Neonicotinoid Product Stewardship Program

Management Practices to Protect Surface Water

Neonicotinoid Insecticides

Stewardship Practices for Protecting Water

California Central Coast Vegetable Crops

Whenever Neonicotinoid (neonic) insecticide applications are made to vegetable crops near waterways and other sensitive sites, growers and applicators should be aware of the potential for drift or runoff to these areas. Neonic insecticides have the potential to be carried off-site as well as adhere to soil particles and be transported in sediment moving off a field. If neonics move off-site, they can be measured and possibly 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 BMPs 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 necessary tools to complete a successful spray application while avoiding off-site impacts.

Severe Consequences For Mistakes

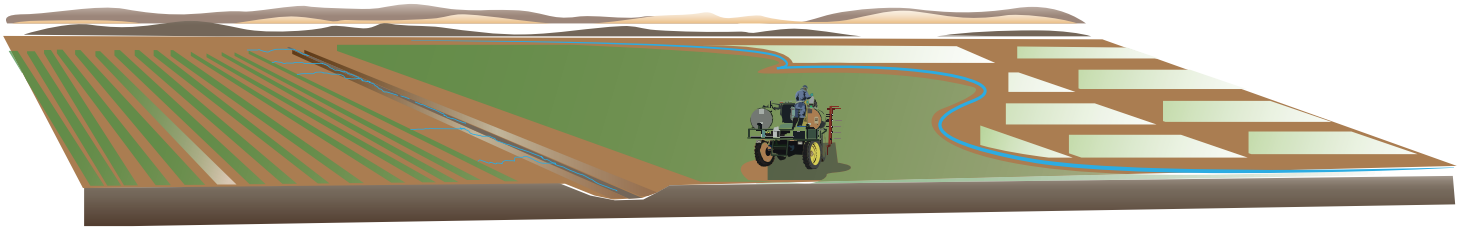
Consequences for application mistakes or ignoring good practices can have wide reaching impacts throughout the agricultural community. Product uses could be dramatically restricted or cancelled, hindering our ability and flexibility to efficiently produce a profitable crop.

Each individual who recommends, handles, or uses pesticides has the responsibility 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 neonic insectide, or any pesticide application. Visit the University of California IPM website www.ipm.ucdavis.edu for information on IPM practices for your specific crop.



Neonic Stewardship Recommendations

This publication outlines stewardship practice recommendations useful during the handling and application of neonic insecticides. These recommendations are based on language from product labels and other expert resources. They are specific guidelines on good stewardship practices useful for 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, potholes or natural ponds, estuaries and commercial fish ponds.
3. Adopt good irrigation practices to minimize or eliminate off-site movement of water and sediments which may contain neonic residues.
4. Avoid applications just prior to a rainfall event or irrigation to minimize the potential for runoff. Check weather forecasts before starting an application.
5. Risk of exposure to aquatic and sensitive areas can be reduced by avoiding applications when wind is blowing toward the sensitive areas.

Always follow all product label instructions. See your county guidelines for product-specific restrictions and recommendations.

6. Avoid aerial applications. 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 neonic 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 label rate that provides efficacy when applied through your equipment. However, be aware of the potential impact that lower label rates could have on control of pests and resistance management programs.
10. Always shut off nozzles at the row end and before making the turn.
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 labels, MSDS and county permits on hand during treatments.
15. Adopt on-site practices to reduce runoff (see following section).

On-Site Practices

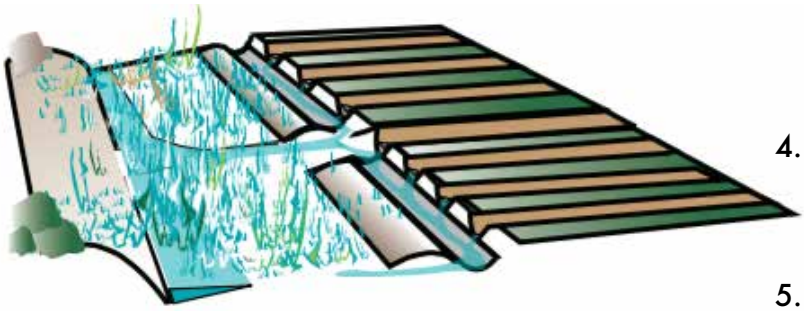
On-site practices are approaches for managing soil, water, pesticides and nutrients for sustainable agricultural production that minimize environmental impacts.

The goal is to:

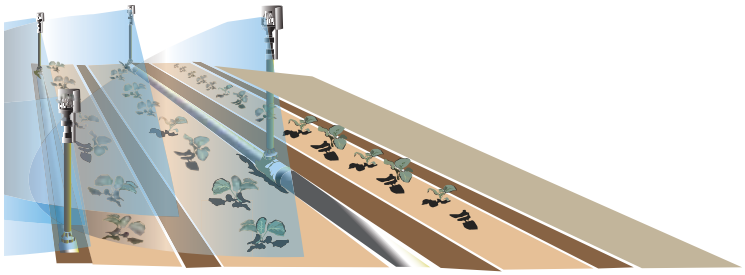
- Eliminate or reduce sediment movement from the field.
- Eliminate or reduce flows of runoff water carrying dissolved pesticides and nutrients.

These practices include but are not limited to:

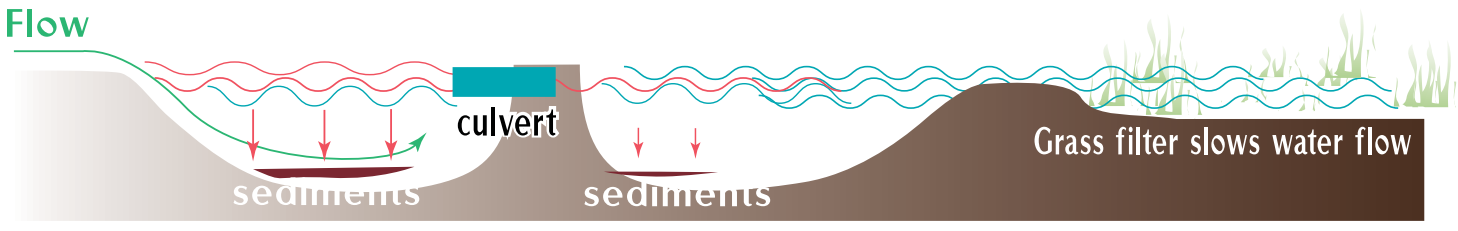
1. Managing irrigation tailwater and occasional rainfall runoff to eliminate or minimize the impact of off-site movement of sediment using:
    - Tailwater return systems to recirculate tailwater and reapply to other parts of the field.



- Sediment basins or holding ponds that retain runoff for a period of time to allow sediment to settle out.



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.
3. Use vegetative 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.
    - Absorption of pesticides to plant surfaces.
4. Time spray application to allow at least 48 hours between application and irrigation or rainfall.
5. Use good field sanitation practices to reduce pest population buildup.
    - Disk fields immediately after harvest to avoid pest buildup on harvested plants and migration to other crops.

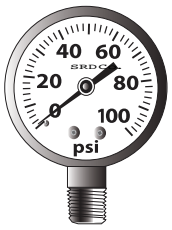


Properly Calibrate Sprayer

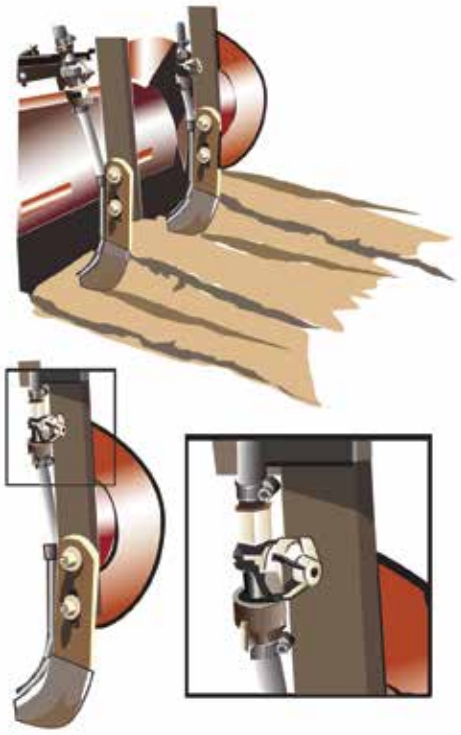
- Calibrate equipment prior to each application. Note results and settings for future calibrations.
- The three parameters needed for a complete calibration.
    - Travel speed
    - Output rate
    - Desired volume

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 inadequate uniformity and coverage 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.
8. Install check valves on nozzles to eliminate dribble when boom is shut off.



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.

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

Carefully Select Mixing and Loading Site

- 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.

- 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.

- Mix and load on a site not prone to runoff such as the upgradient end of a field. 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 ½ 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, field drains or other water sources, etc.

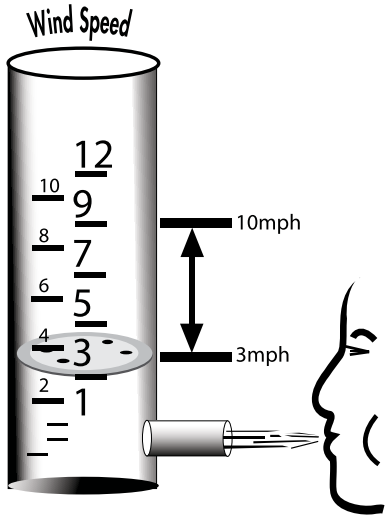
12. Check with county for proper disposal methods for empty pesticide containers.

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

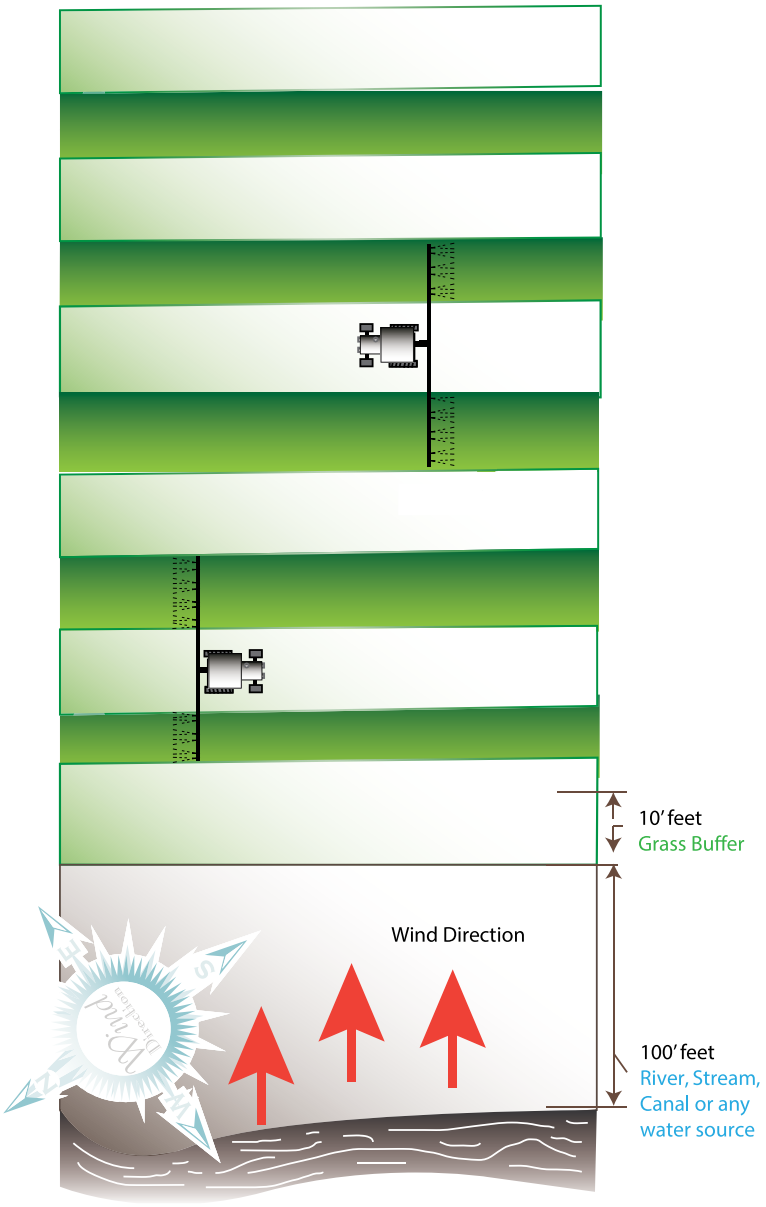
Should a neonic application result in a complaint, the best way to resolve the conflict is with accurate and complete records of the application conditions. Recording a few simple facts could prove valuable in the event of an incident or complaint.

- Compile and maintain a summary report on weather conditions prior to, during and after the application. Also note change in conditions when stopping to refill or adjust equipment.

- 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.

- Local weather services, Internet services (government and private providers) and weather stations at local airports can be sources of current and forecasted weather information.

- Prepare a field site sketch with sensitive areas and precautions taken.



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.
- Make sure there is no residual liquid in the tank from a previous application.

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