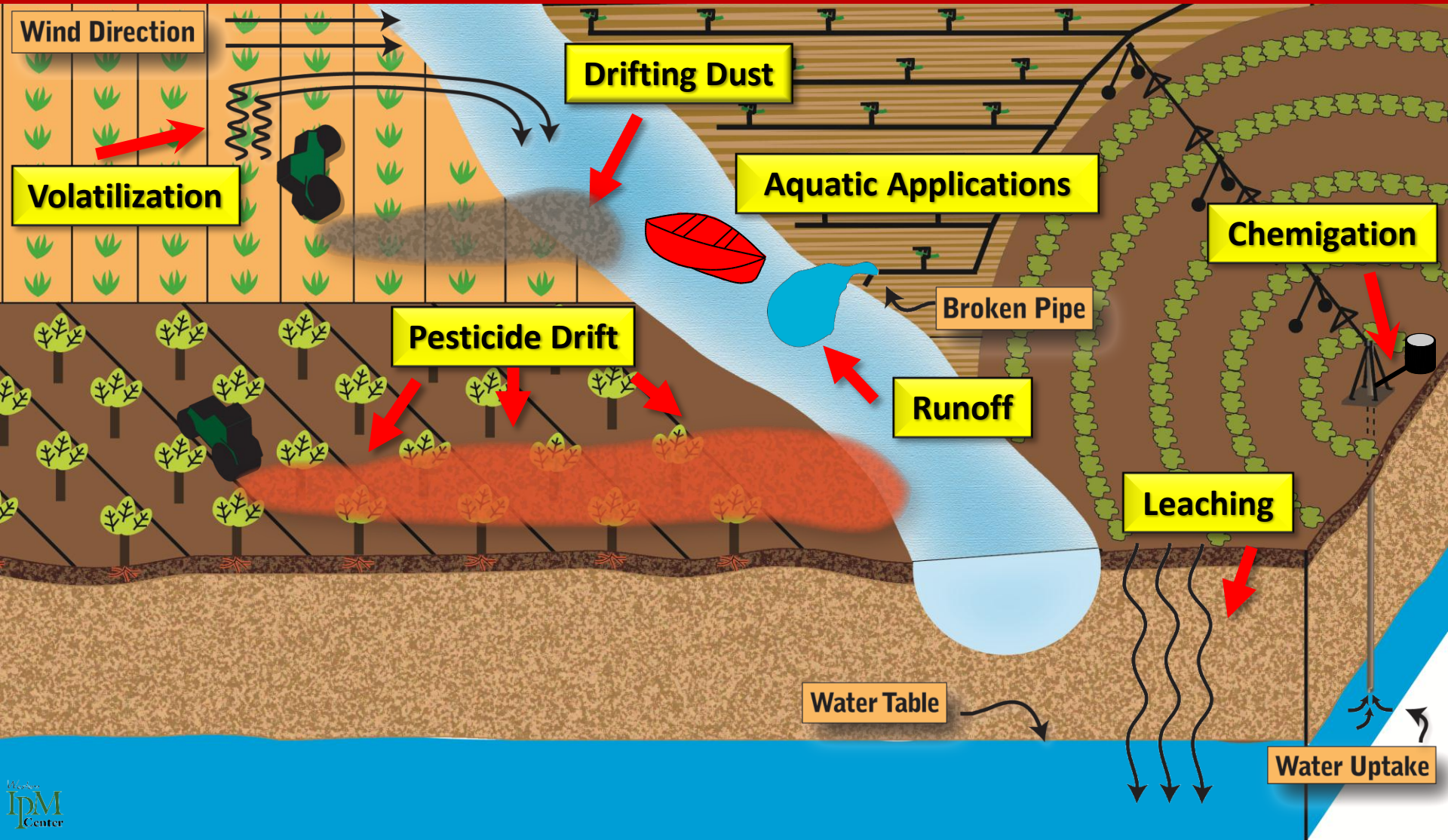




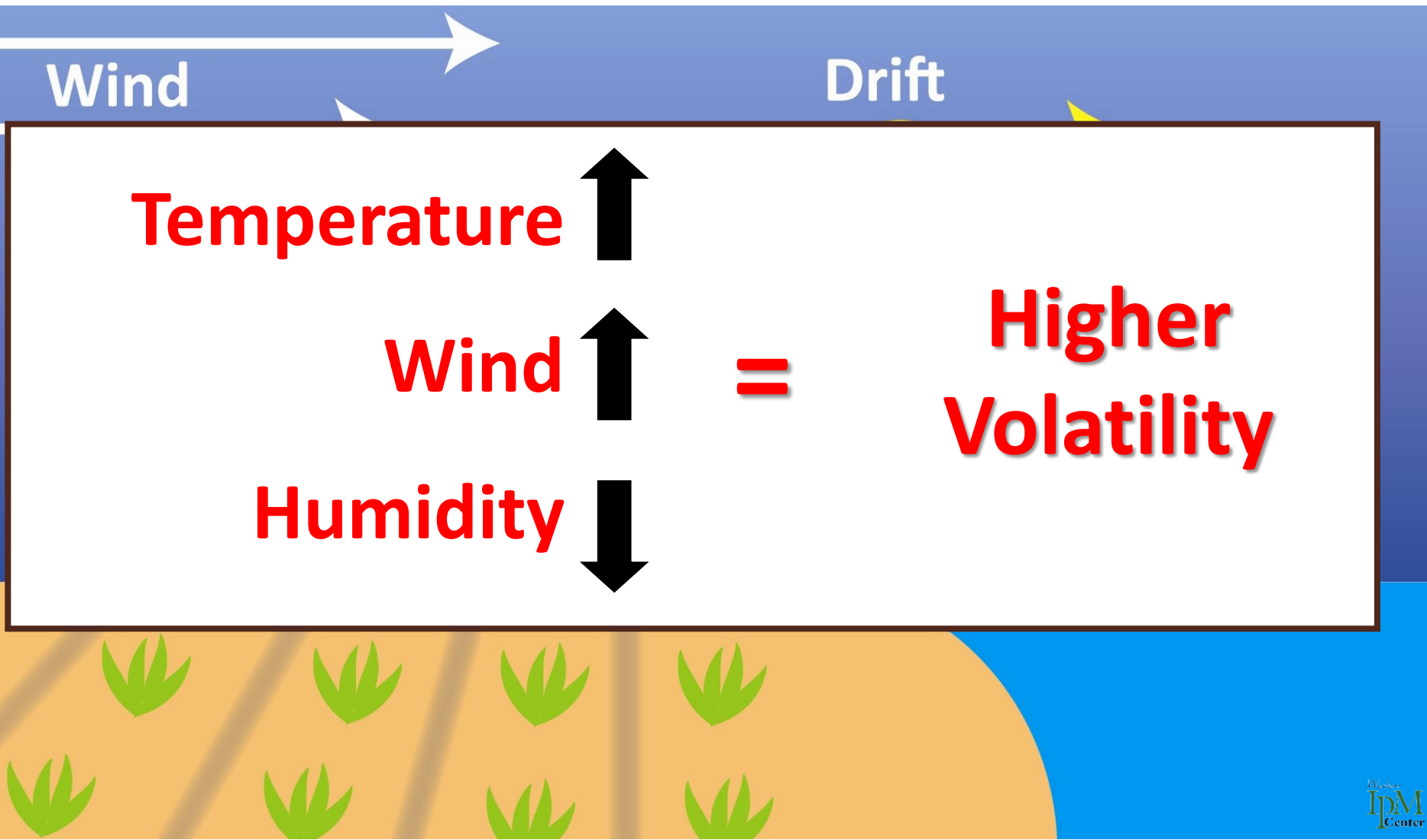
Photo courtesy of gmeador

How can
pesticides get
into water?

There are several ways that pesticides get into water.



Pesticides can move to water through volatilization or vapor drift.



In windy conditions, pesticides can be carried off site attached to soil particles.



Photo courtesy of Idaho NRCS

During pesticide applications, sprays can be carried into water.



Photo courtesy of Steve Castagnoli, OSU

Runoff and erosion can move pesticides off site.



Pesticides can leach into the water table.

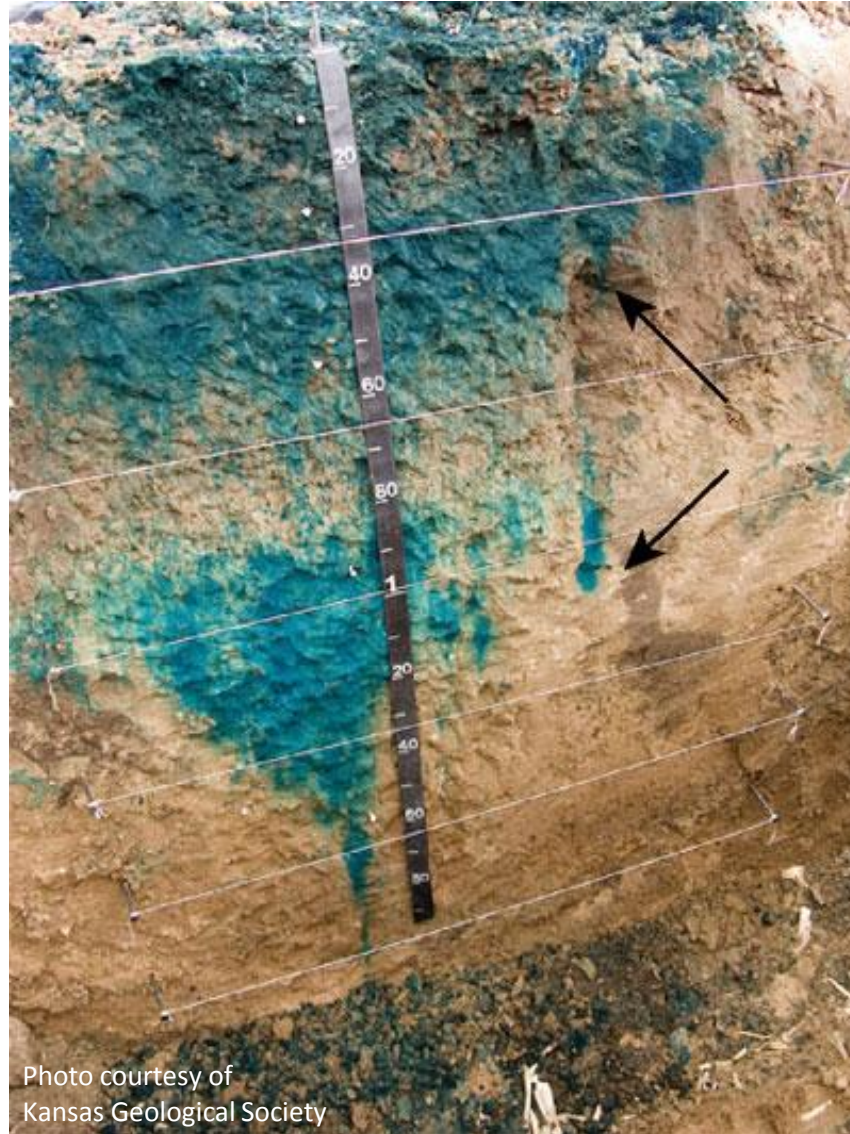


Photo courtesy of
Kansas Geological Society

Improper pesticide handling can
contaminate water.



Pesticides sometimes get in water through intentional, direct application.



Photo courtesy of UCIPM

Weather conditions impact pesticide movement.



Excessive or untimely rainfall can affect pesticide movement.



Wind direction and speed can cause off-site pesticide movement.





Photo courtesy of nordique, Peter Stevens

Soil
characteristics
and pesticide
properties
influence off-site
movement of
pesticides.

Photo courtesy of USDA-NRCS

Soil Characteristics: Soil texture and structure impact how pesticides move in soil.



Soil organic matter and pH affect how tightly pesticides bind to soil.



Photo courtesy of USDA-NRCS

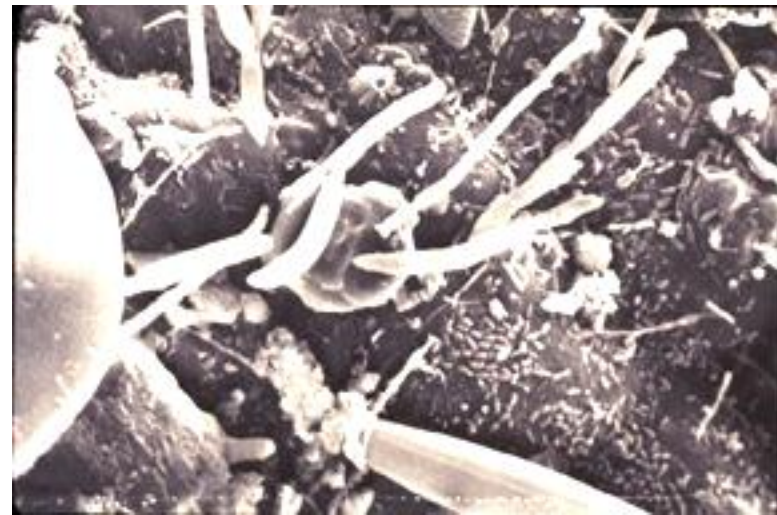
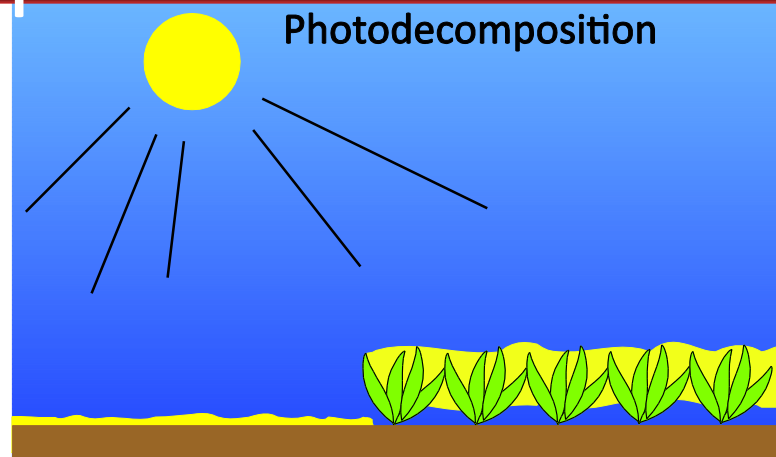
Deeper soil lessens the potential for pesticide leaching.



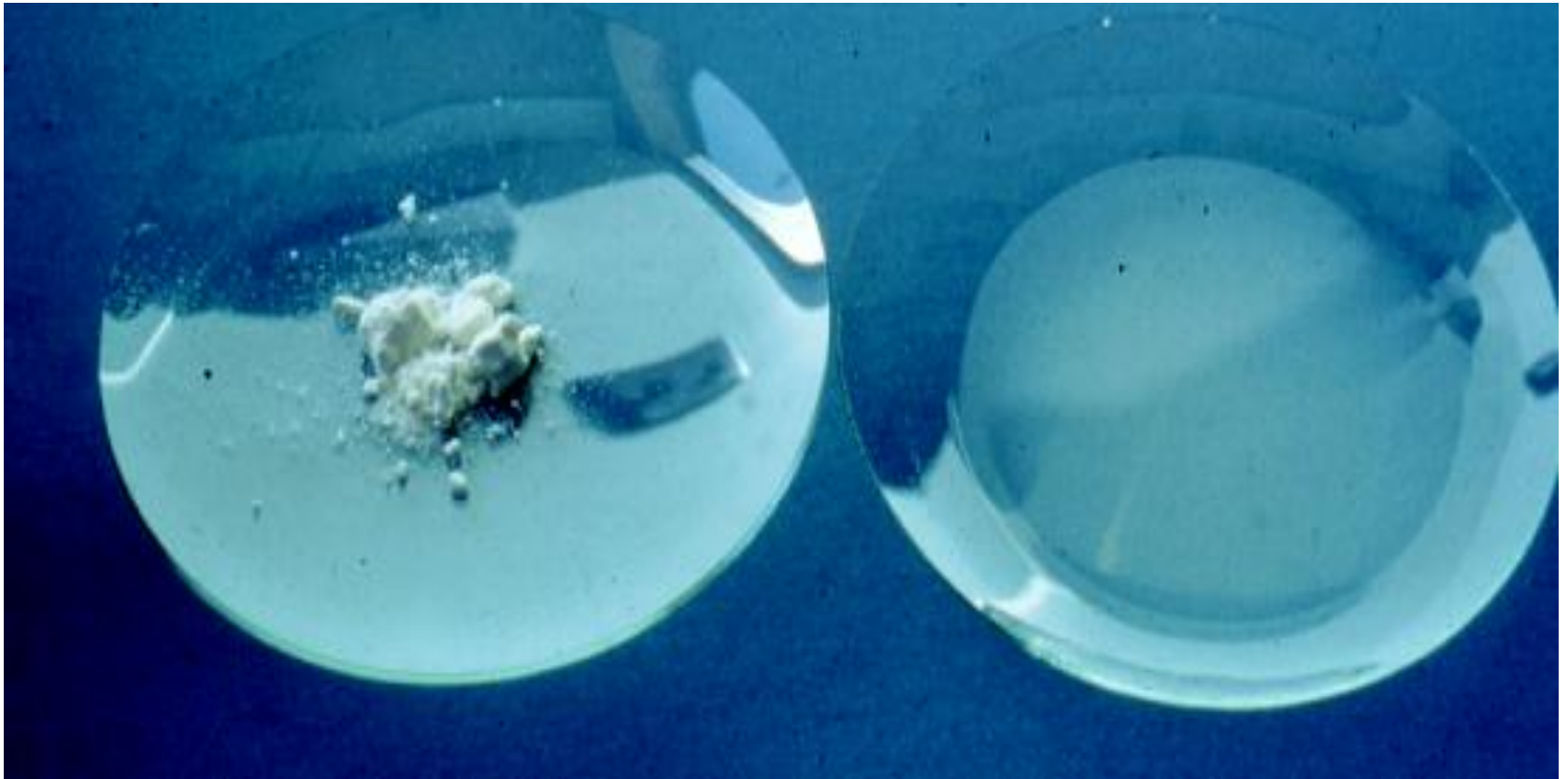
Photo courtesy of USDA-NRCS

Pesticide Properties: Pesticides are degraded in the environment by microorganisms, sunlight, and chemical processes.

Hydrolysis
occurs
at
high pH.



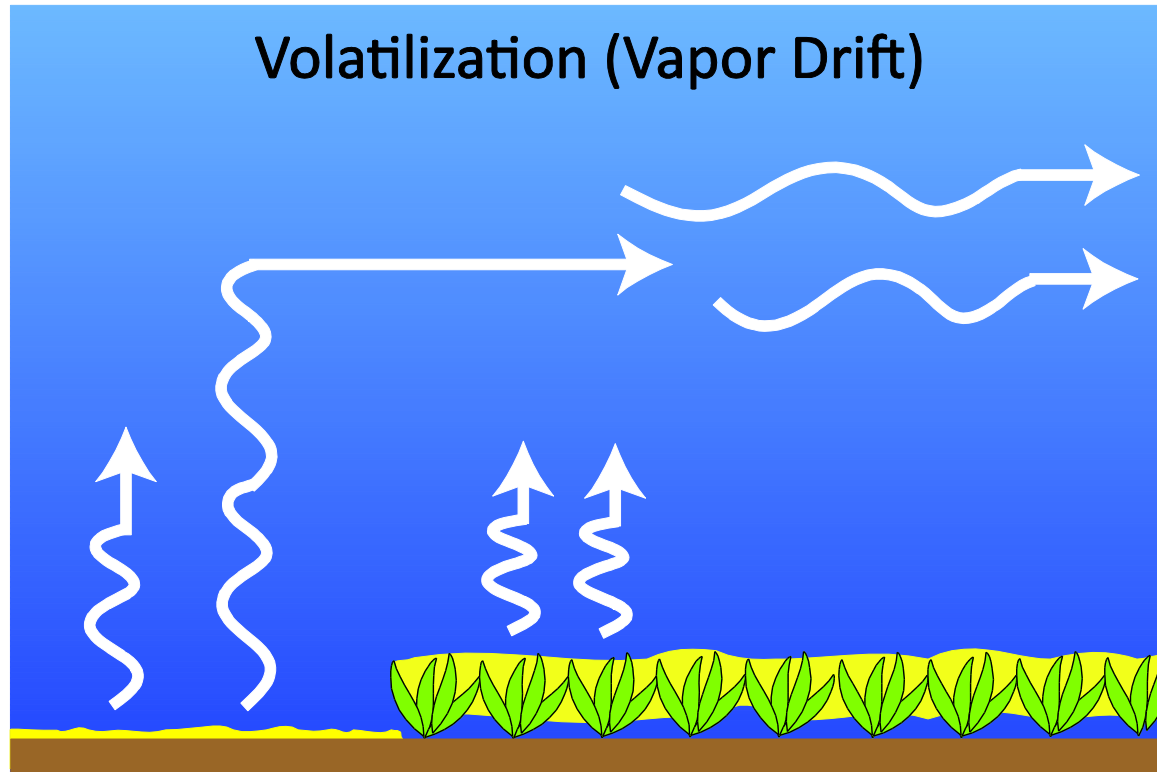
Water-soluble pesticides are more likely to move with water.



Persistence is the measure of how long a pesticide remains active before it degrades.



Volatile pesticides can move long distances off site.



Best Management Practices (BMPs) to Protect Water Quality



Photo courtesy of USDA-NRCS

Integrated Pest Management (IPM) is one of the best ways to protect water.



Scout to determine pest pressure and the presence of beneficial insects.



Photo courtesy of USDA-NRCS

Use IPM (i.e., biological, cultural, and mechanical practices) to manage pests.



Carefully select pesticides to protect water.



Before selecting a pesticide, use pesticide risk assessment tools.





Protect beneficial organisms with proper timing of pesticide applications.

Rotate pesticides to avoid pesticide resistance.



Use irrigation water management to reduce pesticides in water.



Photo courtesy of Troy Peters, WSU

Use anti-siphon devices to prevent pesticide contamination in wells.



Select the appropriate type of irrigation for your situation.



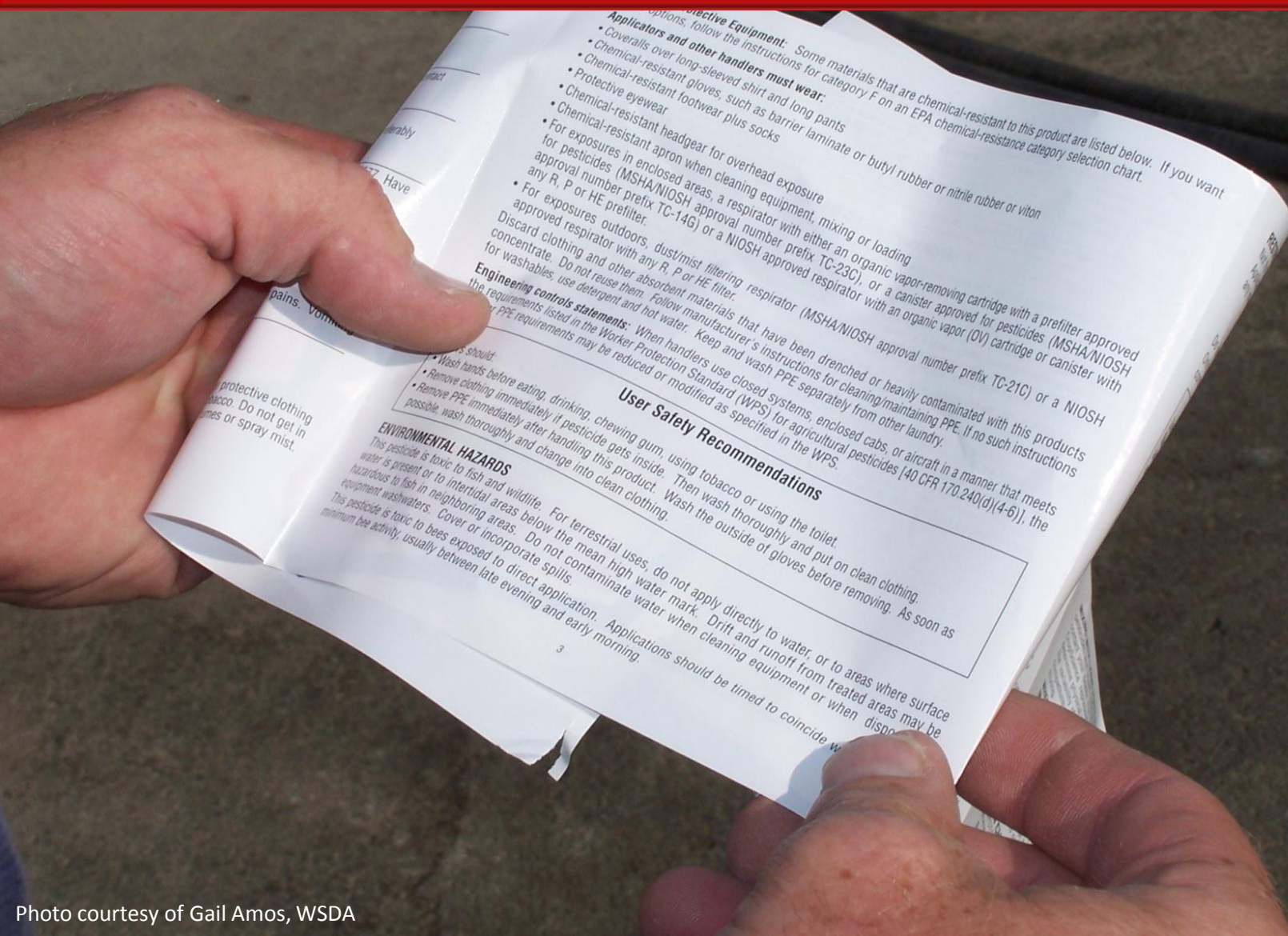
Photo courtesy of USDA-NRCS



Photos courtesy of Troy Peters, WSU

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Use proper application methods to reduce off-site movement of pesticides.



Protective Equipment: Some materials that are chemical-resistant to this product are listed below. If you want options, follow the instructions for category F 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 butyl rubber or nitrile rubber or viton
- Protective footwear plus socks
- Chemical-resistant headgear for overhead exposure
- 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 canister approved for pesticides (MSHA/NIOSH approval number prefix TC-14G) or a NIOSH approved respirator with an organic vapor (OV) cartridge or canister with any R, P or HE prefilter.
- For exposures outdoors, dust/mist filtering respirator (MSHA/NIOSH approval number prefix TC-21C) or a NIOSH approved respirator with any R, P or HE filter.

Engineering controls statements: 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 requirements for PPE may be reduced or modified as specified in the WPS.

User Safety Recommendations

- Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Then wash thoroughly and put on clean clothing.
- Remove clothing immediately if pesticide gets inside. 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 and wildlife. For terrestrial uses, 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 fish in neighboring areas. Do not contaminate water when cleaning equipment or when disposing of equipment washwaters. Cover or incorporate spills.

This pesticide is toxic to bees exposed to direct application. Applications should be timed to coincide with minimum bee activity, usually between late evening and early morning.



Photo courtesy of USDA-NRCS

Do not apply
pesticides
near sensitive
areas.

Always calibrate and maintain pesticide application equipment.



Photo courtesy of USDA-NRCS

Regularly inspect pesticide equipment and keep it in good repair.

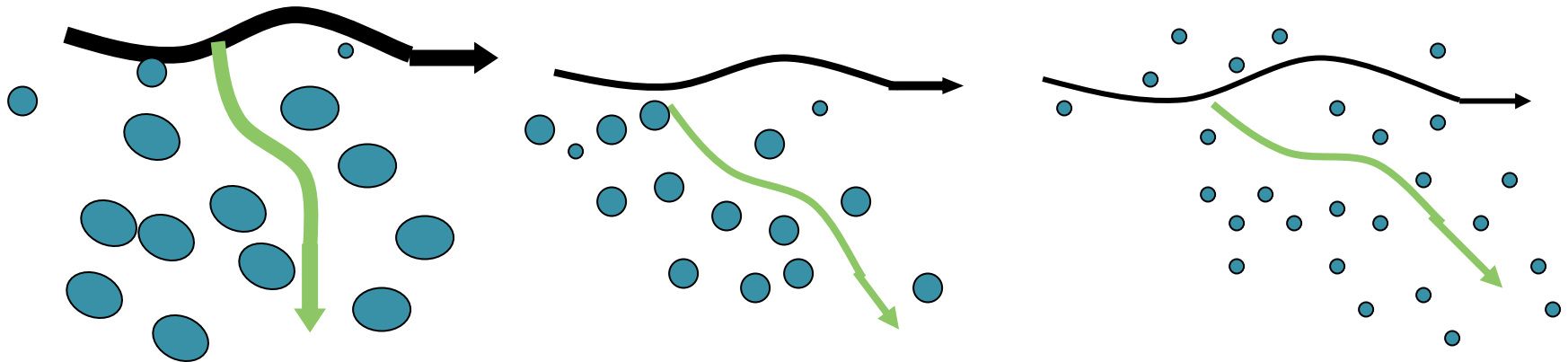


Reduce the potential for pesticide movement to sensitive areas by preventing drift.



Photo courtesy of USDA-NRCS

Select appropriate nozzle size to reduce the potential for drift.



The **larger** the spray droplet size
The less distance the droplet drifts

Practice proper pesticide mixing, loading, storage, and disposal to protect water resources.



Always dispose of unwanted pesticides and empty containers properly.



Do not fill spray tanks near a wellhead.



Photo courtesy of M.J. Weaver, pesticidepics.org (Virginia Tech)

Mix and load
pesticides on
impermeable
sites.



Always store pesticides in secure locations to avoid pesticide spills and contamination.



Photos courtesy of Wayne Buhler, NC State

Use practices to reduce runoff and erosion.



Photo courtesy of USDA-NRCS

Use constructed wetlands to collect contaminated sediment.



Use products such as PAM to avoid runoff-generated erosion.

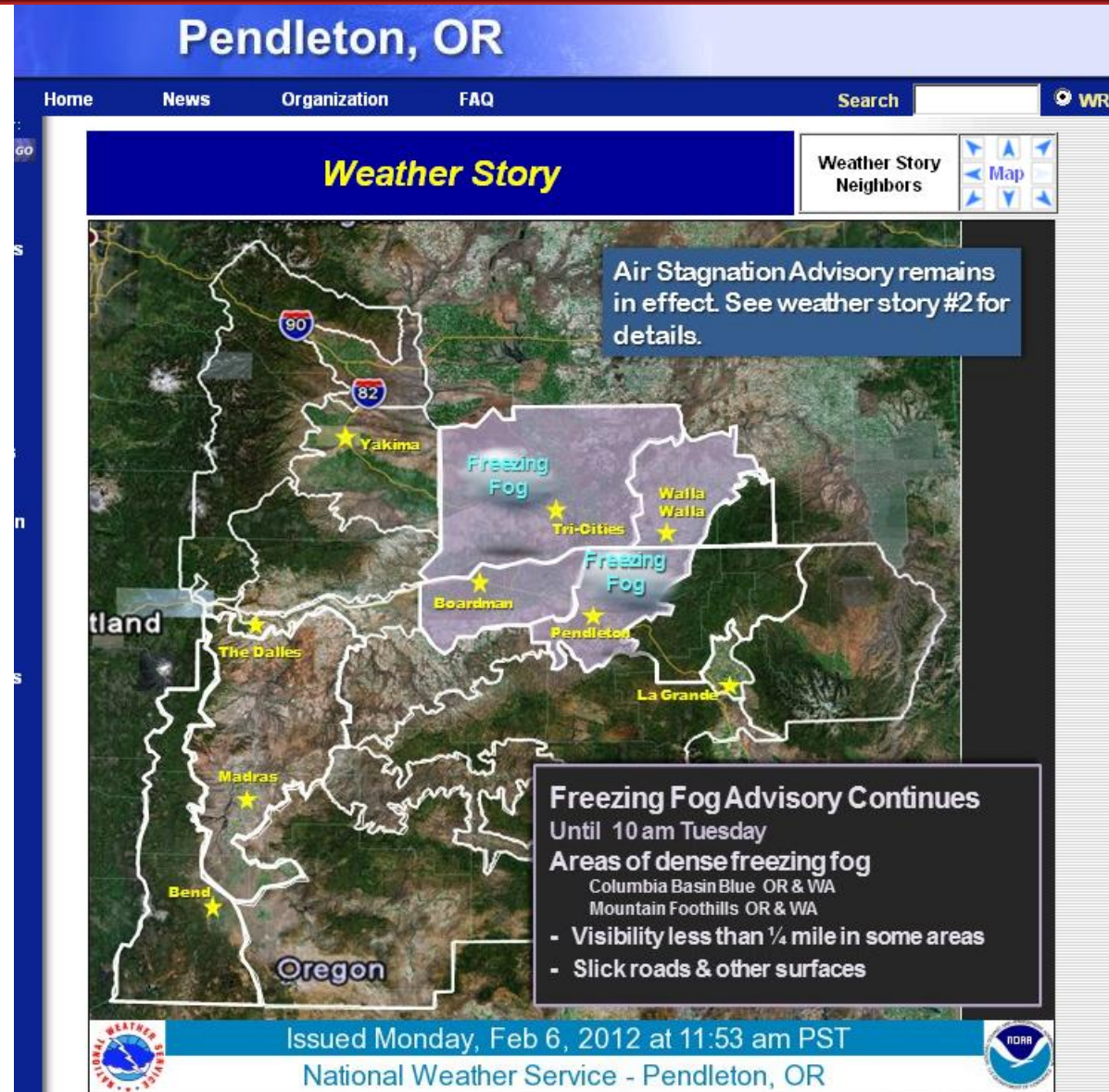


Furrow irrigation water without PAM

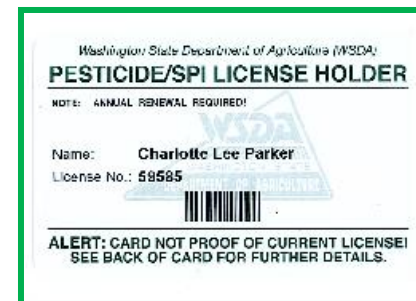
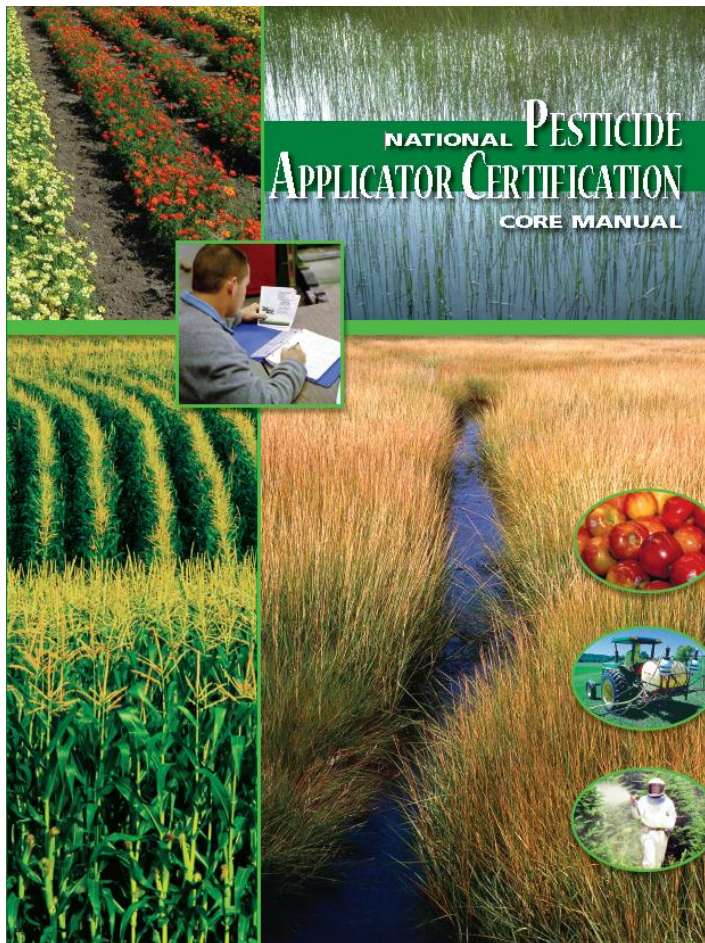


Furrow irrigation water with PAM

Always check the weather before making a pesticide application.



Pursue continuing education opportunities.



Using science-based best management practices will help protect our water resources.

