DON'T BAG IT - REDUCE CLIPPING REMOVAL

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Grass clippings comprise a significant portion of the solid waste taken to waste disposal sites. Estimates suggest that 20% or more of the total volume of residential waste comes from grass clippings. A number of states and municipalities have already developed regulations making it illegal to place clippings and other yard wastes in land fills. Others will surely follow with regulations of their own. It behooves the turf industry to better understand how to reduce the amount of yard waste and the benefits of returning clippings to the turf.

REDUCING YARD WASTES

There are several means of reducing yard wastes. Perhaps the most visible is simply to return the clippings to the turf. This can be done without detriment to the turf if practiced properly. Several factors related to mowing management will be discussed later. One can use grass clippings to mulch around trees or shrubs, and on vegetable or flower gardens. Of course, this should not be done for a few mowings after applying an herbicide to the turf which might contain residual material that could have a detrimental effect on sensitive plants like tomatoes. Any potential problem would come as a result of placing all the clippings in one place which could give a concentration of herbicide sufficient enough to affect the plants in the garden. There has been very little research on the amount of residual chemical left in the clippings after one or more mowings. This could be a very fruitful area of research. One other potential use of clippings is to compost them. This can be done on-site or off-site. If composting is to be done on-site, there are bulletins available from the Cooperative Extension Service and other sources which describe proper composting techniques. Several municipalities and private venture operations are now beginning to provide composting services to home owners and others wishing to dispose of their clippings off-site.

One other significant means of reducing yard waste is to utilize trees leaves on-site in the fall. Tree leaves can also be composted or used effectively as a mulch on garden areas. Another alternative for leaves is to use a mower to grind them into small enough pieces so they fall into the turf. Although we don't know much about the impact of this practice on turf from a scientific perspective, this has been done for years on many lawns and other sites with no apparent detriment to the turf. The key is to mow frequently during the time when leaves fall on the turf and to mow when the leaves are dry so the mower can break them into small pieces. Rotary mowers work best for this purpose. Be sure the mower blade is sharp so the leaves can be cut into small pieces. It may be wise to apply some extra nitrogen soon after mowing the tree leaves to aid in the decomposition of the leaves before next spring. Use a nitrogen fertilizer which contains mostly soluble N so it can be used quickly by microorganisms which attack the leaf material. This nitrogen will surely be tied up in the leaf material until next spring so the potential for leaching of nitrates should be minimal. Although we have no research data, the application of about one-half

pound N per 1000 sq. ft. more than normally applied at that time of year should be adequate for moderate leaf rates. If very heavy leaf fall occurs, this could be raised to 1 pound N per 1000 sq. ft. Experience from one year will be helpful in determining the proper amount of N needed the next year.

There are several advantages which can be suggested for returning clippings to the turf. First, is that by returning clippings there is a recycling of the nutrients in the clippings. Nitrogen is the most important, of course, since turf clippings range from as low as about 2.5% to about 5% N depending on fertilization schedule and growth rate of the grass. In a cooperative study with James Beard conducted several years ago on Kentucky bluegrass, we observed that it required from 20-40% less N annually when clippings were returned to attain the same overall quality turf quality as when clippings were removed. Other nutrients are also important, of course. On our research plots we have been able to induce deficiencies of both phosphorus and potassium by continuously removing clippings while not applying either of these in the fertilizer. It is possible that deficiencies of other nutrients could be induced as well where clippings are removed and some program for replacing them is not followed. This would seem especially likely on sands which have naturally low levels of most nutrients.

Returning the clippings returns organic matter to the soil which may attract earthworms and other biological activity. It disperses nutrients in the clippings back to the environment from which they came rather than concentrating them in one place as is done in a land fill. Since grass clippings are 80-90% water they generally dry quickly and fall into the turf rather than contributing to the weight hauled to the land fill. There does not appear to be much effect of returning clippings to the turf in terms of susceptibility to disease. An exception would be stripe smut. If a turf has been infected with stripe smut, removal of clippings is recommended to reduce the inoculum of this disease in the turf. For other turf diseases this does not appear to be a problem.
Managing the turf to reduce the amount of clippings is another alternative which should be considered by home owners and turf managers. This can be accomplished by: 1) reducing the amount of nitrogen applied annually; 2) applying nitrogen at times which will not encourage high growth rates; 3) provide irrigation at modest rates so as not to encourage rapid growth; 4) using plant growth regulators judiciously: and 5) planting lower nitrogen-requiring grasses.

Nitrogen fertilization is a significant factor in turf growth rate and the amount of clippings generated. Higher nitrogen rates obviously increase growth rate. Another very important factor is timing of nitrogen application. Since cool season turfgrasses tend to have maximum growth rates in the spring, any nitrogen applied at that time of year causes even greater growth. When warm, rainy weather prevails growth is often so fast it is nearly impossible to mow at proper intervals. For this reason, nitrogen fertilization programs which reduce the amount of N applied in the spring help to reduce growth and clippings generated. Another practical alternative is for homeowners to apply fertilizers at 1/2 the normal rate of application, but apply that more often. This would reduce the high growth response more commonly observed with 1 pound N applications, especially during wet, warm weather. Using lower annual N rates and reducing N in the spring will be effective in reducing growth, but may result in somewhat lower turf quality. But with proper timing, good quality turf can still be achieved.

MOWING FACTORS

For effective return of clippings it is necessary to cut the clippings into small enough pieces so they will fall into the turf and not bridge or collect in clumps. To achieve this there are several things to consider. First, be sure the mower blades are sharp. For intensively used mowers, this may mean sharpening the blade daily. For the average home owner sharpening the blade 2 to 3 times annually will be adequate. If mowing is done when the turf is dry, much better cutting is achieved. If clippings tend to clump up on the turf, one can run the mower back over those areas or use a hand rake to disperse the clippings. Use of a mulching mower will give smaller clippings, although the mowing operation might be a little slower. Check out new mower purchases to be sure the specific model does a good job of dispersing clippings from the mower. Many companies which sell bagging mowers also offer attachments which can be placed on the mower to return the clippings safely. Safe mower handling should always be a high priority. This includes disconnecting the spark plug wire when removing the mower blade to have it sharpened. Always handle the mower blade carefully, preferably while wearing gloves.

Perhaps the most important factor in evaluating mowing practices is mowing height and frequency. Mowing should be done at a frequency that results in removal of no more than 1/3 of the top growth. This means the shorter the turf is mowed the more frequently it must be mowed as shown in the Table 1. If a turf can only be mowed infrequently, as on a weekly basis, it is best to set the mower to a higher height. When the turf is mowed at a higher height, the turf density is unusually somewhat lower which permits easier penetration of the clippings into the turf. Clumping of clippings can still occur when turf is mowed at a higher height, however, if the clippings are longer as suggested is acceptable in Table 1.

Table 1. MOWING HEIGHT AND FREQUENCY

	Inches				
Mower set to mow at	1.0	1.5	2.0	2.5	3.0
Mow when the turf reaches	1.5	2.3	3.0	3.8	4.5
Growth removed	0.5	0.8	1.0	1.3	1.5

Contrary to somewhat common opinion, clippings do not contribute to thatch accumulation. Grass blades break down quickly in the turf. Thatch is composed primarily of living and dead stems and roots.
The dead components are quite resistant to microbial degradation, accumulating between the soil and the growing point (crown) of the grass. Clippings may be returned to turf with no effect on thatch.

Returning clippings necessitates more frequent mowing so the leaf blades can fall back into the turf. While more frequent mowing is not very popular with home owners or turf professionals, it is interesting to consider the data from a study done in Ft. Worth, TX by William Knoop. He found that when home owners returned their clippings they mowed an average of 5.4 times per month while those who

collected clippings, placing them in bags to be taken to a land fill, mowed an average 4.1 times per month. In spite of that difference in the number of mowings, those who returned clippings actually spent 38% less time per month mowing their lawns than the baggers, who had to spend the extra time bagging and handling the bags.

For most turfgrasses used in Michigan, one can mow as high as 3 inches while still maintaining adequate turf quality. This is true for Kentucky bluegrasses, perennial ryegrasses and fine fescues. Tall fescue can be mowed at 3 inches or possibly a little higher. Mowing at this height will result in a slightly lower turf density and turf quality (appearance), but the difference is small. And mowing at the higher height starting right away in the spring may encourage deeper rooting of the grass which could help the grass be more tolerant of moisture stress during the summer.