



# Responsible Use of Lawn Care Pesticides

Properly maintained and healthy turfgrass tolerates the presence of low levels of pest populations without suffering permanent damage. Healthy turfgrass usually recovers more quickly from any insect or disease infestations. However, there may be times, even in healthy lawns, when some pest control may be needed to prevent significant turf damage. Correct and judicious use of pesticides, chemical or biological, can be used to reduce pest populations and allow turfgrass recovery.

Pesticides are subject to a number of different fates once they are applied to a turfgrass area. Some of them may be degraded by sunlight, microbial action, chemical action, or a combination of

these processes. Others may volatilize back to the atmosphere, be absorbed by the plants, or adsorbed by soil particles limiting further soil movement. Pesticides may be subject to several of these different processes but some may be more important than others. Degradation processes and plant absorption are particularly important as they account for removal of the pesticide from the environment. Two environmental concerns to surface water quality are those associated with leaching and runoff. For a more complete discussion concerning potential leaching and runoff from turf areas, see *Turfgrass Management Practices for Protecting Surface Water Quality*, AG-BU-5726-E.

## Leaching

Leaching is the downward movement of pesticides and nutrients with water flow through the soil. It is the process responsible for carrying pesticide and nutrient contaminants to groundwater and possibly surface water.

Unlike pesticide application to bare soil, the turfgrass system with its high plant density, dense fibrous root zone and thatch development can have a significant effect on pesticide leaching potential. Recent university studies have demonstrated that the grass and thatch are a barrier to movement of several of the commonly available turfgrass insecticides and herbicides. Other research has suggested that the turf root zone area is biologically active and can facilitate the microbial breakdown of some pesticides. Thus, long-term build-up of these materials in the turf root zone is unlikely. While the scientific data regarding the potential leaching of pesticides is limited, the turfgrass system does appear to restrict downward movement of pesticides applied to turf.

## **Runoff**

Runoff occurs when the precipitation rate exceeds the rate of water infiltration into the soil. This can be a significant potential loss of pesticides and nutrients from row crop agriculture, where the pesticides are often applied to bare soil and may not be held in place by plants. When runoff occurs from these areas, pesticides can be dissolved and carried in runoff water. Pesticides also can be carried along as sediment in runoff water if they are bound tightly to soil particles.

Recent university studies have demonstrated that runoff from dense turf areas can be reduced to insignificant levels. Turfgrass areas have a tremendous potential to absorb large amounts of precipitation. For example, it has been reported that a 150-acre golf course has the capacity to absorb 12 million gallons of water during a heavy (3-inch) rain-storm. Water movement over a dense turfgrass stand is usually slow enough that most of the water will infiltrate into the turf area before it can run off. Research has indicated that herbicides were either non-existent or at very low levels when runoff was sampled from turf areas.

While research from turfed areas is limited, the initial findings suggest that turfgrass can significantly limit runoff, thereby reducing the chances for off-site movement of nutrients and pesticides.

## **Responsible pesticide application**

The first step in responsibly using any pesticide product is to follow the label directions exactly as stated on the product container. The label provides necessary information regarding proper product application and container disposal procedures. Labels are legal documents and are enforceable by law should the product be used in a manner inconsistent with directions.

Before applying insecticides and fungicides to a turf area, be sure that the apparent damage symptoms are being caused by an insect or disease. If an insect or disease pest is found to be causing serious turf damage, then a proper control method can be selected. This may or may not involve the use of a pesticide.

Weeds should be identified to determine whether there is a need for a pesticide. They may only indicate whether other cultural conditions need to be corrected. As with fertilizers, it should be obvious that extreme care must be taken to prevent the direct application of pesticides into surface water.

Properly timing pesticide applications is crucial to their overall effectiveness against the pest and to minimize adverse environmental impacts. Often minimal amounts of pesticide can be used when the pest is in a young and/or highly vulnerable stage. When weeds or insects are quite large and mature, greater amounts of pesticides are usually needed and may not be that effective. Likewise, treating disease problems at early stages of infection is more prudent and may require less fungicide than attempting treatment of large, heavily infected areas.

Proper timing relates to the time of year when a pesticide may be most effective. Fall is the best time to control perennial broadleaf weeds. At this time of year (mid-September to early October), these plants are actively growing and readily take up the herbicide. Often, lower rates and only one application of an appropriate herbicide are needed to be effective. As much of the other landscape plant material is either going dormant for the winter or has been removed from garden and flower beds, there is usually less chance for off-target plant injury. How-

ever, that does not give license to be careless when applying a pesticide product.

Sometimes it is necessary to water-in a pesticide treatment for it to be most effective. Pre-emergent types of herbicides typically used for controlling crabgrass and other annual weedy plants must be moved into the soil surface. Their mode of action is such that it affects the seed as it begins to germinate but before it emerges from the ground. Depending on the soil type, 1/4 to 1/2 inch of moisture should be applied following application of these products. (This is about one to two hours of irrigation with most common lawn sprinklers. Automatic irrigation systems may need to be adjusted accordingly.) The moisture not only puts the product where it will be the most effective but may move the material far enough into the soil that it will not be carried away in runoff.

A similar situation exists with insecticides and fungicides. Those materials used for controlling thatch and soil-inhabiting insects and diseases usually require some type of irrigation following application to move the product into the thatch and thatch/soil area. This puts the product where it will be the most effective, reduces the chances of runoff, and potentially reduces exposure to the material. While thatch can facilitate the breakdown of these materials and potentially reduce their effectiveness, it can also shorten pesticides' persistence in the environment. Pesticide label directions indicate whether or not post-application irrigation is needed.

In the case of herbicides, it is often unnecessary to thoroughly drench an area to achieve satisfactory weed control. This may waste both water and herbicide as well as moving the herbicide beyond the plants and into the soil where it may be

more prone to leaching. Where plant cover is sparse, the herbicide could potentially be carried in runoff either directly or bound to sediment. Spraying just to wet the foliage without causing runoff is usually sufficient to move enough herbicide into the plant to be effective. Again, follow label directions for proper mixing and water volume to use with the product.

Protecting our surface water as well as groundwater is not something to be taken lightly. However, neglecting our turf areas for fear of introducing nutrients and pesticides into our water supplies is not a way to protect these resources. Evidence is beginning to build that properly maintaining turfed areas with appropriate but modest use of fertilizers and pesticides may do more to protect our water resources than to hurt them.

For additional information regarding the responsible use of lawn fertilizers and pesticides to protect surface water quality, see the following publications, available at county extension offices.

*Turfgrass Management Practices for Protecting Surface Water Quality,*  
AG-BU-5726-E

*Lawn Care Practices to Reduce the Need for Fertilizers and Pesticides,*  
AG-FO-5890-B

*Using Lawn Fertilizers and Pesticides Responsibly,*  
AG-FO-5889-B

*Phosphorus Management Practices for Lawns,* AG-FO-5892-B

*Nitrogen Fertilizer Use for Lawns,*  
AG-FO-5893-B



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