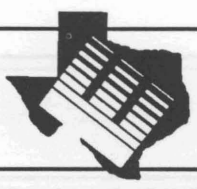


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# Texas Agricultural Extension Service



Environmentally Safe Practices

## Pesticide Waste Minimization and Disposal

*Denise A. McWilliams\**

**M**anagement and disposal of pesticide waste are among major problems pesticide applicators face when using chemicals. Improper management and disposal are threats to public health and the environment. Excess application or improper disposal of remaining mixtures, undiluted chemicals or even pesticide containers can lead to long-term contamination of such finite resources as groundwater, surface waters, food and air.

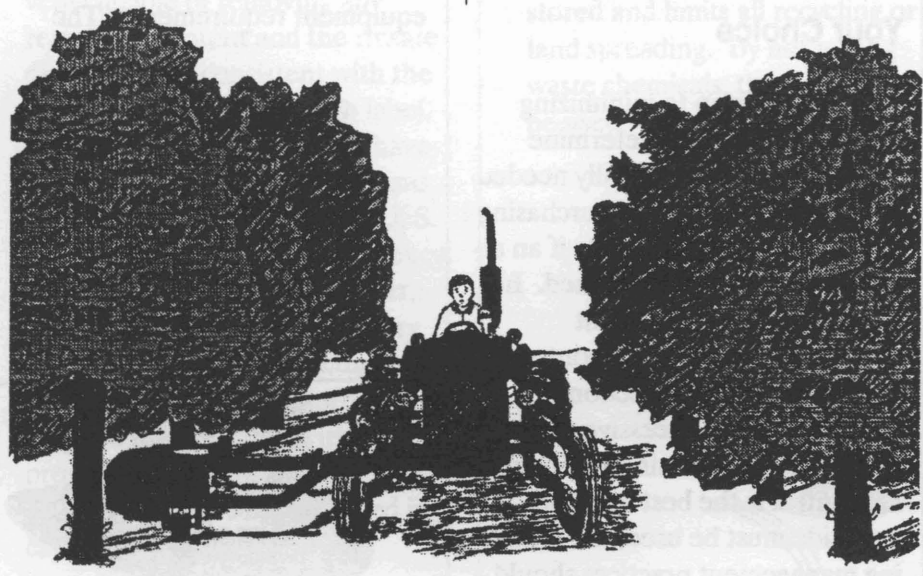
The current process of land disposal will eventually be phased out to alternative, biodegradable or reusable waste management technologies and practices. Indeed, waste collection and management systems and facilities which are backed by educational and technical assistance to applicators may provide environmentally sound practices for disposing of or reusing all wastes.

The difficulty in establishing alternative waste management practices which are environmentally wise, however, is that hundreds of different toxic, corrosive, reactive

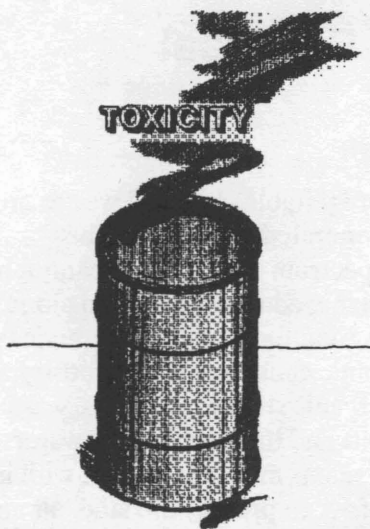
or ignitable chemical wastes are generated each year. This spectrum of chemicals cannot be managed by one method alone. Agricultural wastes, synthetic organic chemicals from industry, inorganic sludges, solvents, waste oils and industrial waste water streams must all be dealt with in order to protect the land, air and water around us.

**"The current process of land disposal will eventually be phased out to alternative, biodegradable or reusable waste management technologies and practices."**

Texas ranks first in the nation in the amount of total hazardous chemical waste produced. The majority of this waste comes from industrial effluents. A "hazardous waste" is any solid waste (i.e., liquids, solids, semi-solids, gels or gases) that may be dangerous to human health and the environment if improperly managed. Agricultural chemicals are listed as hazardous wastes in the 40 Code of Federal Regulations (parts 261.31-261.33) and are defined as



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having one of the characteristics of a hazardous waste. Pesticide wastes which are regulated are those which 1) contain a hazardous sole active ingredient, 2) are hazardous mixtures, 3) are acutely hazardous waste or 4) are hazardous waste as identified by an EPA number.

The Congressional Budget Office estimates that 38 million tons of total hazardous waste were generated in Texas during 1983. This amount was 13 percent of the 300 million ton total for the nation. Pesticides for agricultural use were only a small portion of this total accumulation.

Currently, such concerns as groundwater contamination from all wastes make the need for better management and disposal of these chemicals a concern to

everyone. Cost of hazardous waste cleanup is very expensive, and the cleanup methods are difficult, if not impossible.

In Texas, pesticides are called hazardous, acutely hazardous or Texas regulated wastes if they require specific disposal procedures. Disposal of these chemicals requires completion of a Uniform Hazardous Waste Manifest through the Texas Water Commission before the chemicals can be shipped off-site for treatment, storage or disposal. The cost can be prohibitive, thus making minimization of such waste important. Indeed, preventative actions such as waste minimization must be implemented by all pesticide users.

## Management Practices

### Your Choice

The first step to minimizing any waste is to determine which pest control is really needed for the problem before purchasing the chemical. First, decide if an alternative control can be used. Integrated pest management techniques or biological controls may provide the protection needed, without excessive use of chemicals. Be certain that chemical control is the best solution. If a pesticide must be used, the following management practices should be remembered:

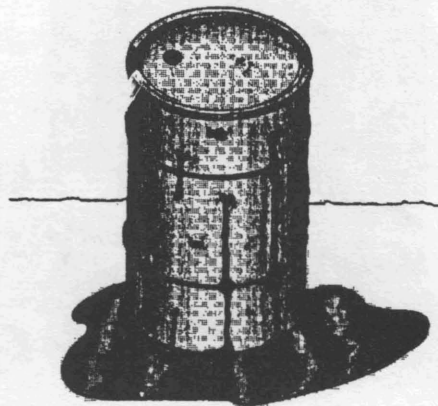
- choose the proper pesticide for the specific problem,
- read the label,
- apply it properly,
- clean up thoroughly,
- store the pesticide securely, and
- dispose of containers safely.

With these basic guidelines in mind, several waste minimization techniques can be implemented.

### Label

Once the need for a pesticide product has been determined, the label should be read again. The label will provide information on applying the chemical. General mixing and spraying directions will inform you of the amount to be used over a specific area and the equipment requirements. The

### CORROSIVITY



label will also mention other requirements for using the pesticide with specific dispersal equipment. Information on applications through irrigation systems, if the chemical is registered for this use, will be explained. The crops, spray timing and mixture specifications for the chemical will also be mentioned in the label information. Any soil characteristics that may influence the chemical activity or alter the use rate will also be given along with any environmental hazards. This information will help to determine the amount of chemical which will be needed. The label also provides some guidance on pesticide and container disposal.

## Storage

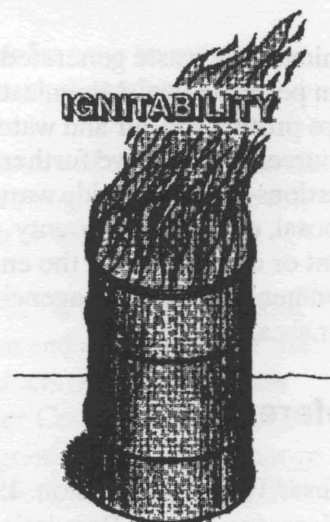
To minimize waste of the chemical purchased, store the chemical in a locked, dry, cool, well-ventilated area. This will insure that the



chemical will maintain its active ability for the short period it is stored before use and will protect others from coming in contact with the chemical. Explicit storage information for individual chemicals can be found on the label. The storage area should be equipped with cleanup supplies such as clay absorbents, in case a spill occurs. Water, food and feed should not be stored in the same locked area as the pesticides. Safely storing the pesticide will prevent loss of the chemical from spills or loss of chemical activity from degradation by heat, sunlight or other environmental factors.

## Application

Besides estimating how much pesticide should be used, more calculation should be done in order to figure the exact amount needed. Pre-application calculations should allow you to figure the exact amount of pesticide needed on a specific land area. Knowing the soil types in the area to be sprayed will give a better ballpark figure of chemical needed over the area. Figure the application changes due to soil type differences or terrain requirements. If areas will not be sprayed because of trees, hills or water sources, these areas should not be figured into the total spray use calibration.



Equipment must be working properly. Test the equipment by making a trial run with water to figure the spray pressure needed to cover the area at the chemical rate suggested on the label. Check all nozzles to make sure they are dispersing similarly. Collect water samples from these trial runs over a certain amount of time. Clogged nozzles or an improperly pressurized boom will make the nozzles spray differently. This will lead to under- or over-applying the chemical. An under-applied spray will lead to excess mixture left in the tank after covering the targeted area. This excess waste will have to be disposed of by the applicator. An over-application will result in not enough mixture to cover the targeted area. This may result in hazardous over-application in the sprayed areas and no coverage in the remaining areas. In order to spray the remaining areas, the procedure for figuring the amount of pesticide needed will have to be done again

for the remaining land area. Thus, after running out of chemical, an applicator will be forced to recalibrate using only the area measurement still needing to be sprayed. He will have to go through the mixing procedure again. Either under- or over-spraying will lead to more time and effort from the applicator.

Correct calibrations, on the other hand, will simplify the task, shorten the time required to spray the area and minimize, if not eliminate, any waste mixture.

### Cleanup

Select a location to spray rinse water when finished with your applications. Clean equipment thoroughly. Rinse water, even for this cleanup procedure, should not be applied over an area already sprayed. Reapplying over such an area could lead to contamination of the soil or water or even result

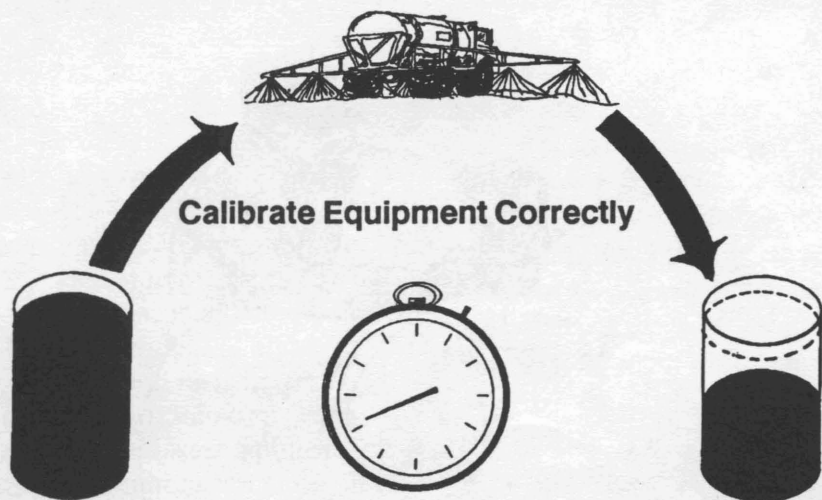
in longer persistence of the chemical in that area. It may also harm the crop which is being sprayed. Instead, rinse water should be applied to an area in which the spray would do some good in controlling the target pest, but would not create a contamination hazard. Consult the pesticide label for additional disposal instructions. If you have further questions, contact the Texas Department of Agriculture or the Texas Water Commission for advice. Remaining mixture and cleanup rinsate from equipment can thus be disposed of safely.

Keeping the excess mixture, on the other hand, could create problems. Many pesticides degrade more quickly once they are mixed with water or oil. This may weaken or even completely inactivate mixtures saved for later use. Also, the mixture in a tank is more subject to temperature and sunlight factors which can hasten

pesticide degradation. Extra mixture may also present spill or leaking hazards. If the extra mixture is not used or stored in a locked area, children, pets or livestock could come into contact with the pesticide. If the container holding the stored mixture is not checked daily, drips or leaks could contaminate the storage area.

When cleaning equipment or disposing of containers, triple rinsing of the equipment surfaces and of the empty containers is advised. Triple rinsing containers and putting the rinse water in the tank rinse will allow the applicator to dispose of the waste water by later applying the rinsate to areas where it would be useful. Then, equipment should be rinsed both inside and out so that pesticide residues on and in the equipment can be minimized. If equipment is rinsed at a loading pad, a closed storage system could be used to collect the rinsate. If a closed system is not available, however, storage tanks or containers may need to be used to catch the rinse water. If the waste material or rinsate is stored, keep records on the material placed in each storage tank and the date the waste was stored so that the tank will not be used for other, possibly incompatible, chemical wastes.

Never store assorted wastes in the same container. Fires, leaks and other releases could culminate if ignitable or reactive wastes are mixed. Mark storage containers so that others will know that hazard-



ous wastes are in the containers. Inspect all containers for leaks every week and, if possible, daily. Keep the containers closed except when you fill or empty them. Place the tank or container above ground, if possible, so that any leaks can be found immediately. Call your local fire department for any buffer zone requirements necessary for tanks containing ignitable or reactive wastes.

### Container Disposal

Specific requirements exist for large quantity and small quantity waste generators. Farmers, however, who dispose of waste pesticides from their own use are exempt. For farmers, containers should be triple rinsed with a solvent capable of removing any remaining content and the rinsate disposed of as consistent with the disposal instructions on the label. A farmer currently does not have to report this rinsate to the Texas Water Commission or to the U. S. Environmental Protection Agency. The empty containers, however, must be disposed of at a sanitary landfill or to the manufacturers or formulators after being properly emptied (triple rinsed with an appropriate solvent and punctured, crushed or otherwise rendered incapable of holding liquid).

### Summary

The key to minimizing waste is to correctly calibrate pesticide equipment and use only the amount of chemical needed. Correct disposal of containers is done by following label instructions for disposal and by following the laws and policies established in Texas through the Texas Water Commission, the Texas Department of Agriculture and the Texas Department of Health. All federal regulations in effect will also apply.

Applicators can reduce the time and trouble of managing waste by following five general guidelines:

1. Do not mix wastes. This increases the waste quantity stored and limits all recycling or land spreading. By not mixing waste chemicals, the rinsate can be used.
2. Look for ways to reduce the amount of products used.
3. Be aware of alternative products which might be less toxic or even nonhazardous.
4. Check on information about reuse and reclamation of waste products through the Texas Water Commission's RENEW program (Resource Exchange Network for Eliminating Waste).
5. Reuse rinsates from equipment and containers in a manner consistent with label instructions.

For information on the RENEW program, call the Texas Water Commission at (512)463-7761.

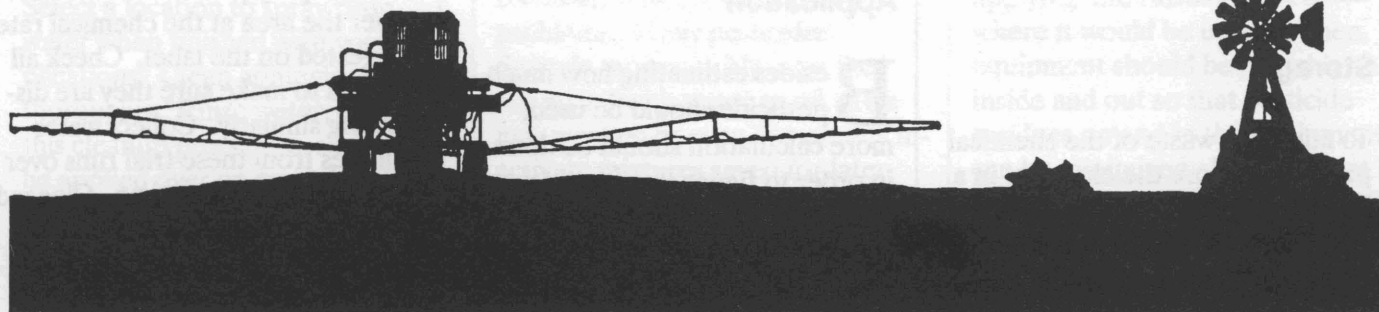


**Wear Protective Clothing**

Minimize the waste generated from pesticide use. Minimization helps protect soil, air and water resources. If you have further questions about pesticide waste disposal, contact your county agent or contact one of the environmental regulatory agencies in your area.

## References

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3. Texas Department of Agriculture. 1985. Hazardous Waste in Texas - Alternatives to Land Disposal.
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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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