Texas Agricultural Extension Service

esp Environmentally Safe Practices

PROTECTING THE GARDEN

*Denise A. McWilliams and Calvin Finch**

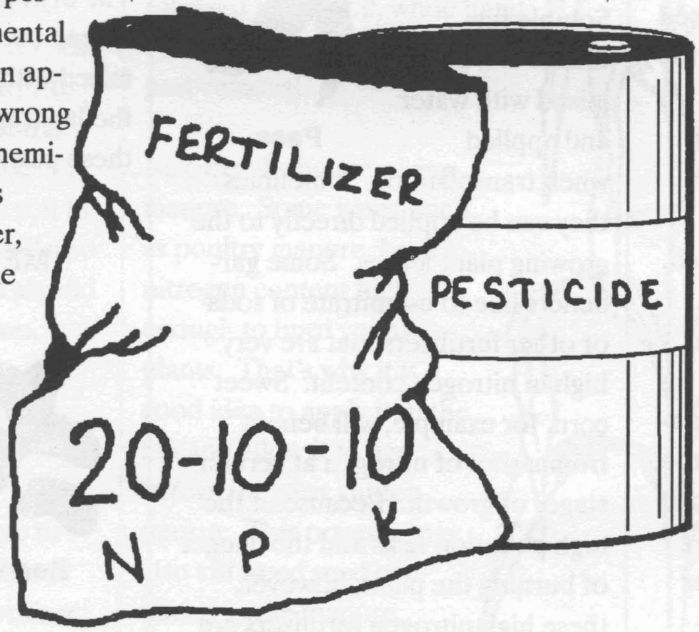
Hard work is the usual requirement for a successful, top producing home garden. In addition, fertilizers and pesticides--used wisely and safely--may enhance the quality and quantity of produce raised. Misuse of these garden chemicals, however, can cause problems.

As you may already know, the nutrients in fertilizers and manures which produce lush, quick growth can also contribute significantly to pollution. Likewise, the chemicals in pesticides can cause environmental problems if misused. When applied incorrectly or at the wrong time these nutrients and chemicals can become pollutants contaminating groundwater, streams and, eventually, the Gulf of Mexico.

FERTILIZERS

Chemical fertilizers for the garden are available in two forms: a granular form which can be spread onto the soil and worked in with a tiller or hand tool; and a water soluble one which can be mixed and sprinkled on the soil or plant leaves.

Fertilizers are identified by their analysis, the three numbers on the container which refer to the percentages of nitrogen, phosphorus and potassium. A 100-pound bag of 10-10-10 fertilizer contains 10 pounds of total nitrogen (N), 10 pounds of available phosphorus (P_2O_5) and 10 pounds of soluble potassium (K_2O). All three of these nutrients can become pollutants when applied incorrectly.



Nitrogen, the most mobile of the three, can leach or travel through the soil very easily and enter the water supply. Nitrogen is the nutrient most responsible for algae blooms in rivers and lakes. While nitrogen is necessary to produce greener, leafier plants, the timing of the application is critical. Too much at the wrong time can lead to an overabundance of foliage with delayed flowering. And if the nitrogen is applied when the plant can't use it, it may leach through the soil.

Phosphorus is necessary for plants to develop strong root systems and produce abundant fruit. Phosphorus that goes unused by plants can attach to soil particles and move during erosion.

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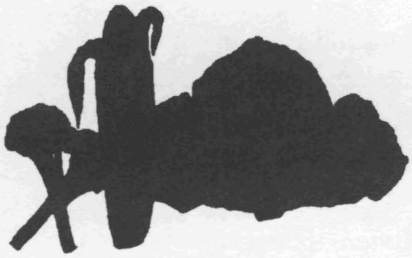
HEAVY FEEDERS



Broccoli Corn Lettuce

Potassium, the third major element, is also important to the strength of plants. It contributes to the formation of protein and carbohydrates. But like the other elements mentioned, potassium will travel during erosion.

Garden vegetables can be grouped into three categories according to their fertilizer requirements. Heavy feeders such as sweet corn, lettuce and broccoli will require more fertilizer than medium feeders such as beans and spinach. Light feeders such as peas have the lowest fertilizer requirement.

Fertilizer can be applied by **broadcasting** granular fertilizer over the entire garden and tilling it into the top 6 inches of the soil according to the directions on the fertilizer bag. This can be wasteful, however, if the fertilizer reaches areas where there are no plants. The active ingredients can leach through the soil and contribute to water pollution.

Another method called **banding** is more efficient. Place a narrow band of fertilizer a few inches on either side of the row of seeds and slightly deeper than the seeds. Do not get closer than about 3 inches, or you may burn the seeds.

LIGHT FEEDERS

Side dressing is applying fertilizer after the plants are up and growing. Soluble fertilizers can be mixed with water and applied when transplanting. Sometimes they can be applied directly to the growing plant leaves. Some gardeners like to use nitrate of soda or other fertilizers that are very high in nitrogen content. Sweet corn, for example, will benefit from a shot of nitrogen at certain stages of growth. Because of the high pollution risks and the danger of burning the plant, however, these high nitrogen fertilizers are not recommended.

Peas

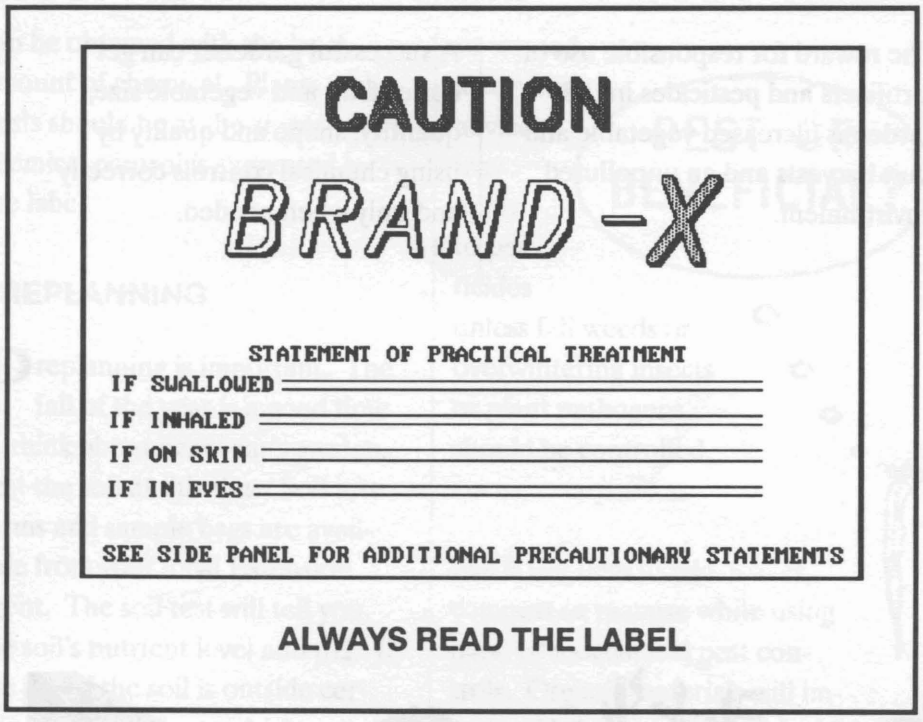
PESTICIDES

Pesticides are chemicals intended to prevent, destroy, repel or mitigate any pest. They also can be used as a plant regulator, defoliant or desiccant. These chemicals come in many forms. They can be in a liquid formulation such as an emulsifiable concentrate (EC or E), a solution (S), a flowable (F or L), an aerosol (A) or a liquefied gas. They also can be found in dry formulations such as dusts (D), granules (G), wettable powders (WP or W), soluble powders (SP) or baits (B).

The dry formulations can be spread onto the soil or plant or mixed with water, depending on the label specifications. Some of these pesticides also can be

MEDIUM FEEDERS

Beans Spinach



worked into the soil with a tiller or rake.

The soluble dry formulations and the liquid formulations can be mixed with water and sprayed or sprinkled on the soil or plant leaves.

Pesticides are identified by their brand or product name, common chemical name, the pest they control and their toxicity.

Because pesticides by nature are toxic, they can be hazardous to people. You can tell the toxicity of a product by reading the signal word on the label.

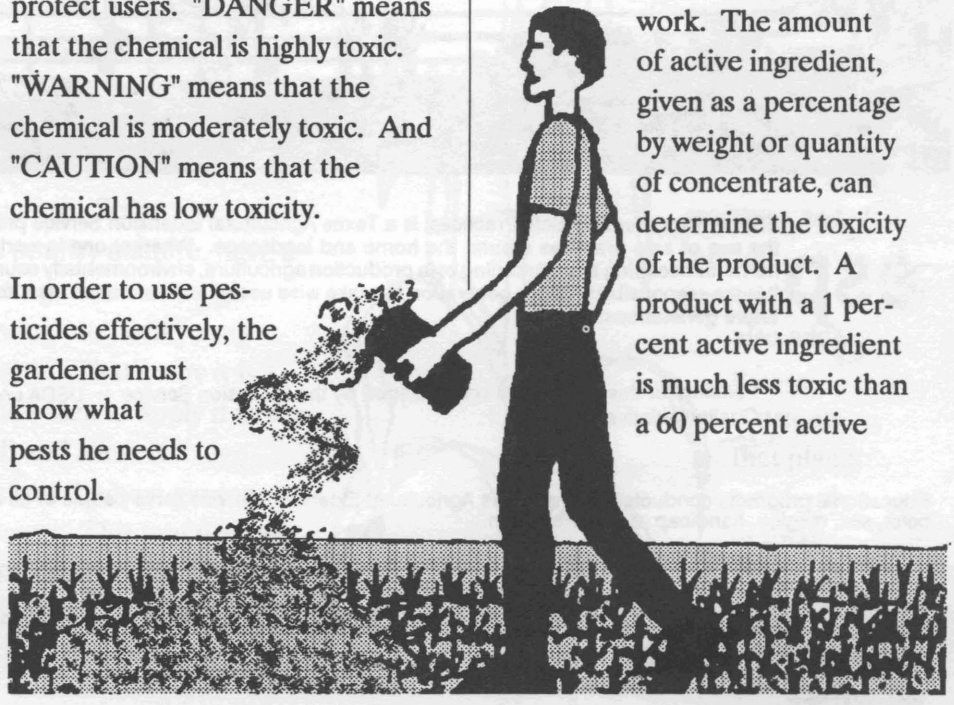
Three signal words are used to protect users. "DANGER" means that the chemical is highly toxic. "WARNING" means that the chemical is moderately toxic. And "CAUTION" means that the chemical has low toxicity.

In order to use pesticides effectively, the gardener must know what pests he needs to control.

The label will state which pests can be controlled by each pesticide. The gardener must make certain that he correctly identifies the pest in order to choose an effective chemical control.

The name of each pesticide is also on the product label. The brand name is the most obvious. It is the name the company uses for the product and the name which appears in ads.

The common chemical name is the general chemical group the product is most easily identified with. This chemical name is usually the main active ingredient which makes the pesticide work. The amount of active ingredient, given as a percentage by weight or quantity of concentrate, can determine the toxicity of the product. A product with a 1 percent active ingredient is much less toxic than a 60 percent active



ingredient formulation of the same quantity of chemical.

Because the active ingredient percentage may vary among similar chemicals it is important for a gardener to read the label carefully for the suggested amount of chemical to apply to a garden.

"Percolation of expensive pesticides below plant root zones not only is an economic loss, but also can contaminate groundwater."

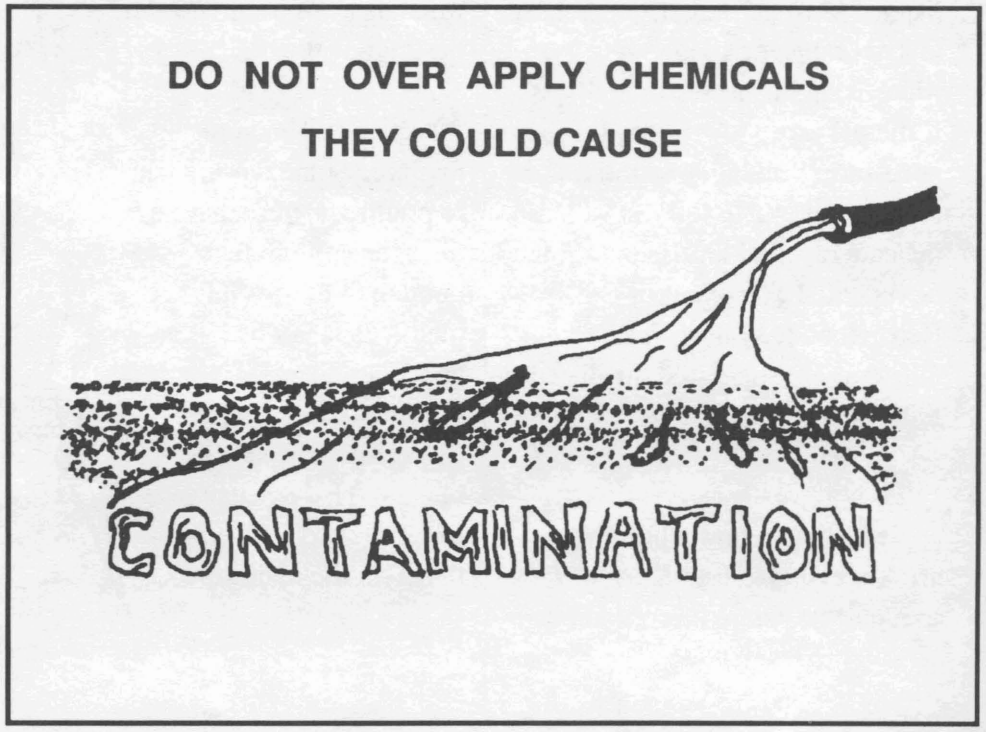
A pesticide user must consider many factors before purchasing a chemical. He must know what pest is to be controlled, whether a chemical control can be used, what products will control the pest, the amount of pesticide needed to cover the targeted area, how to apply the product and what safety concerns are important.

The safety of the gardener is important. If a product label specifies that a user wear protective equipment or clothing when spraying, the suggestion should be followed. If produce is not to be used until a specified time period has elapsed after spraying observe that interval. If a chemical is not labeled for a specific vegetable or fruit, do not apply that product. Read the label for mixing, applying and cleaning instructions before using a pesticide.

SAFETY

The safety to the environment is also important. Do not apply any chemicals when climatic conditions will cause the chemical to move from the targeted area. Spraying or dusting before rain or heavy irrigation can lead to runoff, erosion loss and contamination of nearby streams. Percolation of expensive pesticides below plant root zones not only is an economic loss, but also can contaminate groundwater. Even placing a garden hose on contaminated plants or soil can result in pesticide residues on the garden hose. These residues can back-siphon into drinking water supplies or later be washed onto nontarget areas.

Because of high pollution risks both to yourself and to the environment, use pesticides only according to label specifications. These chemicals should be used only when a pest problem is evident, when the pest is identified as controllable, and alternative measures are not effective. Timing of pesticide use also should be monitored so that effective control

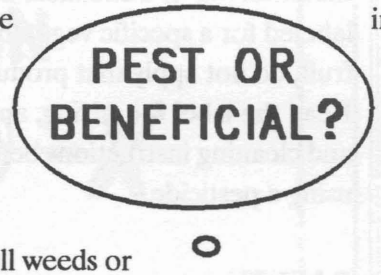


can be obtained with the least amount of chemical. Plants and pests should be at the stages when chemical control is suggested by the label.

PREPLANNING

Preplanning is important. The fall of the year is a good time to think about next year's garden. Test the soil at this time. Soil test forms and sample bags are available from your local Extension agent. The soil test will tell you the soil's nutrient level and pH. If the pH of the soil is outside certain limits, nutrients which are actually in the soil may become unusable or unavailable to the plants. Most garden plants do best in a pH range of about 5.8 to 7.0, which is slightly acidic to neutral. If the pH is too low, it may be necessary to add lime to the soil to raise the pH. The soil test will also indicate nutrient levels, and should be repeated every year or two. Recommended ranges for nutrients are suggested on all Extension soil tests.

Fall is not usually a good time to apply fertilizer, however. There are few plants to use the fertilizer so it may go where it is not needed or wanted. The same advice may apply to pesticides unless fall weeds or overwintering insects or plant pathogens should be controlled.



Fall is the time to add leaves, compost or manure while using hand or mechanical pest controls. Organic materials will improve the soil structure and add nutrients which are slowly released to the soil, while hand weeding can save money on pest removal.

Be careful when applying manure. Some types, such as poultry manure, have a nitrogen content high enough to burn young plants. That's why it is a good idea to apply it in the fall and allow it to age before the next garden season. This practice may also kill weed seed contained in the manure.

After adding organic matter, till it in and then protect the soil by planting a cover crop, also called a green manure crop. Rye and winter wheat are excellent cover crops. They will sprout quickly and grow during the cooler fall months and their roots will protect soil from erosion and runoff. When tilled under the next spring, cover crops will add nutrients and organic matter to the soil.

Organic matter improves the soil structure by increasing its capacity to hold moisture and nutrients. Organic matter also adds micronutrients that plants need only in small amounts.

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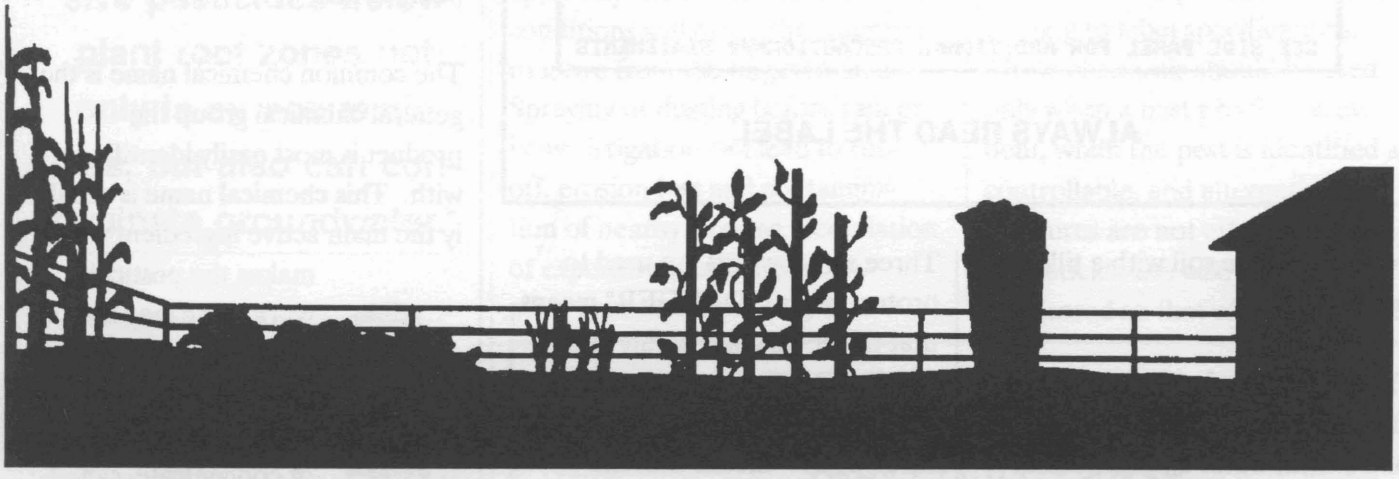
This will encourage your garden to out-compete weeds, insects, disease or other pests that might kill weak plants.

The reward for responsible use of fertilizers and pesticides in the garden is increased vegetable and fruit harvests and an unpolluted environment.

A successful gardener can get better fruit and vegetable size, quantity, shape and quality by using chemical controls correctly and only when needed.



ESP, Environmentally Safe Practices, is a Texas Agricultural Extension Service program designed to promote the use of safe practices around the home and landscape. Whether one is working in household activities, home landscaping and gardening or in production agriculture, environmentally sound practices should be used. It is the responsibility of our generation to make wise use of environmental resources and to extend the use to future generations.

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