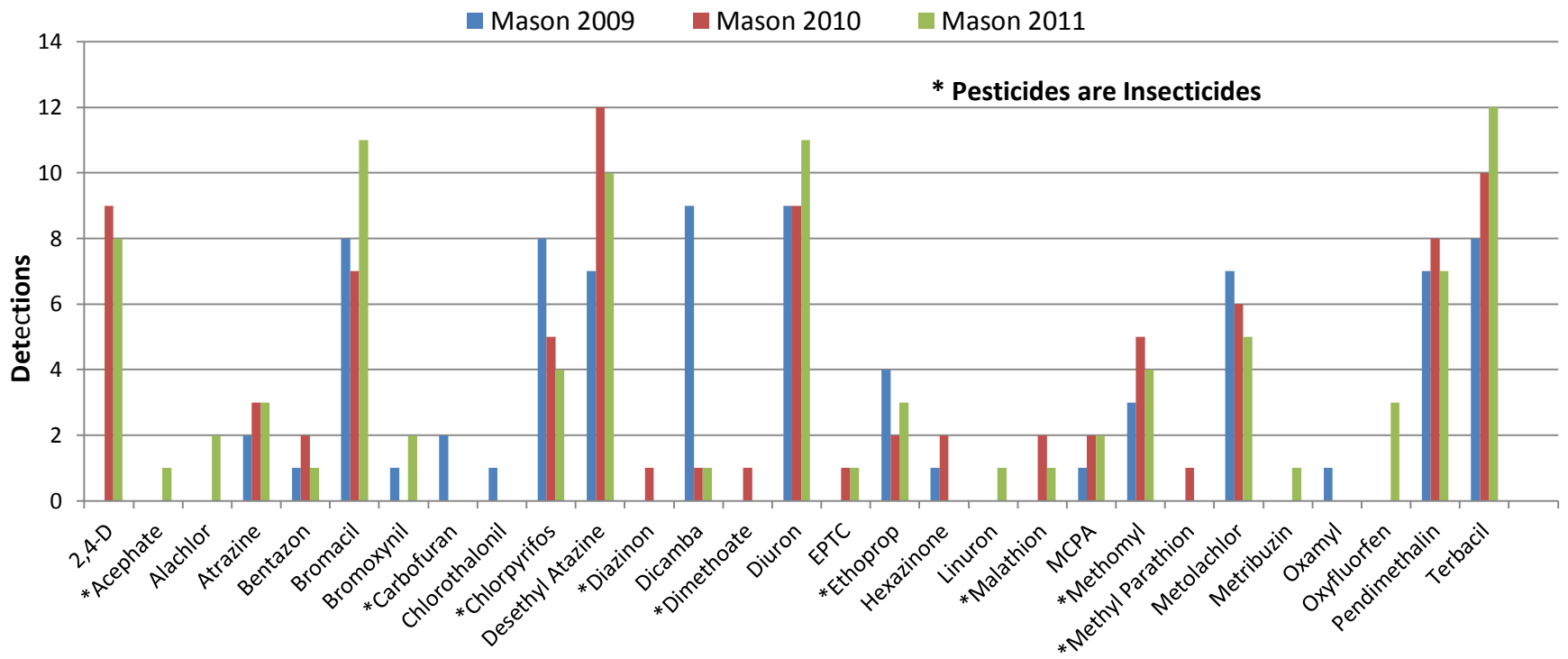
Protecting Water Quality with Agricultural Best Management Practices (BMPs)

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

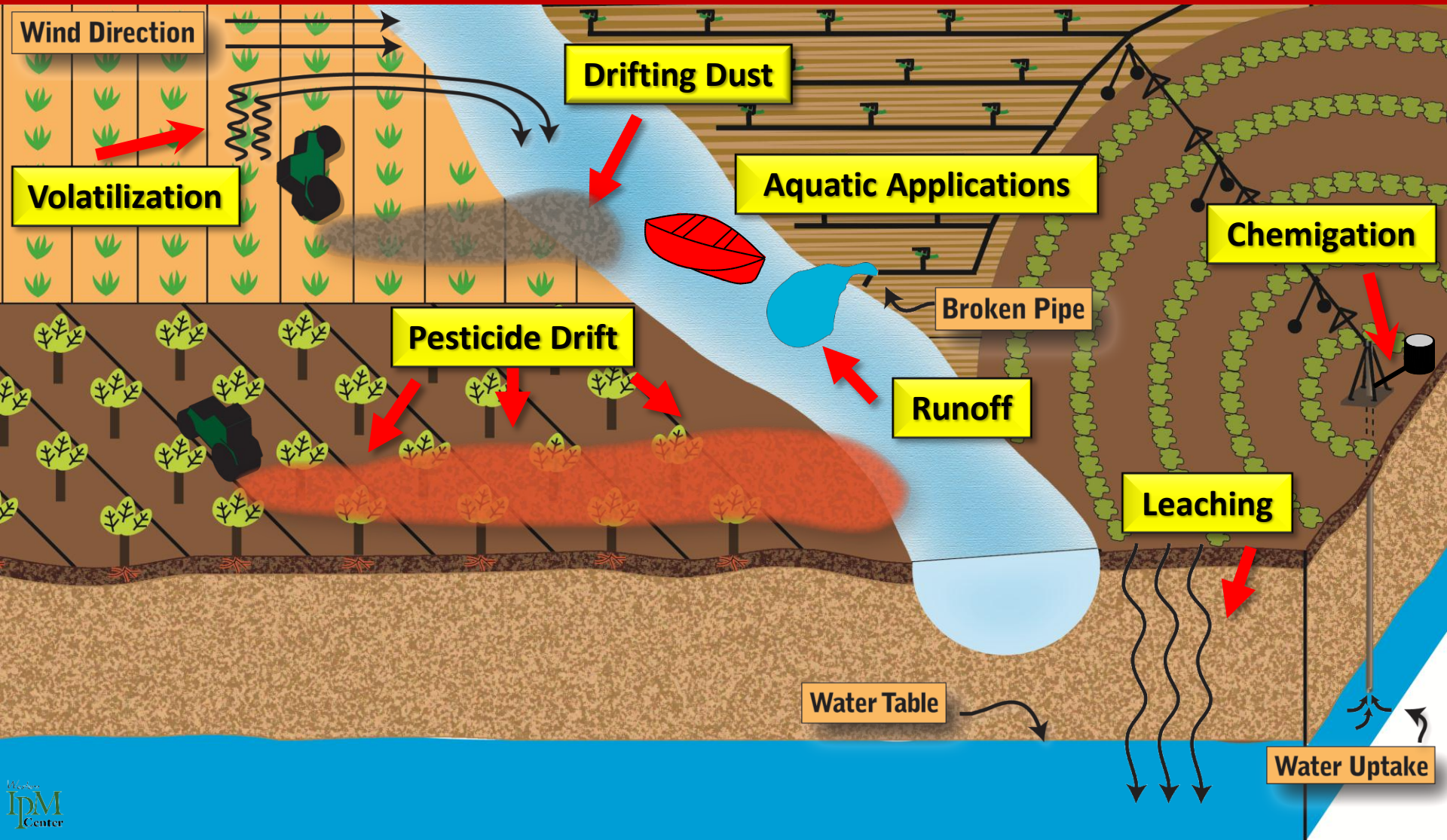
Pesticides Most Frequently Detected in Ada and Canyon County Ground Water
Atrazine, Atrazine Desethyl
Aldicarb Sulfone
Bentazon
Bromacil
Dacthal (DCPA)
Diuron
Metolachlor
Metribuzin
Simazine
Terbacil
Tebuthiuron
1,2,3-Trichloropropane

Agricultural pesticide use and good water quality can be compatible.

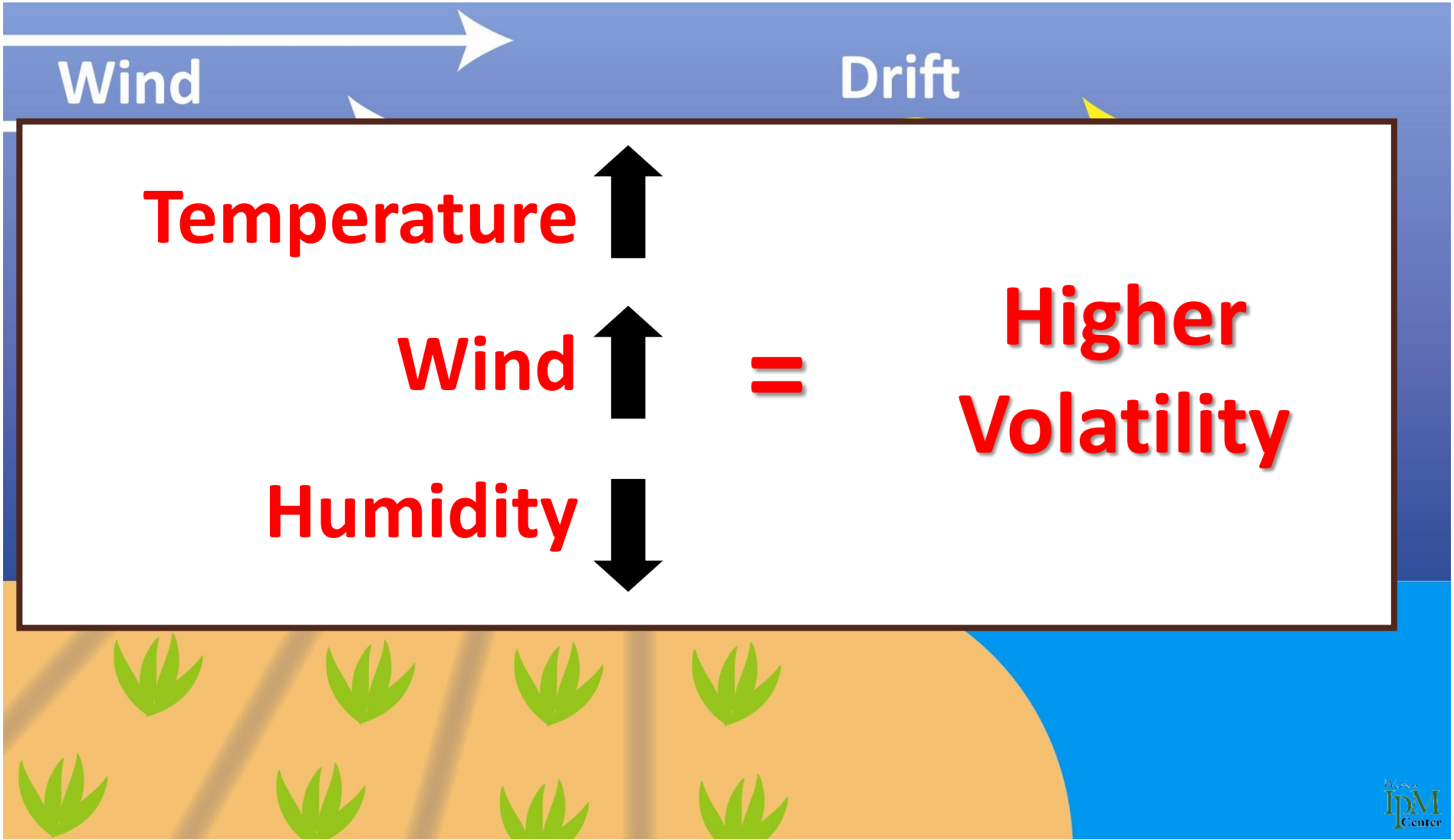

Photo courtesy of gmeador

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.

During pesticide applications, sprays can be carried into water.

Runoff and erosion can move pesticides off site.

Pesticides can leach into the water table.

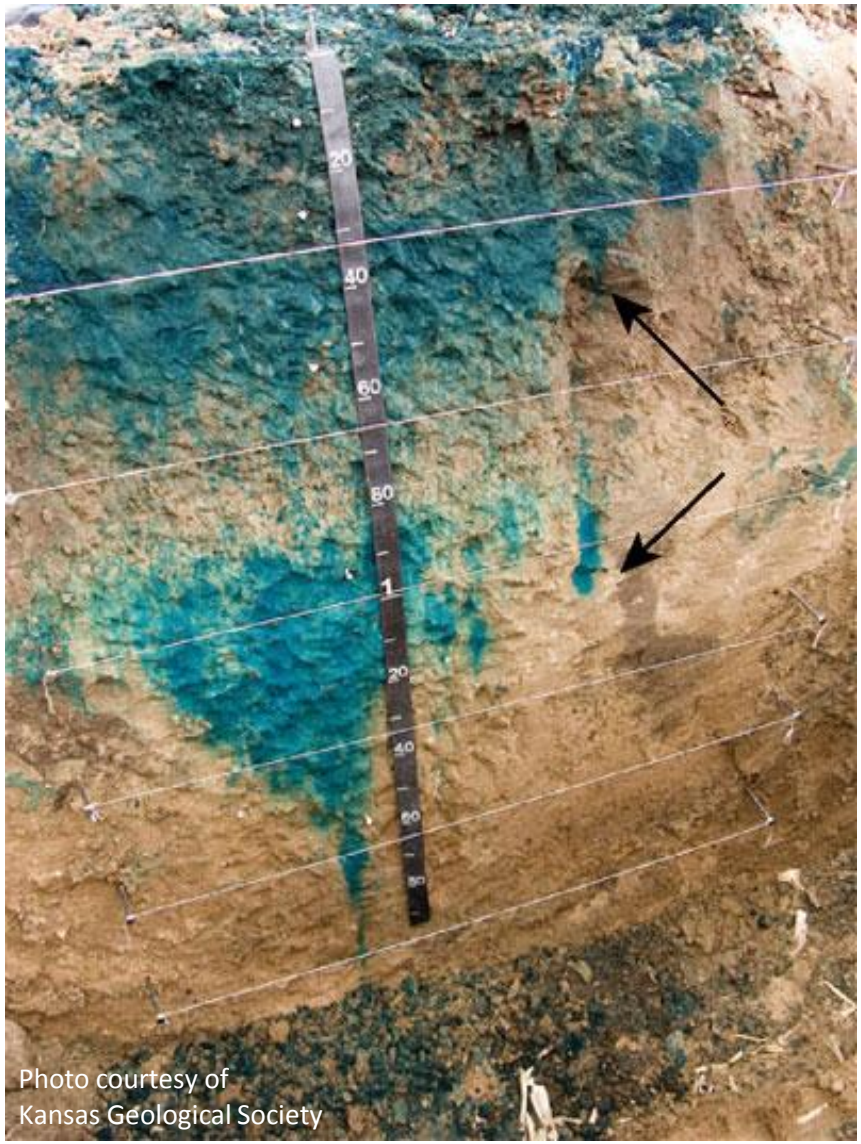


Photo courtesy of
Kansas Geological Society

Improper pesticide handling can contaminate water.

Pesticides sometimes get in water through intentional, direct application.

Weather conditions impact pesticide movement.

Excessive or untimely rainfall can affect pesticide movement.

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

Photo by tinle Yla, Flickr

Photo courtesy of nordique, Peter Stevens

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

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

Photo courtesy of USDA-NRCS

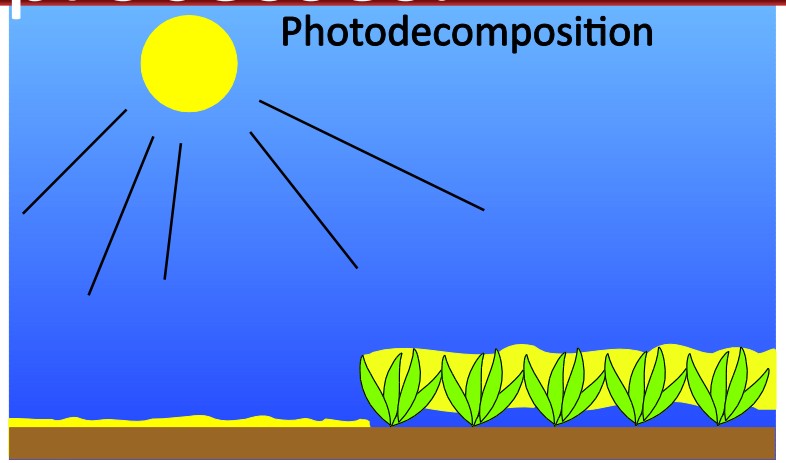
Soil organic matter and pH affect how tightly pesticides bind to soil.

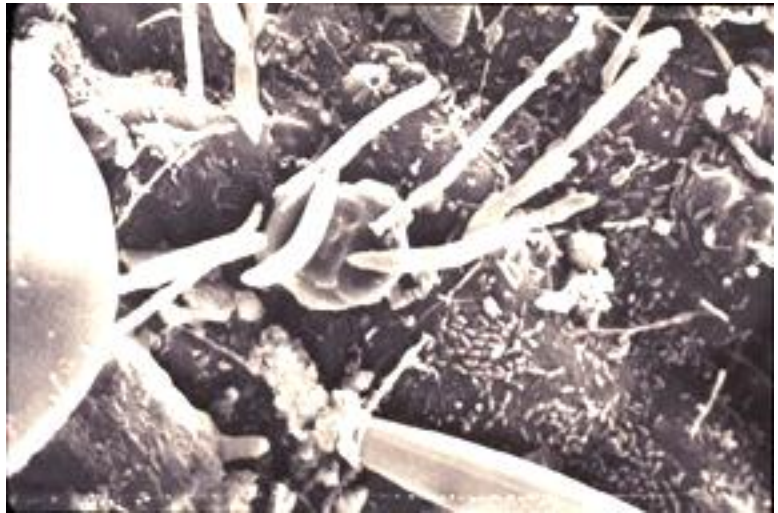
Deeper soil lessens the potential for pesticide leaching.

Photo courtesy of USDA-NRCS

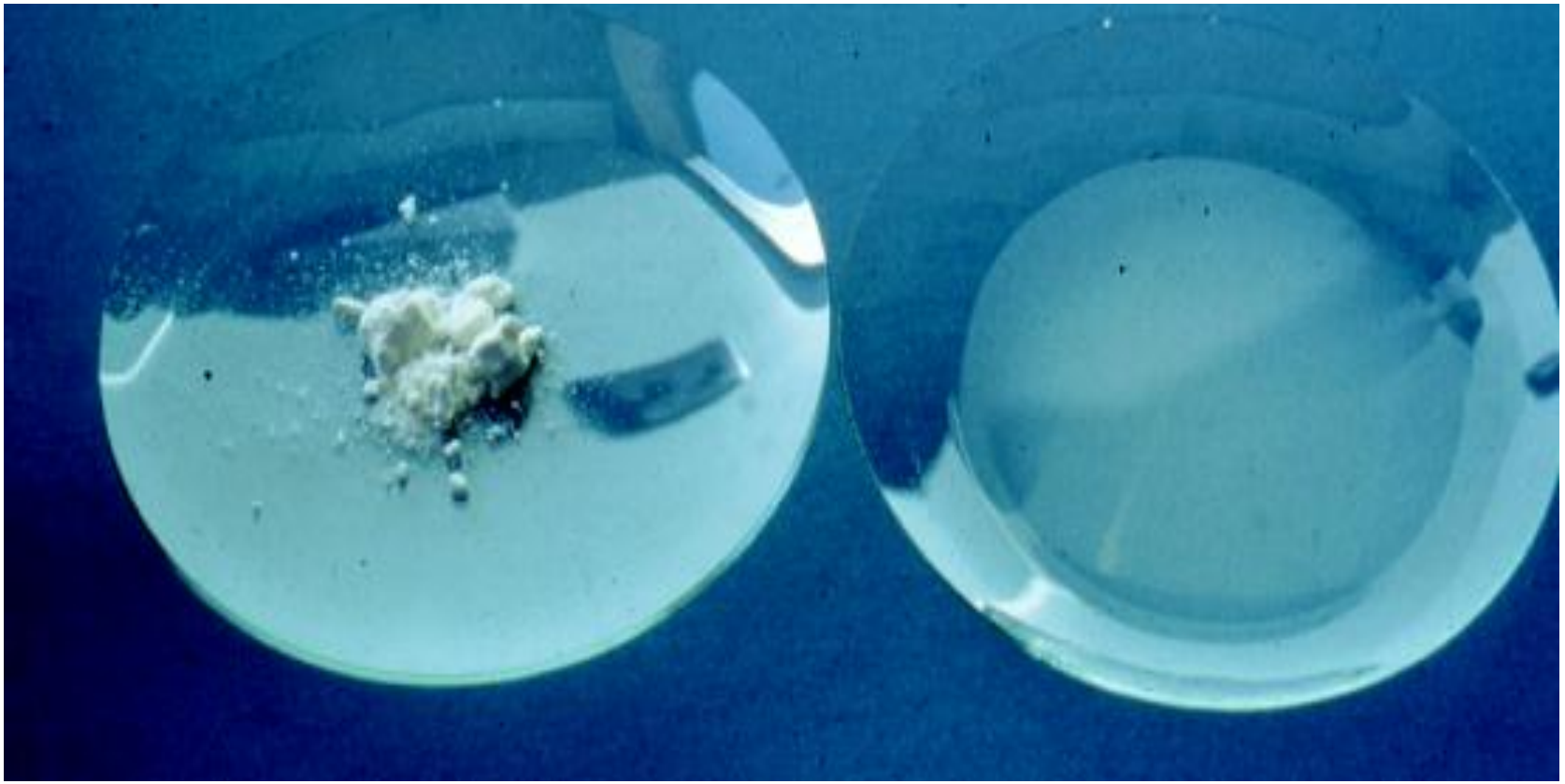
Pesticide Properties: Pesticides are degraded in the environment by microorganisms, sunlight, and chemical processes.

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.

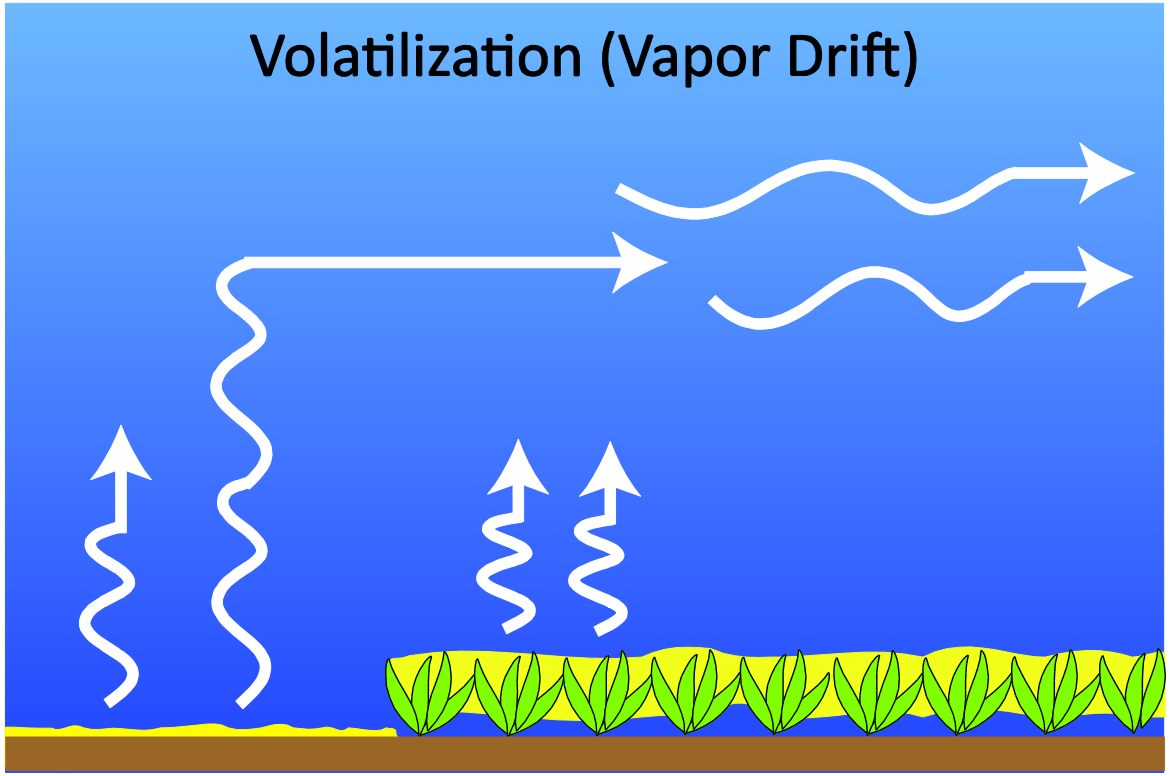



Photo courtesy of USDA-NRCS

Best Management Practices (BMPs) to Protect Water Quality

Western IPM Center

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.

From UCIPM Website

Protect beneficial organisms with proper timing of pesticide applications.

Rotate pesticides to avoid pesticide resistance.

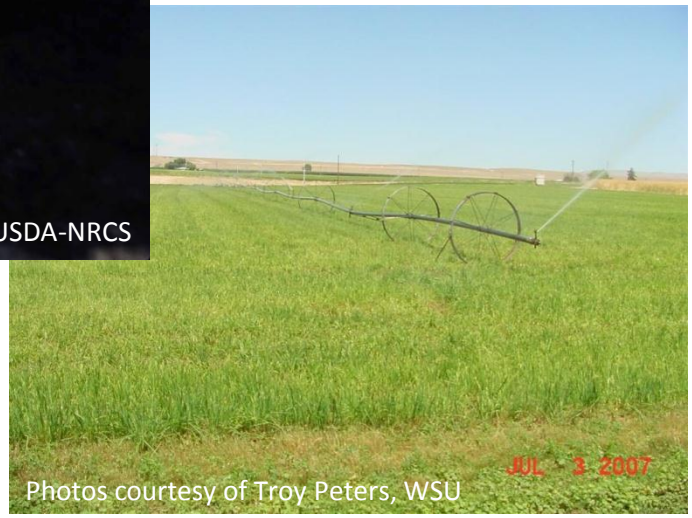
Use irrigation water management to reduce pesticides in water.

Photo courtesy of Troy Peters, WSU

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

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

Select the appropriate type of irrigation for your situation.



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

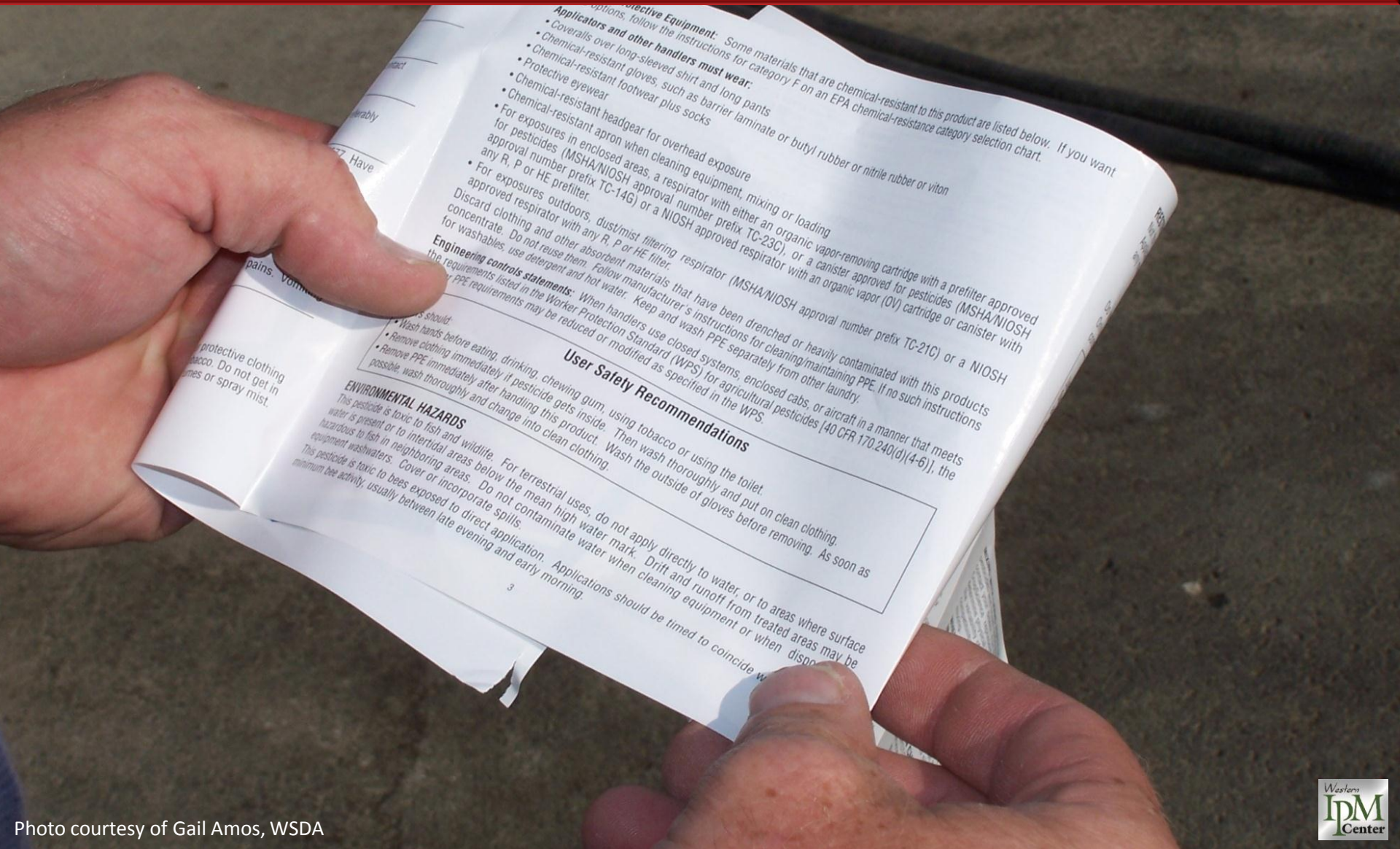


Photo courtesy of Gail Amos, WSDA

Do not apply pesticides near sensitive areas.

Always calibrate and maintain pesticide application equipment.

Photo courtesy of USDA-NRCS

Western IPM Center

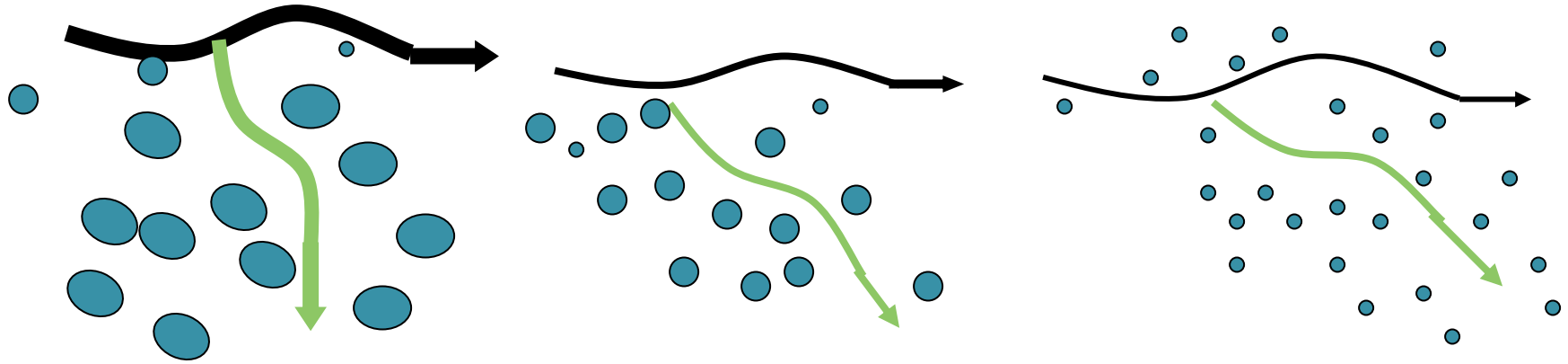
Regularly inspect pesticide equipment and keep it in good repair.

Photo courtesy of PNASH

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.

Photo courtesy of Gail Amos, WSDA

Always dispose of unwanted pesticides and empty containers properly.

Photo M. J. Weaver, Virginia Tech

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.

Photo courtesy of Gail Amos, WSDA

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.

Photo courtesy of USDA-NRCS

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

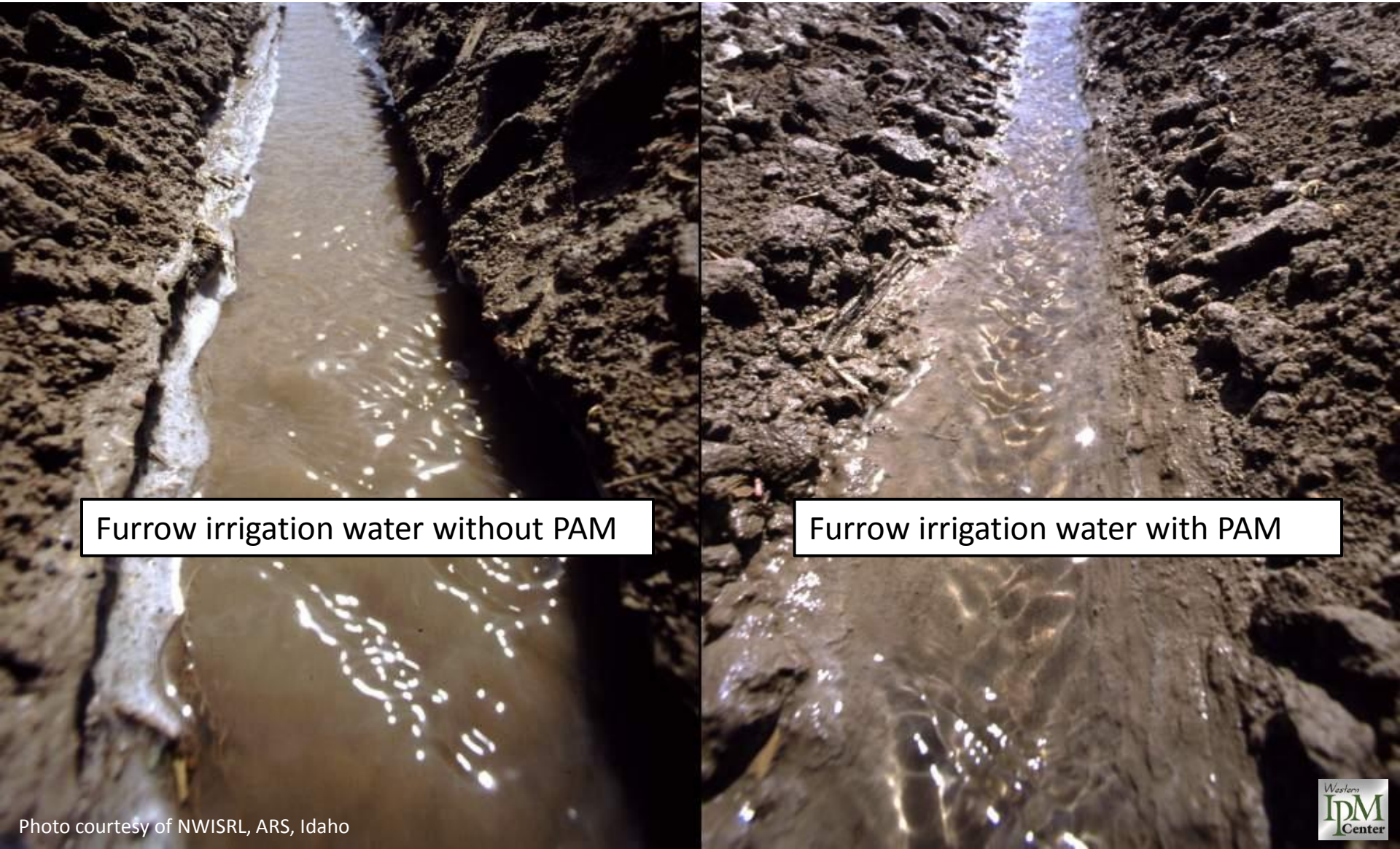
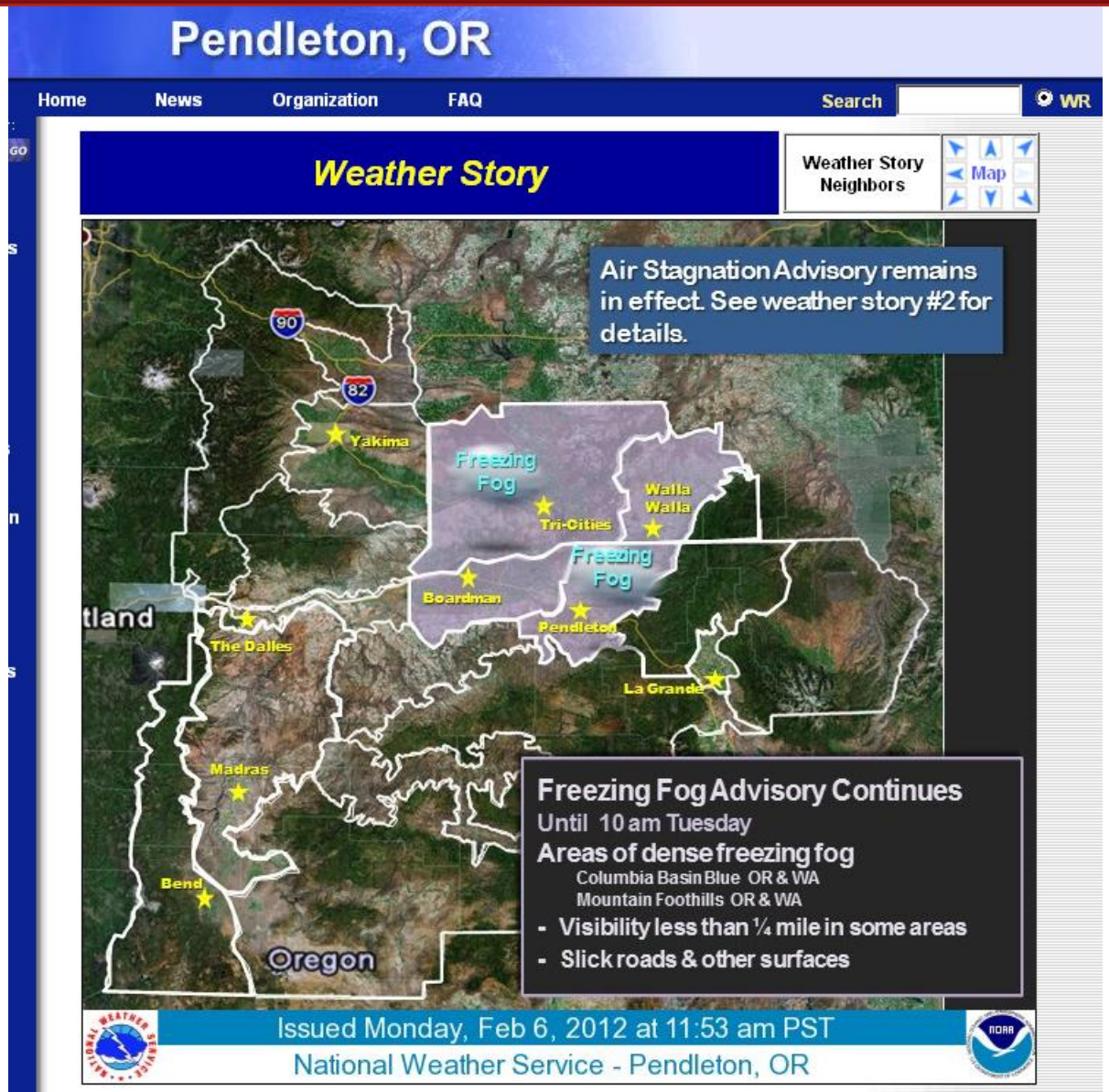
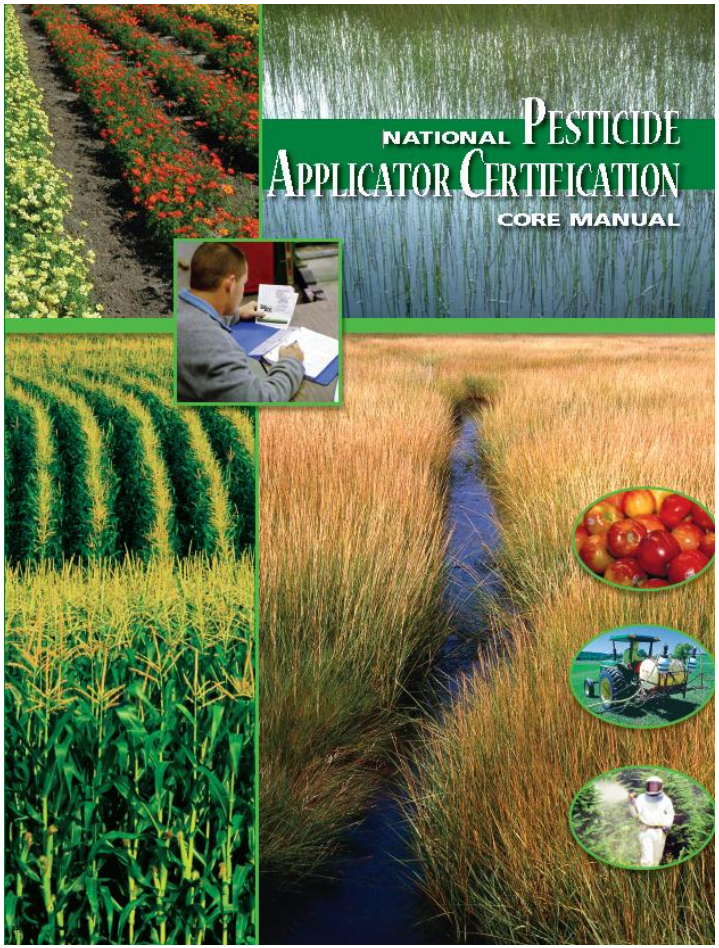


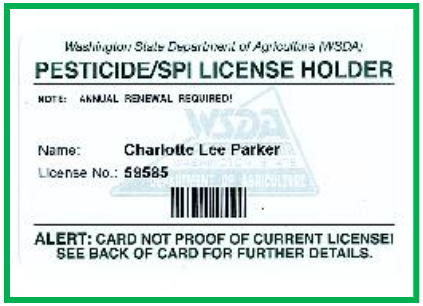
Photo courtesy of NWISRL, ARS, Idaho

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.

Photo courtesy of Joel Sartore, National Geographic