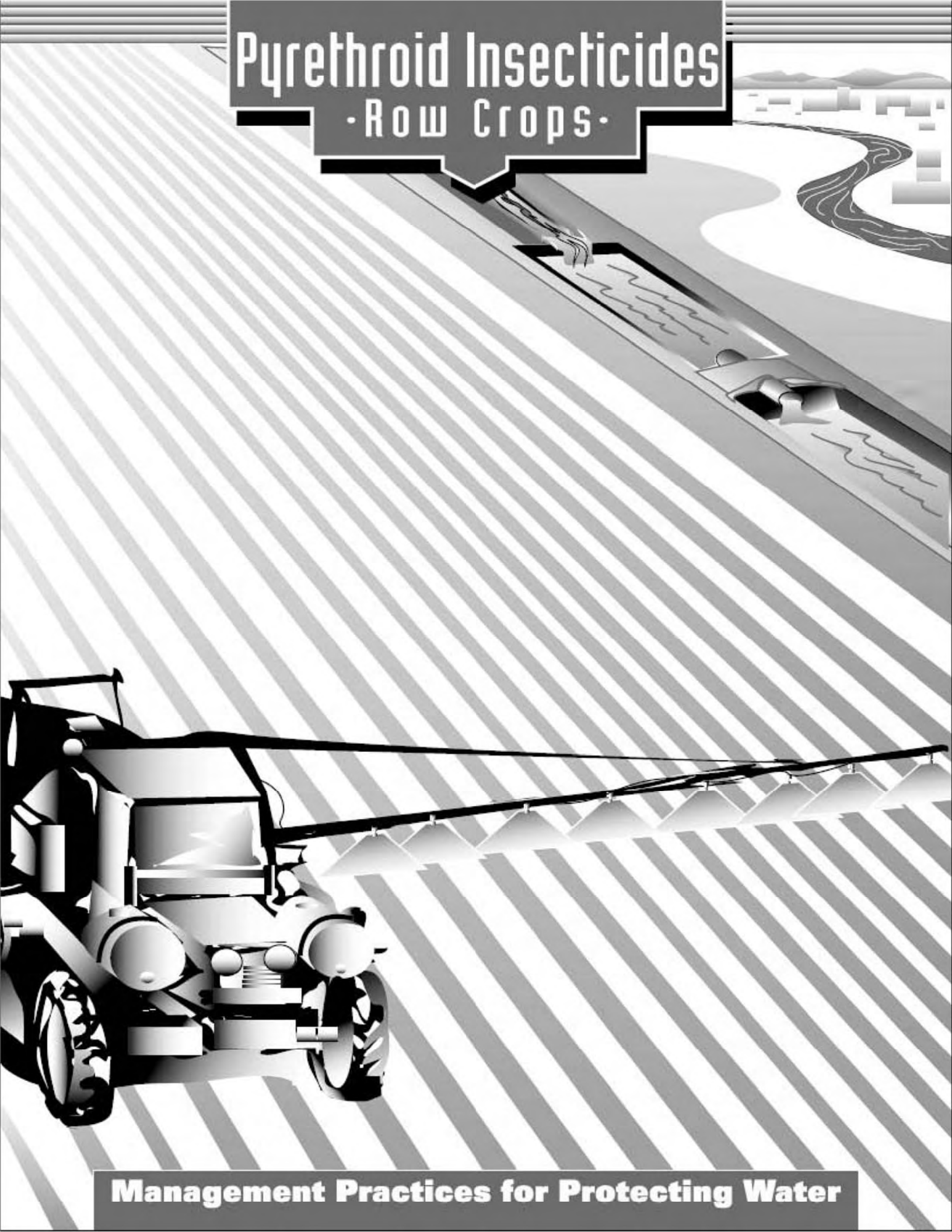
Pyrethroid Insecticides

·Row Crops·



Management Practices for Protecting Water

Pyrethroid Insecticides Row Crops

Stewardship Practices for Protecting Water

Whenever pyrethroid insecticide applications are made to row crops near waterways and other sensitive sites, growers and applicators should be aware of the potential for drift or runoff to these areas. Pyrethroid insecticides adhere strongly to soil particles and therefore have the potential to be carried off-site by sediment runoff in addition to moving dissolved in water. If pyrethroids move off site they could harm aquatic organisms so it's always important to minimize any off site movement. By taking a stewardship approach through the use of Best Management Practices (BMPs), the potential for drift or runoff can be minimized.

Stewardship practices are intended to reduce off-site movement to waterways and other sensitive sites. These practices along with product label directions can provide growers and applicators with the tools necessary to complete a successful spray application while avoiding off-site impacts.

Severe Consequences for Mistakes

Consequences for application mistakes or ignoring good practices can have wide reaching impacts throughout the agricultural community. Product uses could be dramatically restricted or cancelled, hindering growers' ability and flexibility to efficiently produce a profitable crop.

Each individual who handles or uses pesticides has the responsibility to take the proper precautions. Adhering to proper stewardship practices is good for both you and the entire agricultural community!

Evaluate Sensitive Sites

Evaluate the surrounding area to determine if waterways or other sensitive sites (schools, day-care centers, urban/commercial areas or endangered species) are in close proximity or are connected via ditches to the application area. Check if your fields are adjacent to endangered species habitat by visiting www.cdpr.ca.gov/docs/es/prescint.htm, the website for PRESCRIBE. Check with your County Agricultural Commissioner for local or state product-specific restrictions in your area.

Follow all Integrated Pest Management (IPM) practices prior to any pyrethroid insecticide application. Visit the University of California IPM website www.ipm.ucdavis.edu for information on IPM practices for your specific crop.

Pyrethroid Stewardship Recommendations

This publication outlines stewardship practice recommendations useful during the handling and application of pyrethroid insecticides. **These recommendations are based on language from product labels and other expert resources.** They are intended as guidance on good stewardship measures useful for both ground and aerial applications, especially near sensitive sites (see more details on these and other practices on following pages). Stewardship practices recommended for California conditions include:

1 The applicator must be familiar with the product label including restrictions that reduce the potential for runoff or drift to sensitive areas.

2 Do not apply by ground within 25 feet or by air within 150 feet of lakes, reservoirs, rivers, permanent streams, marshes, pot holes or natural ponds, estuaries and commercial fish ponds. Increase the buffer zone to 450 feet when using ultra-low volume (ULV) applications.

3 Adopt irrigation runoff practices to minimize or eliminate off-site movement of sediments which may contain pyrethroid residues.

4 Avoid applications just prior to a rainfall event or irrigation to minimize the potential for runoff. Check weather forecasts for upcoming rain events at: www.fieldwise.com or www.foxweather.com.

5 Risk of exposure to aquatic and sensitive areas can be reduced by avoiding applications when wind is blowing toward the sensitive area.

6 Avoid aerial spraying. If no other application options are available, spray by air **only** when wind speed is between **3 and 10 mph.**

7 Avoid ground applications when wind speed is greater than 10 mph.

8 Use a registered, effective drift control agent and/or proven drift reducing application equipment. Check the pyrethroid label and with your farm input supplier's representative for the appropriate drift control agent. Be aware that the mix water pH levels can influence the effectiveness of pesticides and drift control agents.

9 Choose the lowest chemical rate that provides efficacy when applied through your equipment. However, be aware of the potential impact that lower rates could have on control of pests and resistance management programs.

10 Always shut off nozzles when making row turns.

11 Shut off boom over irrigation ditches, washes, culverts and other waterways.

12 When spraying partial swaths, shut off individual nozzles that are not aimed at the target crop.

13 Attend annual pesticide training for growers and/or applicators. Check with your local agricultural commissioner or farm advisor for dates.

14 Make sure applicator always has any required county permit(s) and MSDS on hand during treatments.

15 Adopt on-site practices to reduce runoff (see following section).

See your county guidelines for product-specific restrictions and recommendations

On-site Practices

On-site practices are approaches for managing soil, water, pesticides and nutrients for sustainable agricultural production that minimize environmental impacts.

The goal is to:

- Reduce or eliminate sediment movement from the field.
- Reduce or eliminate flows of runoff water carrying dissolved pesticides and nutrients.

These practices include but are not limited to:

1 **Managing irrigation tailwater and occasional rainfall runoff to minimize or eliminate the impact of off-site movement of sediment using:**

- Tailwater return systems to recirculate tailwater and reapply to other parts of the field.
- Sediment basins or holding ponds that retain runoff for a period of time to allow sediment to settle out.
- Use of PAM (polymer compound) to reduce the transport of sediment in the irrigation water. Benefits of PAM include:
    - Reduction in runoff volume through increased water infiltration.
    - Reduction in pesticide mass carried by sediment.
    - Reduction in erosion of furrows.

2 **Improved irrigation practices:**

- Monitor soil moisture so that levels are not too high when irrigations occur, allowing for increased infiltration and less tailwater runoff.
- Use sprinklers or drip irrigation to reduce the amount of tailwater runoff.

3 **Use vegetated ditches at field ends to enhance reduction of residues in tailwaters and to slow flow. Benefits include:**

- Faster breakdown of pesticides on vegetation than soil.
- Slows water movement and reduces sediment carried in surface flows.
- Adsorption of pesticides to plant surfaces.

4 **Time spray application to allow at least 48 hours between application and irrigations.**

5 **Maintain field sanitation to reduce pest buildup.**

- Disk fields immediately after harvest to avoid pest buildup on harvested plants and migration to other crops.

Note: Pyrethroid product labels specifically require that users do not cultivate within 10 feet of an aquatic area so as to allow growth of a vegetative filter strip.

Sprayer Set Up

1 Know the droplet spectrum of each nozzle (available from nozzle distributors).

2 Use nozzles with volume median diameter (VMD) appropriate to the insecticide being applied (check with County Agricultural Commissioner for local requirements).

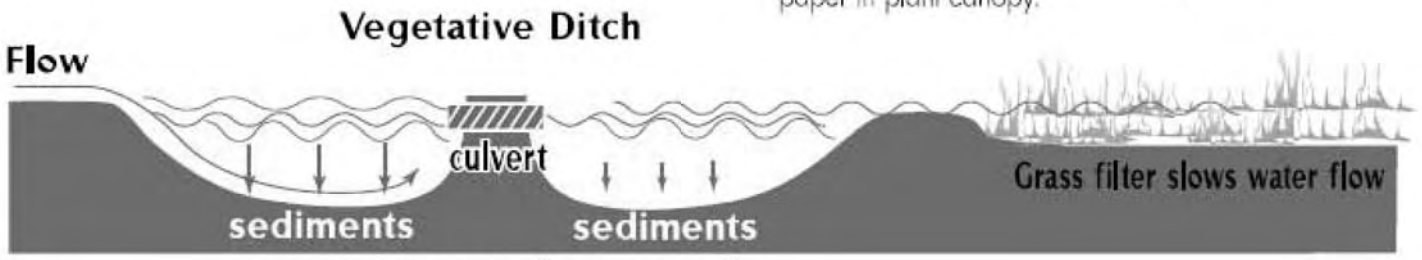
3 Replace worn nozzles when necessary with newer, more effective drift reduction nozzles (at least once per season). Note nozzle sizes for future reference.

4 Use nozzles that provide adequate coverage at the largest possible droplet size and the recommended droplet size spectrum to reduce drift while maintaining efficacy. Formation of very small droplets (which drift more) can be minimized by appropriate nozzle selection, by orienting nozzle away from the air stream as much as possible and by avoiding excessive spray boom pressure.

5 Consider spray controllers that adjust nozzle output based on ground speed. Be sure to understand the limitations of the controller and select the proper nozzles for use with the speed range you expect. Do not allow the pressure to get too low as to cause streaking or too high as to cause excessive fine droplets.

6 Use the lowest boom height that provides uniform coverage.

7 Check sprayer coverage by placing water-sensitive paper in plant canopy.



Evaluate Each Field Site

Evaluate each field to pinpoint areas that are erodible where sediment might move offsite to waterways. Also, identify points where surface water runs off onto waterways or other sensitive areas. Get help with identifying these sites through local Natural Resource Conservation Service (NRCS) offices.

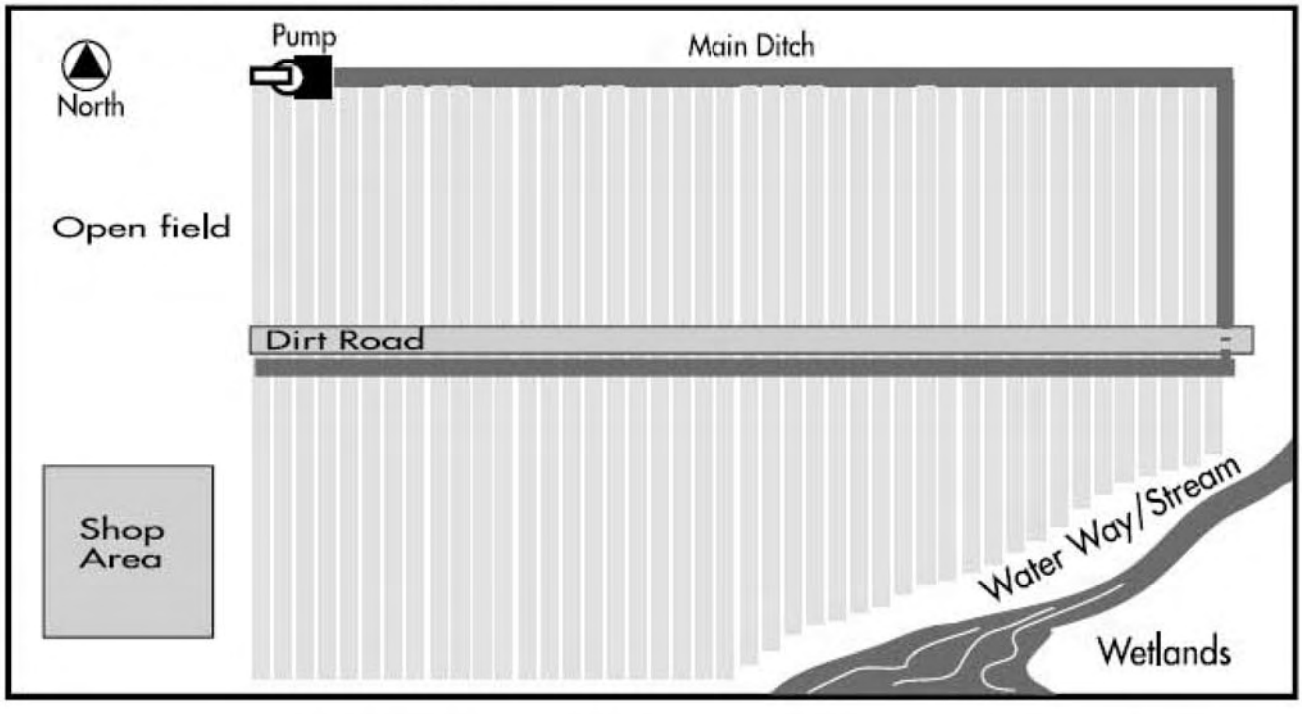
1. Sketch your field and note location of: wells, sinkholes, highly erodible land, drainage ditches, streams and rivers.
2. Flag or stake no treatment buffer zones.
3. Provide the sketch to all sprayer operators, commercial applicators, Pest Control Advisors or anyone involved with pest management decisions.

Grower Responsibilities with Aerial Applicators

When hiring a commercial aerial applicator to apply a pyrethroid insecticide, the grower is responsible for ensuring that the following steps are followed:

1. Positively identify and confirm the targeted pest(s) before ordering the application.
2. Make sure the product is labeled for the targeted pest(s) and follow all spray drift precautions on the product label.
3. Hire only licensed, responsible, reputable applicators.
4. Confirm that the aerial applicator has a written recommendation from a licensed Pest Control Advisor (PCA).
5. Positively identify the proper site for application. Use GPS coordinates if applicator has this capability. Provide the applicator with a sketch of your field.
6. Check to ensure weather conditions are appropriate for aerial applications by reviewing the 1-6 hour forecast prior to initiating treatments.
7. Don't pressure applicators to make treatments when conditions are marginal. This is illegal and can jeopardize their licenses as well as the industry standard for stewardship.
8. Make sure aerial treatments are applied properly, avoiding direct overspray or off-site movement toward waterways and other sensitive sites.
9. The spray boom should be mounted on the aircraft so as to minimize drift caused by wing tip vortices. The minimum practical boom length should be used and must not exceed 75% of the wing span or rotor diameter.
10. Spray should be released at the lowest possible height consistent with pest control and flight safety. Applications more than 10 feet above the crop canopy should be avoided.

Field Layout Map Example



Properly Calibrate Sprayer

1. Calibrate equipment prior to each application. Note results for future calibrations.

2. Determine the three parameters needed for a complete calibration.

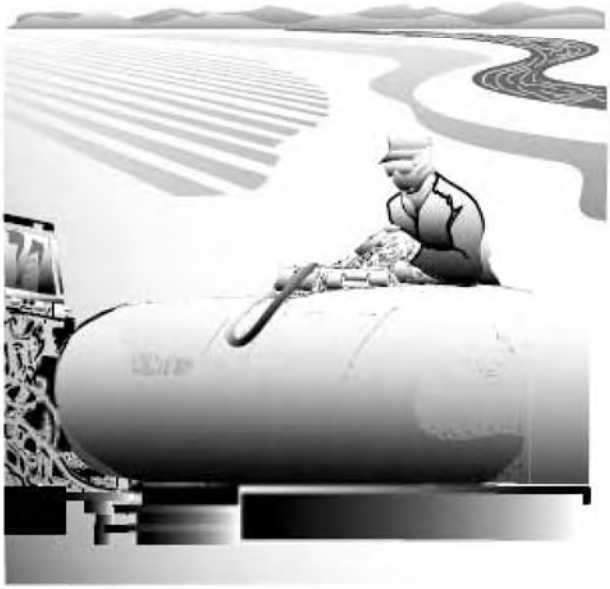
    - Travel speed
    - Output rate
    - Desired volume

Carefully Select Mixing and Loading Site

1. If possible, use a concrete or asphalt pad that drains to a central sump. Otherwise, vary the location of mixing and loading site to prevent accumulation of accidentally spilled spray materials.

2. Take precautions to ensure there is at least 100 feet between a mixing/loading area and any wells or ditches, canals or streams that feed into nearby rivers.

3. Mix and load on a site not prone to runoff and where soil can be disked after mixing/loading is completed. Do not mix or load on hard-packed roads that could drain or run off into nearby areas or waterways.



Follow Proper Mixing and Loading Practices

1. Do not leave sprayer unattended while filling.

2. Partially fill tank (usually 1/3 to 1/2 full of water) prior to the addition of chemicals (check label to see if order of adding products is required).

3. Make sure that the sprayer has sufficient agitation (mechanical or bypass) to keep chemical mixed. With bypass agitation, be sure to check if agitation will be sufficient when sprayer is actually spraying.

4. Make sure sprayer agitation system is running while mixing and loading pesticides.

5. Do not overfill tank. Spills can wash away to sensitive areas. Use air gap to prevent tank overfilling.

6. Use backflow valve on the fill tube.

7. Use a closed chemical transfer system whenever possible.

8. Open paper chemical packages with scissors or knife, rather than tearing.

9. Immediately triple rinse containers. Pour rinsate into tank prior to filling.

10. For returnable bulk containers, check with supplier for rinsing instructions.

11. Apply rinse water back to treated field. Never just drain out especially near well heads, water sources, etc.

12. Check with county for proper disposal methods for empty pesticide containers.

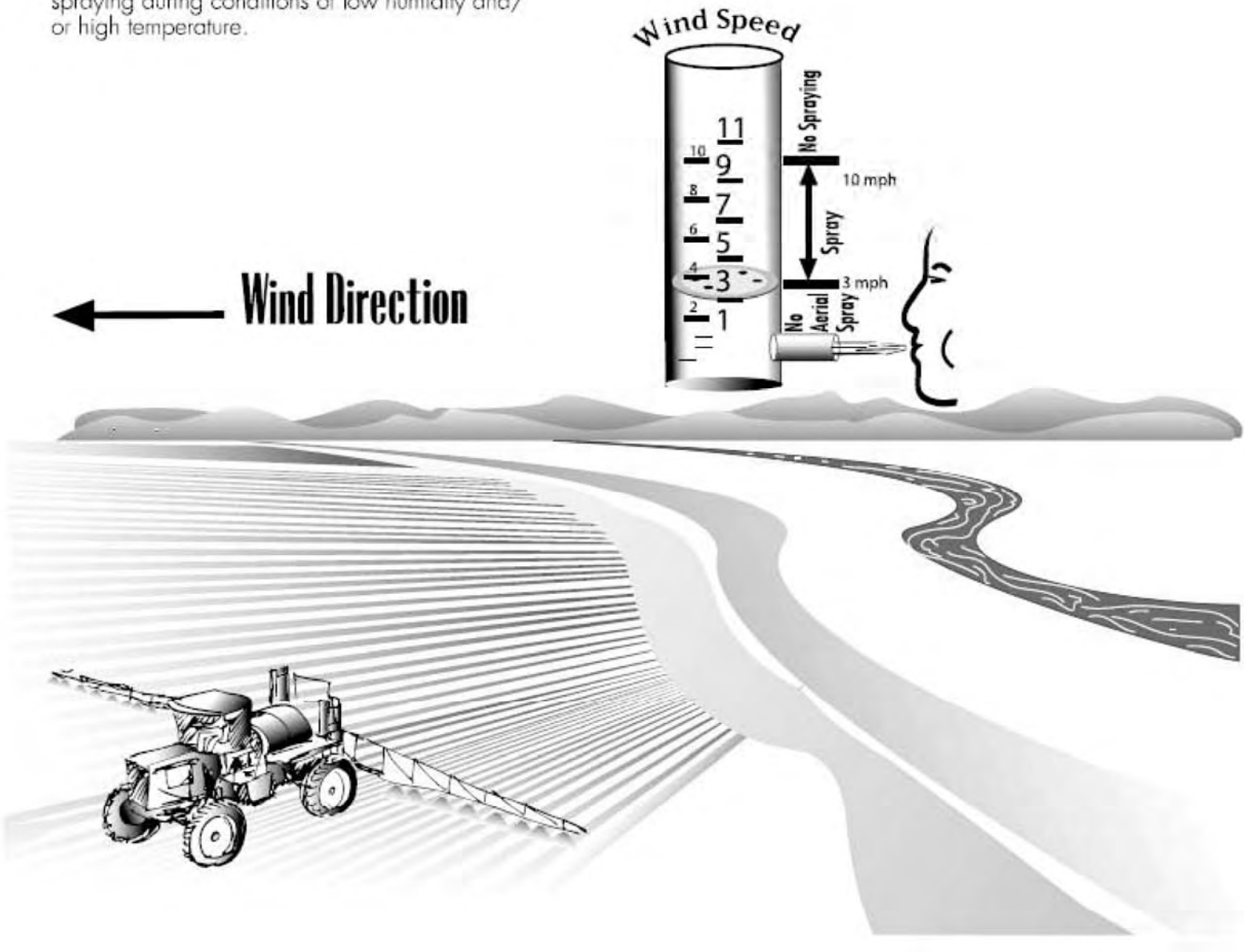
Monitor Weather Conditions

1. Always monitor weather conditions prior to, during and after an application.
2. Check with the County Agricultural Commissioner about application restrictions in adverse or questionable weather conditions.
3. Do not make aerial or ground applications during temperature inversions which are characterized by stable air and increasing temperature with height above the ground.
4. If other approaches have not provided sufficient information concerning weather conditions, create a smoke column to determine wind direction and the presence or absence of an inversion layer (check with the County Agricultural Commissioner for agricultural burning restrictions).
5. Low humidity and high temperatures increase the evaporation rate of spray droplets and the likelihood of increased spray drift to aquatic areas. Avoid spraying during conditions of low humidity and/or high temperature.

Record Application Conditions

Should a pyrethroid application result in a complaint, the best way to resolve the conflict is with accurate and complete records of the application conditions. Recording a few simple facts could prove valuable in the event of an incident or complaint.

1. Compile and maintain a summary report on weather conditions prior to, during and after the application. Also note changes in conditions when stopping to refill or adjust equipment.
2. Consider using a proven and accurate hand-held wind speed and temperature indicator to record on-site field conditions. Be sure to note wind direction.
3. Local weather services, Internet services (government and private providers) and weather stations at local airports can be sources of current and forecasted weather information.
4. Prepare a field site sketch with sensitive areas and precautions taken.



Consider Integrated Pest Management (IPM) Approaches

The University of California Cooperative Extension has developed IPM guide books for a number of row crops that detail numerous pest management options. Commodity organizations and farm-input suppliers also can provide information on IPM. Basic principles of an IPM approach include:

1. Thoroughly scouting a field to monitor and assess the pest situation. Document scouting practices and keep good records, whether you spray or not.
2. Consider all reasonable options to mitigate a pest problem when making decisions concerning pest management.
3. Rotate applications of chemical classes to avoid pest resistance.
4. Stay informed about new practices and materials for use in an IPM program.

Developed with support from:

Bayer CropScience

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Coalition for Urban/Rural Environmental Stewardship

www.curesworks.org

Application Equipment **Checklist**

Before filling the tank, adding pesticides and beginning an application, closely perform a visual inspection of the equipment. Always wear personal protective equipment when checking application machinery.

Check and Make Sure:

- ☐ Hose connections are sealed and tightened.
- ☐ Regulator connections are sealed and tightened.
- ☐ Sight gauges are clear and working.
- ☐ Clean filters and screens on a daily basis.
- ☐ Fix leaking gaskets immediately.
- ☐ Pressure gauges are located at the proper points with proper scales and are sealed and working.
- ☐ All nozzles and metering devices are of correct size, sealed and unobstructed.
- ☐ All sprayer shields are in place (where appropriate).
- ☐ Tank drain plug is in place.
- ☐ There is no damage to hoses or piping.
- ☐ Never leave pesticides in a sprayer overnight.

Stewardship of Lorsban-4E/Lock-On Insecticides (Chlorpyrifos) to Avoid Water Quality Issues

Chlorpyrifos Residues Detected in Local Waterways

Water testing conducted in recent months by Central Valley water quality coalitions has detected residues of chlorpyrifos – the active ingredient in Lorsban®-4E and Lock-On® insecticides – in several waterways where farm runoff is common.

Dow AgroSciences
Lorsban®-4E
Insecticide

Dow AgroSciences
Lock-On®
Insecticide

Q A How has this happened?

Residues of chlorpyrifos have been entering surface water through three potential routes following treatment of alfalfa (as well as other field and tree crops):

- Irrigation tail water runoff
- Spray drift into waterways that border fields
- Storm water runoff after fields have been treated with an insecticide

Q A What does this mean to alfalfa growers and/or PCAs?

Lorsban-4E and Lock-On provide effective and economical control of key alfalfa pests such as weevils, aphids, armyworms, cutworms, leafhoppers and plant bugs.

Detections of chlorpyrifos residues may result in serious regulatory restrictions. The restrictions could threaten the future use of an important insect management tool in alfalfa and other crops in certain areas of California.

Q A What has Dow AgroSciences done?

New label changes have been implemented for Lorsban-4E and Lock-On in alfalfa:

- A restriction statement: "To avoid contamination of irrigation tail waters, do not flood irrigate within 24 hours following a soil surface or foliar application."
- Addition of spray drift management guidelines. See labels for more details.
- Addition of buffer zones when chlorpyrifos applications are made adjacent to permanent bodies of water or other sensitive aquatic areas (25 feet for ground applications and 150 feet for aerial applications). See labels for more details.
- Reduction in the total number of chlorpyrifos applications allowed per season.
- Re-treatment interval of 10 days for all products containing chlorpyrifos.

It's Not Just Chlorpyrifos

While water testing has indicated the presence of chlorpyrifos, be aware that ANY pesticide used on crops could potentially be transported into waterways through these routes and detected in monitoring. If preventative actions are not taken, ANY pesticide or nutrient could potentially reach waterways, thus threatening future use of those important farm inputs.

Call to Action

Dow AgroSciences is committed to the long-term defense and stewardship of chlorpyrifos products; however, Dow AgroSciences cannot do it alone. Growers and PCAs also need to take immediate action to preserve the use of this important insect management tool. Simply switching insect control products is not a long-term or short-term solution, as waterways will continue being monitored for many farm inputs.

Best Management Practices (BMPs)

The following BMPs can be implemented to help protect farms and valuable farm inputs.

Field Site BMPs

- Vegetative ditches, barriers, filter strips around field perimeters to reduce sediment movement, increase filtration of sediments, and reduce overall volume of runoff water.
- Holding ponds (sediment basins) to capture runoff water and settle out sediments.
- Tail water return systems for reuse of excess irrigation water.
- Irrigation management to reduce the amount of runoff at the end of each field.

Spray Drift Management & Other Application BMPs

- Be aware of sensitive sites and waterways that are near the field being sprayed.
- Avoid spraying directly into or toward a ditch carrying water out of the field.
- Know the current weather conditions (rain, wind speed and direction) and avoid making an application if conditions favor off-site movement of the pesticide.
- Be aware of the weather forecast and consider its impact to an application.
- Use drift control agents and/or drift-reducing application equipment.

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For additional information, contact a County Ag Commissioner or the Coalition for Urban/Rural Environmental Stewardship (www.curesworks.org).

Dow AgroSciences™

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Watershed Coalition News

INFORMATION FOR CENTRAL VALLEY AGRICULTURE

WINTER/SPRING 2008

SOUTH VALLEY

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Joining Coalitions Gets Easier

It's now easier for growers not yet in a Central Valley watershed coaliton to join their local organization – although it's going to cost more soon. The Regional Water Board approved at its April 24 meeting a change in the Irrigated Lands Regulatory Program (ILRP) that gives its Executive Officer broader discretion in allowing growers to join a watershed coalition formed to be in compliance with the regulation. In the past, potential dischargers who applied after the December 31, 2006 deadline were required to file for an Individual Discharger Conditional Waiver or for Waste Discharge Requirements except under circumstances such as purchasing land or adding irrigation.

While joining may now be easier, a State fee may be charged to new applicants after June 30, 2008. A $200 fee (or possibly more) will be assessed for each application to pay for Regional Water Board staff time for processing the paperwork. The fee itself and the amount to be charged await approval by the State Water Resources Control Board which may not come until September 2008. If okayed, the fee is expected to be retroactive to June 30. The two-month delay adopting the fee is intended to encourage out-of-compliance landowners to join coalitions before the fee kicks in.

In most regions of the Central Valley, new applicants can expect to pay back dues charged by individual coalitions. In the East San Joaquin Water Quality Coalition, new members must pay back dues from 2004-2007 if the land was in production and irrigated during the period. Most Sacramento Valley subwatershed groups and the Delta coalition have similar policies.

At the April board meeting where the change in language was proposed, Regional Water Board staff emphasized that the Executive Officer would likely approve the application of any grower who is willing to work with a watershed coalition and comply with ILRP requirements. Recalcitrant dischargers and those not working cooperatively with coalition groups will not be allowed to join and would be regulated under the Individual Discharger Conditional Waiver or receive Waste Discharge Requirements, they said.

Input Sought on Long Term Irrigated Lands Program

Just as Central Valley agriculture is getting used to the Irrigated Lands Regulatory Program (ILRP), it's time to change it. The current program, labeled "interim" by State regulators, is set to expire in 2011. In its place will be the "Long Term Program" which is currently being drafted by the Regional Water Board with input from stakeholders who submit written comments to the Board or attended three public hearings in April.

While much of the new program could end up looking similar to the existing ILRP, one thing is almost certain: groundwater, in some way, shape or form, will be part of the new ILRP. Groundwater was identified as lacking adequate protections in early versions of an Environmental Impact Report now being written on the program. At a joint meeting of the State and Regional Water Boards in August 2007, members from both Boards directed staff to begin planning how to include groundwater in the long term program.

In briefing documents released before the public hearings, the Regional Water Board outlined what it considers to be key issues for a long term program. Managed wetlands and greenhouse operations with permeable floors may be removed from the irrigated agriculture category. The board also asked for input on creating a groundwater program and "alternate approaches for achieving program goals" in its existing surface water program. This might include grouping similar agricultural operations under regulatory requirements based on geography, commodity, operation or threat to water quality. Such grouped operations might then get their own waiver or set of waste discharge requirements. Also requested were comments on factors to consider in developing and evaluating program alternatives such as costs/economics. Under consideration is adding dry land farming and non-irrigated pasture to the program, mainly due to its potential impact on storm water runoff.

A draft report on the long term program is expected in Fall 2008. The draft environmental impact report is due Spring 2009 with a final certification by Regional Water Board expected by Summer 2009.

Regional Coalition News

Eastside SJV Almond, Alfalfa Growers Given Heads Up on Insecticide Drift

Water samples taken in any given month don't typically point to treatments on one or two crops reaching waterways at the same time. But after nine waterways were found to have chlorpyrifos exceedances in July 2007 sampling by the East San Joaquin Water Quality Coalition, the group narrowed the likely causes to two factors: chlorpyrifos (Lorsban, Lock-On, Govern) applications for Navel Orange Worm (NOW) in almonds and for alfalfa weevil in alfalfa.

To prevent a repeat of the 2007 exceedances, the coalition sent a notification in June to its members with almonds and alfalfa in Stanislaus, Merced and Madera counties who farm along the nine waterways with chlorpyrifos exceedances. Included in the mailings was information on management practices to prevent off-site movement of the insecticide.

The coalition stressed in its notice that while there were multiple exceedances, all but one were not far above water quality standards for chlorpyrifos. The just-over-the-standard numbers could indicate that the likely source was spray drift into the waterways. This conclusion came after tracing the highest exceedance last July, more than 100 times higher than the others, to an almond grower who had irrigation drainage into a creek not long after making a chlorpyrifos hull split application. Drift was also believed to a contributor. The grower committed to the coalition to change management practices to prevent a similar occurrence in 2008.

While the exceedances prompted development of management plans for those nine waterways and future scrutiny by regulators, the coalition points out to members that addressing spray drift is a "doable" management practice and could solve the problem. In particular, following the chlorpyrifos label-required buffer between waterways (50 feet for boom sprayers, 75 feet for orchard sprayers) and not spraying when the wind is blowing toward the waterway. Irrigation drainage after an application should be delayed 48 hours or is discouraged altogether unless the water can be held or treated with the enzyme "LandGuard." Growers along the nine waterways were also asked to fill out a "Management Practice" survey to help confirm to the Regional Water Board that actions were being taken to prevent future problems.

E. coli Study Raises More Questions

Central Valley coalition sampling often finds exceedances of water quality standards for the pathogen indicator, *E. coli*. These repeated findings prompted four water quality coalitions in 2006 to fund a study in hopes of identifying potential causes of the exceedances. Study results subsequently given to the Regional Water Board for review raised questions about the DNA technique used in the analysis and the results, which showed human DNA in often far greater amounts than livestock or poultry.

The study used a cutting edge technique that has the potential to identify source(s) of *E. coli* measured by Coalitions. To better understand the ramifications of the study approach and results, the Regional Water Board, UC Davis scientists and other experts developed a Q&A to assist in planning next steps and future studies.

The *E. coli* tested for by watershed coalitions is a pathogen indicator. The new study evaluated DNA from bacteriodes, which are not the same as *E. coli* but are present in the intestines of animals. Bacteriodes are not typically used as a pathogen indicator but like *E. coli*, they also come from animal intestines.

Multiple sources of bacteroides DNA were found in the coalition samples, including human, bovine and avian. Measurements gave percentages of the total bacteroides DNA in the sample and could represent very small or very large amounts of bacteria. The DNA technique did not determine how much of each source was identified. What the study did show is that at most sites and during the period of the sampling, a greater percentage of human bacteriodes than animal bacteriodes was present.

Bacteroides are intestinal bacteria that do not like oxygen and survive only days in the environment. It cannot multiply outside of the intestinal tract. Bacteriodes may be a pathogen indicator, but it is not commonly used in environmental monitoring for regulatory programs. The relationship with disease-causing organisms is unknown, and there are no standard EPA methodologies for Bacteroides DNA analyses.

Bottom line for the coalition studies, according to the Q&A: "...results cannot be used for regulatory purposes at this time, and they cannot be considered to be a definitive answer for the source of *E. coli* exceedances, or for disease-causing organisms. Any relationship between the presence of bacteroides and *E. coli* and/or disease-causing organisms has not been shown to exist."

More information on the *E. coli* report and future studies can be found in the draft document "Fact Sheet: Pathogen Source Identification Study, 1 May 2008" posted under "News" at www.esjcoalition.org.

Westside San Joaquin Prioritizes Waterway Actions

Multiple exceedances of state water standards in the 19 Westside San Joaquin River Watershed Coalition sampling sites have triggered development of "Management Plans" for those waterways. The WSJRWC covers 450,000 acres in the region from Tracy to Mendota, west of the San Joaquin River. Management plans are work plans, written by the Coalition and approved by the Regional Water Board, that describe known and potential sources of a water quality problems and plan ways to begin addressing the problem.

The Westside Coalition's plan, currently being reviewed by the Water Board, identifies Hospital Creek and Ingram Creek as priority watersheds to begin focusing implementation efforts to address the exceedances. The plans outline approaches for pesticides including chlorpyrifos and pyrethroids, the two most common exceedances plus constituents such as copper and other pesticides. Landowners and growers who farm next to or in close proximity to the two creeks are the primary focus of mailings and notices for local workshops on BMPs to solve the water quality problems identified by the coalition sampling.

Irrigated Lands Program Gets New Leader

Joe Karkoski has been named program manager for the Irrigated Lands Regulatory Program for the Regional Water Board. Karkoski, who replaces Bill Croyle, formerly led the Regional Water Board TMDL unit where he was involved in developing the diazinon TMDL for the Sacramento River. Karkoski previously worked for US EPA Region 9 on agricultural water issues. He is currently based in Rancho Cordova.

Spanish Language Farm Worker Safety Booklet

Protección de su Salud: Proteccion de Trabajadores Expuestos a Pesticidas is a Spanish language comic book format novella that provides important health and safety messages to farm workers. The U.S. EPA has approved the novella as appropriate educational material for workers who have received or are receiving the required WPS training. The novella is published by Western Plant Health Association (WPHA) and Coalition for Urban and Rural Environmental Stewardship (CURES) and is being distributed to workers through government, rural health, farmers and farm worker organizations in the West. To order call 916-574-9744 or e-mail Richard Cornett at richardc@healthyplants.org. The novella will be mailed free plus shipping charges.

In the News

DDT From the Old Days Says DPR

Water sampling of Central Valley waterways sometimes shows pesticides used in recent farm production. But an insecticide applied to crops more than 30 years ago? Apparently that's what the California Department of Pesticide Regulation (DPR) said after reviewing data showing water and stream sediments with the long-banned insecticide DDT and its degradates DDD and DDE. Activists, upon seeing the coalition results with DDT in numerous waterways, questioned whether Central Valley farmers were continuing to use the insecticide.

In a report to the Regional Water Board, DPR cited scientific studies where DDT was found in high concentrations in Central Valley soils, sediment and surface waters since 1985. Their studies confirmed that DDT and its degradates are long lived and residues are probably vestiges of DDT use prior to its ban in 1972. Coalition sampling sites with relatively high concentrations were on small, agricultural dominated water bodies with the highest concentrations found in Westside tributaries to the San Joaquin River.

DPR's Residue Monitoring Program screens fresh produce for pesticide residues, including DDT and its degradates. Of the more than 58,000 samples analyzed from 1996-2006, 44 showed DDT residues. Residue levels were low and found on crops with edible portions that grow in soil, fruits that rests on soil or vegetative growth habits that readily trap soil particles. These results were not unexpected in crops grown where DDT was applied in the past and where DDT residues still reside in soil, said the report.

The DPR report concluded by stating there is "virtually no evidence to support the notion that illegal use of DDT is widespread in California."

Enzyme Shows Dormant Season Potential

Orchard field trials with LandGuard OP-A found the enzyme based technology shows promise for rapidly degrading diazinon residues in dormant season storm run-off. Previous studies showed the enzyme, when applied to irrigation drain water, was effective in degrading chlorpyrifos (Lorsban) washed from an alfalfa field.

In the latest field trial, LandGuard OP-A was applied to runoff draining from a plum orchard in Sacramento Valley. The study, conducted by CURES, used sprinklers to simulate a major rain event after applying Diazinon AG 500 to the orchard in December 2007. At the lowest enzyme rate, diazinon residues were reduced by up to 99% immediately after dosing and could be further reduced with longer enzyme exposure times.

Past dormant orchard studies by UC Davis showed the enzyme to be effective when applied to the orchard floor after a diazinon treatment. With this method, the enzyme degrades diazinon on the soil surface before rain can wash off the insecticide. These applications require treating all areas of an orchard with enzymes where run-off could reach sensitive aquatic areas.

Spill Prompts Reminder: Check Plastic Fertilizer Tanks

A fertilizer spill that reached the Merced River is prompting a reminder to growers with on farm tanks: check the condition and location of plastic fertilizer tanks.

The spill occurred in April when a delivery truck was off loading liquid fertilizer into a 1000 gallon white plastic tank located near an irrigation canal. The grower noticed a small leak mid way up the tank just as it reached full. Before the tank could be pumped out, the crack burst open, soaking the farmer with fertilizer. Several hundred gallons flowed into a nearby irrigation canal, which eventually drains into the Merced River, before the spill could be blocked. The plastic tank was reportedly more than five years old. The local fire department and water quality officials, including the California Department of Fish and Game, inspected the area and said the cleanup was thorough and reported fish were not threatened. The incident serves as a reminder to growers to check the condition of all outdoor plastic fertilizer tanks exposed to sunlight. One option is to replace older tanks with newer black plastic tanks made with material resistant to sunlight degradation. Other good practices are locating fertilizer tanks away from unprotected wellheads and building containment or levees between tanks and nearby waterways.

Ask the Water Board

Watershed Coalition News asked readers to pose questions to the Water Board on issues pose questions to the Water Board. The question this issue is answered by Joe Karkoski, Program Manager for the Irrigated Lands Regulatory Program, Central Valley Regional Water Quality Control Board.

I'm an orchard grower who hasn't joined the water quality coalition in my area. How do I sign up?

The Regional Water Board changed the requirements for joining a coalition in April 2008. Growers who are currently not a member of a coalition have a limited opportunity to join without being subject to Water Board fees or penalties. At this time, the Regional Water Board and coalitions are approving applications to join if certain conditions are met. It is important to note that membership in a coalition is a privilege that depends on the good faith efforts of growers to protect water quality. By joining the coalition, a landowner or operator is agreeing to implement management practices that minimize or eliminate fertilizer, pesticide and sediment runoff. In addition, you must cooperate with your local watershed coalition and take corrective action should water quality problems be tracked back to your farming operation. Once your application is approved, each coalition in the Central Valley will have slightly different requirements for new members regarding payment of back dues. Contact you local coalition about their specific information *(Editors note: see back page for contact information)*. Applications to join a coalition are available to download on the Regional Water Board website (http://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/app_approval/index.shtml). There are two forms, labeled ILP-5.0 and ILP-5.1. If none of the conditions on 5.0 apply to your operation, you must also complete form 5.1. The basic information required for a complete application includes crop type, assessor parcel number(s) and county of operation (detailed instructions are included on the forms). Answer all the questions on the forms and mail to our office in Rancho Cordova. If growers with irrigated crop land do not obtain regulatory coverage for their waste discharges under a coalition group or Individual Irrigated Lands Conditional Waiver, they must file a Report of Waste Discharge and filing fee with the Regional Water Board to obtain a grower-specific permit (also referred to as Waste Discharge Requirements).

Send your questions for "Ask the Water Board" to pklassen@unwiredbb.com.

Central Valley Watershed Coalitions Contact Information

Sacramento Valley

Sacramento Valley Water Quality Coalition
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San Joaquin Valley & Delta

San Joaquin County & Delta Water Quality Coalition

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Dinuba, CA 93618-3203

RESOURCE GUIDE

Sources of Best Management Practice Information in Stanislaus County

Agency	Program Description	Publications	Outreach
Natural Resources Conservation Service **Modesto Service Center** 3800 Cornucopia Way Ste. E Modesto, CA 95358-9494 (209) 491-9320 (209) 491-9331 fax	Information on BMPs related to land management, sediment transport and habitat protection, among other areas.	The NRCS "Index of Conservation Practices and Specifications" list hundreds of practices and information on installation.	NRCS organizes field days and workshops to promote adoption of management practices. Funding: Landowners are eligible for grants and other financial assistance through the Environmental Quality Incentive Program (EQIP) and (other programs).
University of California Cooperative Extension **Stanislaus County** 3800 Cornucopia Way Modesto, CA 95358 (209) 525-6800 (209) 525-6840	Information on pest management, irrigation management and pesticide safety among other areas. Also performs research on various production practices.	The U.C Agriculture and Natural Resources (UCANR) Publications department has developed "Production Manuals" for six major crops and "Integrated Pest Management (IPM) Guidelines" for 29 crops grown in the Central Valley. These publications include information on low risk pest and nutrient management practices that would often be components of an overall farm plan to protect surface water.	UC Farm Advisors organize regular grower update meetings on various crop and pest management issues. Continuing education credits are provided to growers who attend for maintaining county pesticide application permits.
Commodity Groups **(Almonds, Peaches, Tomatoes, Walnuts, Melons)** **The Almond Board of California** 1150 Ninth St., Ste. 1500 Modesto, CA 95354 (209) 549-8262 (209) 549-8267 fax **www.almondboard.com** **www.almondsarein.com** **California Melon Research Advisory Board** 531-D North Alta Ave. Dinuba, CA 93618 (559) 591-0435 (559) 591-5744	Information on production practices, research funding; outreach programs to growers.	Each commodity group has various reference materials for growers outlining crop management practices.	Each commodity group holds an annual meeting along with regional meetings with presentations on production issues. Each group also has periodic in-house newsletters that cover various marketing and production issues. • Almond Board of California: The board is funding research on low risk approaches to control overwintering pests and has funded research on the effectiveness of BMPs used in almonds.

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Sources of Best Management Practice Information in Stanislaus County

Agency	Program Description	Publications	Outreach
Commodity Groups (Almonds, Melons, Tomatoes, Walnuts) **California Tomato Commission** 1625 E. Shaw Ave., Ste. 22 Fresno, CA 93710 (559) 230-0116 (559) 230-0635 **www.tomato.org** **Processing Tomato Advisory Board** 1450 Halyard Dr., Ste. 11 West Sacramento, CA 95798 (916) 371-3470 (916) 371-3476 **www.ptab.org** **California Walnut Commission** 1540 River Park Dr., Ste. 203 Sacramento, CA 95815 (916) 646-3807 (916) 923-2548 **www.walnut.org**	Information on production practices, research funding; outreach programs to growers.	Each commodity group has various reference materials for growers outlining crop management practices.	Each commodity group holds an annual meeting along with regional meetings with presentations on production issues. Each group also has periodic in-house newsletters that cover various marketing and production issues.
Stanislaus County Agricultural Commissioner Dennis Gudgel 3800 Cornucopia Way, Ste. B Modesto, CA 95358 (209) 525-4730 (209) 525-4790 **agcom50@mail.co.stanislaus.ca.us**	County regulatory enforcement agency for pesticide use and handling.	Stanislaus County has a manual or handbook that outlines local and state regulations regarding handling and applying of pesticides. Growers review these manuals in advance of tests taken to receive a Pesticide Applicator Permit, a license needed to purchase and apply pesticides.	Stanislaus County Agricultural Commissioner holds periodic continuing education meetings for growers and Pest Control Advisors (PCAs). These meetings cover regulations, production practices and various subjects related to proper use and handling of pesticides.
Coalition for Urban/ Rural Environmental Stewardship CURES Parry Klassen 531-D North Alta Ave. Dinuba, CA 93618 (559) 591-1995 **www.curesworks.org**	A non-profit education organization focusing on promoting pesticide and nutrient BMPs; also develops and coordinates research projects on BMPs.	CURES produces booklets on BMPs for orchard, row crops and other uses of pesticides.	CURES organizes and develops presentations for grower and PCA meetings that cover water regulations and various BMPs to protect surface water.

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Resource Conservations Districts West Stanislaus Resource Conservation District 20 N. El Circulo Patterson, CA 95363 (209) 892-3026 (209) 892-5136 **www.carcd.org/wisp/weststanislaus/index.htm**	Grower managed entity based in Stanislaus County that coordinates projects and programs related to resource management.		RCD organizes periodic educational workshops and meetings on subjects related to resource conservation.
Farm Input Suppliers	Private firms that sell farm inputs and provide information through licensed Pest Control Advisors (PCAs)	Farm input suppliers distribute product specific information including product labels, Material Safety Data Sheets (MSDS) and other publications related to proper use of farm inputs such as pesticides and nutrients.	Staff PCAs have frequent personal contact with landowners to advise on pesticide recommendations
Natural Resources Conservation Service (NRCS)- EQIP Program Modesto Service Center 3800 Cornucopia Way Ste. E Modesto, CA 95358-9494 (209) 491-9320 (209) 491-9331 fax	The Environmental Quality Incentives Program (EQIP) was reauthorized in the Farm Security and Rural Investment Act of 2002 (Farm Bill) to provide a voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals. EQIP offers financial and technical help to assist eligible participants install or implement structural and management practices on eligible agricultural land.		EQIP activities are carried out according to an environmental quality incentives program plan of operations developed in conjunction with the producer that identifies the appropriate conservation practice or practices to address the resource concerns. The practices are subject to NRCS technical standards adapted for local conditions. The local conservation district approves the plan.
California Water Institute California State University, Fresno 6014 N. Cedar Fresno, CA 93710 (559) 298-6072 (559) 298-3576 fax **www.californiawater.org**	Established through Proposition 13 funding, CWI is an academic center of excellence for research, education and policy analysis of issues involving water resources.	CWI and its sister organizations at California State University, Fresno have created and distributed materials and online resources regarding irrigation scheduling and planning. These materials have included methods and tools for managing irrigation practices so they are most effective and efficient.	CWI and its sister organizations at Fresno State have also organized numerous seminars educating farmers and irrigation technicians on irrigation management practices and how they can be done in a more efficient way to save both water and energy.
Westside San Joaquin River Watershed Coalition Joe McGahan, Watershed Coordinator 559-582-9237 **jmcgahan@summerseng.com**	Formed to assist growers in complying with the Irrigated Lands Regulatory Program of the Central Valley Regional Water Quality Control Board.	Quarterly newsletter providing coalition updates.	Organizes grower educational meetings that provide updates on water monitoring results and potential management practices to address identified problems. Meetings often held in conjunction with water districts, county agricultural commissioners and others.

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BMP Suppliers **PAM** **Western Farm Service** Fred Strauss 35100 S. Hwy. 33 Vernalis, CA 95385 209-835-7597 209-541-7562 cell	PAM: A product applied to irrigation water for the reduction of sediment transport in irrigation drain water.		

Contacts