



Proper Use, Storage and Handling of Pesticides, Herbicides, and Fertilizers

When handling potentially harmful materials such as fertilizers, herbicides and pesticides, use efficient and safe storage, and cleanup methods. Fertilizer management involves control of the rate, timing and method of application to minimize the chance of polluting surface water or groundwater. Pesticide and herbicide management involves eliminating excessive pesticide use, employment of proper application procedures, and the use of alternatives to chemical control to reduce the pesticide and herbicide load in stormwater runoff.

The use of fertilizers, herbicides and pesticides contribute to pollution of stormwater runoff. All types of properties contribute to the problem, residential, commercial, industrial, institutional. Users of these products should develop controls on the application of fertilizers, herbicides and pesticides.

Controls may include:

- Product and application information
- Equipment use and maintenance procedures
- Recordkeeping
- Public notice procedures

Selection of low-maintenance vegetation may reduce the need for fertilizers, pesticides and herbicides. Check with the University Extension Office (636-797-5391) concerning various alternatives.

Fertilizers

Avoid broadcast applications of fertilizers when immediate rainfall is expected. Apply fertilizer when there is already adequate soil moisture and little likelihood of immediate heavy rainfall, followed by sprinkling the lawn or garden. A soil test is recommended to assure the use of optimum lime and fertilizer application rates.

Whenever fertilizer is used to establish vegetation on bare soil areas, erosion control is of primary importance in preventing fertilizer from leaving the site.

Overuse of fertilizers can be detrimental to the intended use of an area. As an example, too much nitrogen will cause plants to produce shallow roots, a condition not good for heavily traveled areas.

Applying unnecessary amounts of fertilizer is not only a waste of money; it can also be detrimental to water quality. Excess fertilizers can wash into waterways, stimulating nuisance weed and algae growth. Excessive plant growth can choke slow-moving water, take up oxygen needed by fish and other aquatic life, and release ammonia which is toxic to fish. Before applying fertilizer, have the soil

tested to determine what nutrients must be added. Soil can be tested at the Missouri University Extension Center. Visit their website at extension.missouri.edu/Jefferson or call 636-797-5391.

Apply fertilizer at the proper time. Lawn fertilization programs should begin in early October, not early May. When applying fertilizers, follow the directions exactly and keep fertilizers off paved areas. If a liquid fertilizer is used, be careful to avoid over spray and drift. Sweep granular fertilizer back onto the grass to keep it from being washed into the storm water drainage system.

Herbicides and Pesticides

Excessive application and misuse of pesticides and herbicides results in heavily polluted stormwater runoff. Avoid broadcast applications of pesticides and herbicides when immediate rainfall is expected. Apply pesticides and herbicides in a narrow rather than wide band; do not broadcast them over the entire area. Spot-spray infested areas rather than applying excess amounts of pesticides and herbicides. Never apply over concrete, rock or other non-permeable surfaces. At the work place, consider a chemical free buffer strip in lawn areas that border any streams or ponds.

Examine all alternatives to pesticides and herbicides that, in the long term, may be much less costly than the use of a particular chemical. Use the least toxic chemical pesticide and herbicide that will accomplish the purpose.

Pesticides and herbicides that degrade rapidly are less likely to become stormwater runoff pollutants. Use pesticides and herbicides with low water solubility. Granular formulations are generally preferable to liquids because application losses are lower.

Pesticides and herbicides should be sprayed only when wind speeds are less than seven mph. Spray in the early morning or at dusk when wind speeds are usually lowest. Air temperature should range between 40 degrees to 80 degrees Fahrenheit.

Pesticide and Herbicide Types

- *Dusts*: This type is highly susceptible to wind drift, not only when being applied, but also after reaching target. The application should be performed during the early morning or late evening hours when there is little or no air movement. The distance between the application equipment and the target must also be considered.
- *Sprays*: this type may be in the form of solutions, emulsions, or suspensions. Droplet size is an important factor in determining susceptibility to wind drift. Large droplets fall faster and are less likely to contaminate non-target areas. Sprays should be applied during the periods of low air movement. Ground sprays followed by soil incorporation are not likely to be sources of water pollution unless excessive erosion occurs.
- *Granular formulations*: This type is applied to either the ground surface or below the soil surface. Surface applications may or may not be followed by soil incorporation. Pollution of surface waters from granular formulations is unlikely unless heavy runoff or erosion occurs soon after treatment. However, groundwater pollution may result from excessive leaching due to rainfall after application, depending on the pesticide composition. Loss of granular formulations can be controlled for the most part with adequate soil conservation practices.

- *Fumigants*: This type must be kept in place for specific lengths of time in order to be effective. Containment methods include soil compaction, water seal, and sealing of the area with a plastic cover. Most fumigants act rapidly and degrade quickly. Consequently, water pollution is usually not a problem.
- *Antimicrobial paints and other surface coatings*: This type is designed to resist weathering and is therefore not a likely source of pollution. Empty containers should be disposed in accordance with rules for all pesticide containers. Use extreme care when sanding or scraping surfaces that have been previously treated with these substances. Treat sanded and scraped residue as hazardous waste.

Goodhousekeeping and Safety

The Work Place -- Proper Maintenance Site - Mix and Load Area and Storage Facility:

Select an area that is spacious away from any body of water or stream, and where you can restrict entry of unauthorized persons. Design and build a non-pervious permanent concrete pad adjacent to the chemical storage shed for mixing and loading and a separate sealed concrete pad on which to wash equipment. Even small amounts of chemicals repeatedly dropped on the ground in the same location can build up over time and contaminate the soil, ground and surface water. Ideally, the work place should construct a shelter over both pads to protect employees from inclement weather and minimize the rainfall-based runoff from the pads. Install a chemical-resistant sump basin and pump to facilitate the collection of any spills, and design them to pump into a chemical holding unit.

The shed should include these options:

- Chemical-resistant shelving
 - Hands-free mix and load enclosed chamber
 - Automatic ventilation system
 - Hand and eye wash basin with a hookup to a potable water source
 - Sump system in the flooring
 - Special chemical-resistant interior lighting
 - Temperature control or insulation, depending on the climatic conditions
 - Visible signs written in English and Spanish on the exterior of the building that says, “NO SMOKING” and “WARNING PESTICIDE STORAGE”.
- Always use caution when handling any pesticide, herbicide, or fertilizer product. Many products contain toxic chemicals that can cause severe injury or death. It is critical to follow instructions for mixing and use exactly. Be concerned with cleanup and disposal at all times during the use process.
 - Always wear appropriate protective clothing. Never wash contaminated clothing with other clothing.
 - Take precautions to prevent spills. For example, close containers tightly after each use, even if you plan to reopen them soon.
 - Know what to do if a spill occurs.
 - Mix only the amount needed for the job.

- Follow the directions on the label exactly.
- Store pesticide or fertilizer products securely in containers protected from stormwater and away from children, pets, and sources of heat, sparks, and flames. Store products in their original containers and keep them well-labeled. Very importantly, do not store chemicals in food containers.
- Read and follow use instructions provided on packaging and in material safety data sheets. (MSDS). Periodically review MSDS information and discuss precautions with employees or personnel using or handling pesticides, herbicides, or fertilizers. Labels contain information about the persistence and toxicity of the chemical.
 - Avoid spraying over impervious surfaces.
 - Do not spray on a windy day.
 - Do not apply to bare or eroding soil.
 - Do not apply near water systems such as wells, streams, and lakes.
 - Reduce cleaning and waste by clustering jobs that use the same solution.

The words “natural,” “organic,” or “biodegradable” do not guarantee that it is safe. It is best to choose a “pest-specific” pesticide or herbicide that is designed to kill only the pest causing the damage. Persistence refers to the length of time it takes to break down to one-half its previous concentration. The half-life should be printed on the product label. Avoid pesticides with half-lives longer than 21 days.

- Work only in well-ventilated areas. Avoid contact with eyes and skin. Wear gloves and eye protection when using or handling hazardous substances. Do not wear contact lenses, which can absorb hazardous vapors. At the work place, only certified applicators should use pesticides and herbicides.
- Use the entire product before disposing the container.

Pesticide and Herbicide Storage

Keep pesticides and herbicides in their original containers so you know what they are and how to use them. Mark the date of purchase on each container and use older materials first. If possible, store pesticides and herbicides indoors in a clearly marked area, designed as secondary containment. Storage areas should be located at least 150 feet from any drinking water well and at least 200 feet from any area that holds water, even intermittently, such as a drainage ditch or dry retention pond.

Keep similar chemicals together. If you keep herbicides with herbicides and fungicides with fungicides, an employee who is conducting the application will be less likely to make a mistake in mixing the wrong ones together. Also, you should store flammable chemicals in a separate area.

Cleaning and Disposing of Empty Pesticide and Herbicide Containers

The best methods for cleaning containers and equipment are to triple rinse or pressure rinse in the field. To triple rinse: allow the concentrate to drain from the empty pesticide container for 30 seconds. Fill one-quarter of the container, replace the lid, and shake the container so that all interior

surfaces are rinsed. Drain the rinse water into the spray tank for at least 30 seconds. Repeat the process twice for a total of three rinses.

Rinse water must be collected and applied to a compatible site at or below the labeled rate. Empty pesticide and herbicide containers cannot be refilled, reconditioned, recycled, or sent back to the manufacturer. They must be crushed, broken, or punctured so that they cannot be used again. However, small containers that are used in the home can be disposed of in the trash pickup after they have been rendered unusable and then wrapped in plastic. Do not dispose of pesticide or fertilizer wastes in any of the following methods:

- Into trash or waste containers unless unusable and wrapped in plastic
- Into storm drains or into creeks
- Onto the ground
- By burning

Employee Training and Handling Procedures

Put the company training program in writing and hand it out to each employee working in the facility. Make a copy available at a central location at the workplace. Include information such as study guides; pesticide produce labeling; Safety Information Series (SIS) leaflets and MSDS; slides and videos if necessary and any other information that you provide in the training course, including the name of the person or firm providing the training. Employee training should cover pertinent information for each chemical and should include:

- Learning to read and understand the product labels and directions (labels are a legal document)
- Chemical hazards including signs and symptoms of acute exposure
- Common ways that pesticides can enter or be absorbed into the body
- Emergency aid procedures
- Safety procedures including proper handling techniques



References:

Knoxville, Tennessee BMP Manual, January 2001, AM 13.

OSEH Stormwater Management Practices

Website: www.oseh.umich.edu/environment/pesticidesandfertilizers.shtml

Website: http://grounds-mag.com/mag/grounds_maintenance_chemicals_safe_mixing/