ALABAMA COOPERATIVE Extension SYSTEM

ANR-790-1.2.4

ALABAMA A&M AND AUBURN UNIVERSITIES

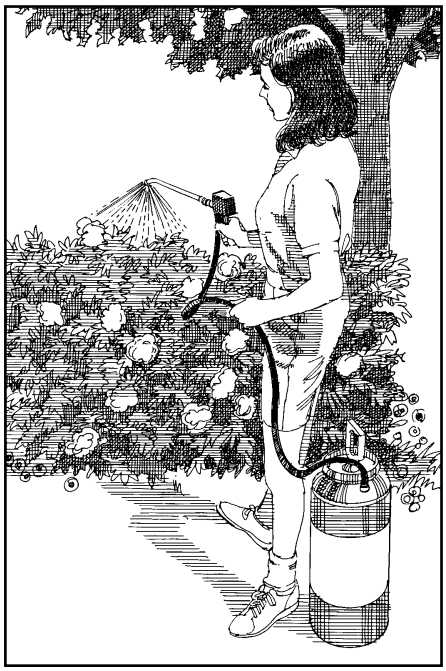
Protecting Water Quality

Using Pesticides Safely Around Your Home

You can make a difference when it comes to preserving the quality of your water. Many of your routine activities such as pest control and home landscape fertilization can pose a threat to water quality if not done correctly.

To reduce the risk of water pollution from pesticide chemicals around your home, follow this advice:

- Reduce the amount of pesticides you use.
- Handle and use all pesticides safely to prevent water contamination.
- Properly dispose of containers as well as unused or unwanted chemicals.



Alternatives To Pesticide Use

There are numerous methods for controlling pests, many of which do not involve the use of pesticides. Overuse of insecticide may actually create a problem by killing beneficial insects in some cases. Select lawn, garden, and ornamental plants that are well adapted to your location. Choose varieties that have disease and insect resistance or tolerance and no history of pest-related problems. Your Extension agent should be able to help you in selecting adapted plants that require minimal pest management.

Practices such as mulching, hand weeding, and other cultural methods are very effective. In some cases, these practices alone may be sufficient to control pests. In other cases, they can be integrated with pesticide use to reduce the overall amount of pesticide needed.

The process of using both cultural practices and reduced amounts of pesticides is called integrated pest management or IPM. Integrated pest management strategies have been used in field crops for a number of years and are discussed in detail in many Extension publications. These same or similar strategies should work around the home to reduce pesticide use.

Recommendations For Safe And Effective Pesticide Use

Remember that no pesticide is completely safe because all are poisons and should be handled with care. The safety comparison of pesticides is expressed in relative terms, because some pesticides are more toxic than others. Look for one of the following signal words: **Danger, Warning,** or **Caution** on the front of the label. It will tell you how poisonous a pesticide is if swallowed, inhaled, or absorbed through skin. **Danger** means highly poisonous; **Warning** means moderately poisonous; and **Caution** means least hazardous.

There are many valid recommendations on the safe use of pesticides. These recommendations are designed to protect personal safety and to reduce the incidence of environmental contamination of nontargeted areas.

Purchasing Pesticides

1. Use a pesticide only after you have exhausted all other control methods.

2. Select the specific chemical for the pest you want to control. The pesticide label will provide information on which pests are controlled by the chemical selected. Never use a pesticide for any purpose not specified.

3. Buy only the amount of pesticide you need. If you buy more than you can use in the immediate future, you may have to dispose of it later.

4. Store pesticides carefully. Always keep them out of the reach of children and animals. Store flam-

mable pesticides away from flames and hot places. The label will tell you if a pesticide is flammable.

5. Keep pesticides in original containers so that instructions, precautions, and antidotes will always be at hand.

6. **Do not use a restricted-use pesticide** unless you are a certified applicator. These products are too dangerous to be used without special training.

Mixing Pesticides

1. Mix only the amount of chemical you intend to use each time.

2. Never mix pesticides with anything unless the label directs you to do so.

3. Keep special tools for measuring and mixing pesticides outside of the house. Never mix pesticides in containers used for foods.

4. Do not breathe vapors or dusts and avoid contact with skin, eyes, and mouth. Wear whatever degree of protective clothing the label recommends. Protect yourself by wearing rubber gloves, long-sleeve shirt, long pants, and goggles. Never eat, drink, or smoke while mixing chemicals, and be sure to wash up after you are done.

5. Always use the least amount of pesticide required. Do not exceed the recommended rate. Follow label directions explicitly. If they call for one part pesticide to a certain amount of water, do not exceed the amount of pesticide. More pesticide will not give more effective control.

Many formulations of pesticides are sold in large quantities that do not include instructions for mixing smaller amounts. Table 1 and Table 2 can be used when mixing smaller amounts.

Selecting Application Equipment

Selecting the appropriate application equipment is a key component of proper pesticide use. By giving some thought to the process, you will be saving money and preserving water quality at the same time.

Table 1. Equivalent Measures For Mixing Various Quantities Of Wettable Powder Pesticides.

Material per 100 gal water	Material per 25 gal water	Material per 5 gal water	Material per 1 gal water
1 lb	4 oz	5 T	1 T
2 lb	8 oz	10 T	2 T
3 lb	12 oz	1 cup	3 T
4 lb	1 lb	1¼ cup	4 T
5 lb	1¼ lb	1½ cup	5 T
6 lb	1½ lb	1⅔ cup	6 T

T=tablespoon
Source: Whalen, 1989b.

Table 2. Equivalent Measures For Mixing Various Quantities Of Liquid Pesticides.

Material per 100 gal water	Material per 25 gal water	Material per 5 gal water	Material per 1 gal water
½ pt	2 oz	1 T	¾ t
1 pt	4 oz	2 T	1½ t
2 pt	8 oz	4 T	3 t
3 pt	12 oz	6 T	4½ t
4 pt	1 pt	8 T	6 t
5 pt	1¼ pt	10 T	7½ t

T=tablespoon
t=teaspoon
Source: Whalen, 1989b.

Pesticide application equipment comes in all shapes, sizes, and prices. Select equipment according to common sense.

Proportioner On Hose-End Sprayer. These inexpensive sprayers are designed to be attached to the end of a garden hose. They operate by metering out a desired amount of chemical into a stream of water. Problems may be encountered with poor spray distribution and clogged nozzles. All hose-end sprayers should have an antisiphon device to prevent backsiphoning of chemicals into your water system.

Compressed Air Sprayer. The spray is generally mixed in a small tank which is carried in your hand or over the shoulder. A uniform concentration spray can be maintained since the pesticide is mixed with a known quantity of water. You can get excellent coverage of plants with this type of sprayer and it is a good choice for treating small fruit trees, vegetables, and ornamentals.

Hand Duster. The duster may consist of a squeeze tube or shaker, a plunger that slides through a tube, or a fan powered by a hand crank. Uniform coverage is difficult to get with any duster. In addition, materials applied with dusters are more susceptible to drift because of their light weight and poor sticking qualities.

Calibrating Sprayers And Spray Patterns

Most homeowners apply pesticides to a given area by mixing 1 or 2 tablespoons of a material and applying it on the problem area. This is acceptable if the label gives a recommendation in tablespoons. Some pesticides, especially those used on the lawn, only give rates per 100 or 500 square feet. Often-

times, the homeowner will solve this problem by guessing how much to use.

A better approach is to calibrate the sprayer. Once this has been done, it will not have to be repeated provided the nozzles remain unchanged and clean and adequate pressure is used.

The following procedures can be used to calibrate a sprayer:

1. Fully pressurize the sprayer and determine the delivery time. This can be done by spraying water through the sprayer into a pint jar for 30 seconds. If after 30 seconds there is ½ cup in the jar, mark this delivery time on the sprayer for future reference.

2. Calculate the area to be treated. The following formulas can help you determine the area of regularly and irregularly shaped areas:

Rectangles: Area = length x width

Circles: Area = 3.14 x radius squared

Triangles: Area = base x height ÷ 2

3. If the area is large, divide it into equal pieces that are equal to the size of the delivery area.

4. Spray an area at a normal speed with water for 30 seconds. Measure the area you sprayed. This tells you how much area you can treat in 30 seconds.

Example: If the label calls for 3 tablespoons of pesticide per 1000 square feet, how much water should you mix the 3 tablespoons with to get proper spray coverage?

Amount of water delivered in 30 seconds = 1 cup

Amount of area covered in 30 seconds = 100 sq ft

Amount of water needed to cover 1000 sq ft =

1 cup covers 100 sq ft

1000 sq ft / 100 sq ft = 10

1 cup x 10 = 10 cups or 80 oz (2.5 qt)

So 3 tablespoons of pesticides must be mixed in 80 ounces of water to achieve proper spray coverage.

The best spray pattern used to cover an area of ground is one that gives uniform coverage with little overlap. The spray pattern should be continuous and uninterrupted. Sometimes overlap may be useful. If good coverage is questionable such as with hose-end sprayers, cut the application rate in half and apply the pesticide first in an east-west pattern, then in a north-south pattern. The spray pattern should form an arc no more than 3 to 4 feet on either side of the applicator.

Applying Pesticides Correctly

1. Keep children and pets away from areas where you mix or apply pesticides. Keep everyone out of the treated area until the spray has dried or for as long as the label directs.

2. Allow adequate ventilation when applying pesticides indoors. When spraying outdoors, close the windows of your house.

3. Do not smoke or eat while mixing or applying pesticides. When applying pesticides, be sure to wear the protective clothing and equipment the label recommends.

4. Do not apply chemicals when it is extremely windy. Generally, the safest times of the day to spray to avoid drift are early morning or late evening. You can also avoid drift by using low pressure and nozzles with large openings. If a moderate wind comes up while you are working, it is best to stop immediately.

5. Guard against runoff of chemicals into streams. Do not spray within 50 feet of streams. Do not spray if you think it is going to rain within an hour. Clean up spills promptly with soil, sawdust, or kitty litter and dispose of properly, or spread the material at its normal recommended rate if it is applied to soil. Avoid over-application when treating lawn, shrubs, or garden.

6. Guard against contamination of groundwater. Do not spray chemicals next to operative wells, abandoned wells, or sink holes. Do not spray where runoff or spills can drain into abandoned wells or sink holes. Do not rinse containers or store chemicals next to wells.

Disposal Of Pesticides

Proper disposal of pesticides and empty containers is as important as proper application. Since pesticides are expensive, mix only the amount you need for immediate application. However, there may be an occasion when you must dispose of excess pesticides.

The goal of proper disposal of pesticides and pesticide containers is to prevent pesticides from getting in the general environment and contaminating water.

Empty Container Disposal

All containers should be completely empty before disposal. In general, both pressurized and nonpressurized containers can be disposed of in home refuse headed for a sanitary landfill. Call your sanitation department to confirm this, however, because some have a special collection center for pesticide containers.

Empty paper pesticide containers should be flattened and rolled for disposal. Then the containers should be wrapped in heavy paper and tied securely with a cord. Plastic, metal, and glass containers must be triple-rinsed prior to disposal. The following instructions should be followed:

1. Empty the container into the mix or spray tank. Allow it to drain for 30 seconds.

2. Fill the container one-quarter full of water.

3. Replace the lid and agitate the container so that the water contacts all the interior surfaces.

4. Pour the contaminated rinse water in a sprayer, allowing the container to drain for 30 seconds after emptying. Do not pour the rinse water onto the ground or street. Rinse water should be sprayed on a site listed on the label.

5. Repeat the procedure at least two more times.

6. Puncture cans so they cannot be reused.

7. Wrap the empty, rinsed container in several layers of newspaper and place it in the garbage for disposal. If the container is glass, tie it securely in thick paper and break it prior to disposal. Aerosol cans should be wrapped but not punctured.

Pesticide Disposal

The best way to dispose of a small quantity of pesticide is to apply it according to label instructions. If you have a small amount of chemical left over, mix it with a large volume of water to make a weak solution and spray over the normal target area to encourage rapid break down. Do the same thing with sprayer rinse solution.

Pesticides banned by EPA may now be classified as hazardous wastes and require special guidelines for disposal. If this information is not available from your county Extension agent call your state environmental agency. In Alabama call the Alabama Department of Environmental Management (ADEM) at 334-271-7700 and ask for the Hazardous Waste Branch of the Land Division for specific instructions on disposal of hazardous waste.

Getting rid of unused or unwanted pesticides in ways other than labeled uses is a problem. Burning, burying, and pouring pesticides down the drain pose potential problems. Some states have periodic collection drives for unwanted pesticides. Alabama has no such program at the present time.

If you are interested in initiating a pesticide collection program and getting the appropriate organizations involved, guidelines are available. A paper entitled "Summary of Interim Guidelines for Disposal of Surplus Pesticides and Pesticide Containers" is available at a cost of $3.00 each. Contact National Technical Information Service, Department of Commerce, 5285 Port Royal Road, Springfield, VA 22151.

References

Whalen, Joanne. 1989a. Pesticide Application, Equipment Calibration, And Spray Patterns. Nonpoint Source Pollution Fact Sheet NPS 4. Delaware Cooperative Extension Service. University of Delaware. Newark, DE.

Whalen, Joanne. 1989b. Pesticide Basics. Nonpoint Source Pollution Fact Sheet NPS 5. Delaware Cooperative Extension Service. University of Delaware. Newark, DE.

ALABAMA COOPERATIVE Extension SYSTEM

ANR-790-1.2.4

This publication, supported in part by a grant from the Alabama Department of Environmental Management and the Tennessee Valley Authority, was prepared by James E. Hairston, *Extension Water Quality Scientist,* assisted by Leigh Stribling, *Technical Writer.*

For more information, call your county Extension office. Look in your telephone directory under your county's name to find the number.

UPS, **New June 1995,** Water Quality 1.2.4