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Information

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Check out the Pesticide Education and Assessment Program web site at ***http://pesticide.umd.edu***

Protecting Groundwater from Pesticides

Pesticide Information Leaflet No. 9

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Once thought to be safe from contamination, groundwater is now a threatened resource. Recharge areas often lie close to the surface and may be significantly affected by agricultural, residential, or industrial activities. Once contaminated, groundwater is difficult or impossible to clean. Pesticide users, from commercial operators treating large acreages to homeowners treating their lawns, can take the protective measures discussed in this leaflet to prevent contamination of our water resources.

BEFORE APPLICATION

Identify the vulnerability of the site. Pesticide Information Leaflet No. 8 identifies factors that contribute to groundwater vulnerability. Reduced-tillage cropping systems, surface grading, contour planting and strip cropping can reduce pesticide runoff. Dikes or a border of untreated vegetation can slow the movement of runoff water and keep it out of wells, sinkholes, water bodies, and other sensitive areas.

Evaluate the need for a pesticide. Use an Integrated Pest Management (IPM) approach, combining scientifically sound control strategies with monitoring of pest populations. As part of an IPM program, use pesticides only when necessary and only in amounts that will adequately control the pest. Ask your County Cooperative Extension office for information on IPM programs.

Choose a pesticide less likely to leach. Check the label for warnings about potential to leach or contaminate groundwater.

Evaluate the method and frequency of pesticide application. Using pesticides applied at the lowest concentration that will control the pest, and the fewest number of

times, decreases the likelihood of groundwater contamination.

Check the well system. Properly seal new wells, and inspect old wells. Check valves to ensure that seals are adequate. This will help keep accidentally contaminated water from entering wells and, eventually, groundwater.

Monitor weather conditions. Unless the label directs that a pesticide should be watered in after application, pesticides should not be applied when a rain event is expected.

DURING APPLICATION

Read and follow label directions. Many pesticide labels list use instructions or precautions designed to avoid groundwater contamination.

Apply the pesticide at the right time. Fewer applications are required if they are carefully timed in relation to the pest's life cycle. Check the label and ask your County Cooperative Extension for help on timing.

Use the correct rate. Do not use more than the labeled rate. Increasing the dosage increases the cost of pest control, contributes to the potential for resistance development by the pest, and increases chances of environmental contamination.

Mix only the amount needed for the job. Leftover pesticide usually cannot be stored or disposed of easily and safely. Mixing only the amount you need will remove the temptation to overapply.

Calibrate and maintain equipment. Calibrating application equipment regularly reduces the chances of over- or underapplying. Check equipment frequently for leaks and malfunctions.

Avoid back-siphoning and spills. Be especially careful near wells or other water sources. Most contamination incidents are thought to have occurred from carelessness at the mixing/loading site. Prevent back-siphoning by keeping the end of the hose above the water level in the spray tank. Install a backflow prevention device (air gap or check valve) on the filling pipe. If a spill does occur, use every precaution to protect water sources. Check with your County Cooperative Extension office for information on handling small spills.

Direct the application properly. Avoid overspraying the target site. This will help to prevent drift and runoff.

Avoid drift. Do not make applications during windy conditions or during temperature inversions. Drift of pesticide off target and over water sources can contribute to contamination.

Avoid application to bare ground. Never apply pesticide to bare ground unless the label allows it. On sites where groundwater is vulnerable, try to choose pesticides that can be applied post-emergence.

Consider using spray additives. Commercially available spray additives may increase retention on the foliage, decreasing the likelihood that pesticide will be removed by rain or irrigation.

Dispose of excess spray according to label directions. The practice of disposing of leftover spray mix by repeatedly spraying it out at the mixing area or other site can contribute significantly to contamination. Instead, excess spray mixture must be applied only on a labeled site in accordance with all label directions.

Exercise care with irrigation and chemigation. Special care should be used during chemigation, as the irrigation water may carry pesticides down through the soil into groundwater. Four safeguards can help to avoid contamination: 1.) an interlock connecting the chemical injection equipment with the irrigation pump; 2.) a check valve between the irrigation pump and the point of injection; 3.) a vacuum breaker behind the check valve; and 4.) a low-pressure drain behind the check valve.

AFTER APPLICATION

Store pesticides safely. Pesticides should be stored in their original containers in a cool, well-ventilated, locked location away from pumps and water sources.

Dispose of pesticides and containers safely. Triple rinse pesticide containers and return the rinsate to the spray tank. Puncture the container so it cannot be reused, and dispose of it in a licensed sanitary landfill. Follow the label for proper disposal of leftover pesticides.

Maintain records of pesticide use. Keep records of the date of application, identity and rate of the pesticide applied, weather conditions, and name of the applicator.

Use care with irrigation after pesticide applications. Because many pesticides move downward through the soil with water, it is best to avoid irrigation immediately after pesticide applications unless the label directions require it. Runoff should be avoided by using a minimum amount of irrigation water. Avoiding runoff will reduce soil erosion and pesticide entry into water.

Information in this leaflet was adapted from the Maryland Pesticide Applicator Training Series Core Manual; Ohio State Extension Bulletin 820; and the groundwater educational package developed by the New York State Water Resources Institute, Cornell Cooperative Extension, and Office of Pesticide Information and Coordination, University of California Cooperative Extension.