Reusing clippings to improve turfgrass health and performance

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Many states have passed waste diversion acts. California's Integrated Waste Management Act, enacted from Assembly Bill 939 legislation, mandates a 50 percent diversion of landfill wastes that each county and city generates by the end of the year 2000, based on 1990 levels. If such legislation has not yet hit your state, be assured it likely will be under consideration soon.

Grasscycling, composting and mulching offer valuable alternatives to depositing grass clippings in landfills, and promote the growth of healthy landscape plants. Studies indicate that an average California lawn generates 300 to 400 pounds of grass clippings per 1,000 square feet annually, which equates to as much as eight tons per acre each year.

Grass clippings historically have comprised half of the yard trimmings deposited in California landfills, and yard trimmings make up the largest single component of California's municipal waste. The situation is likely to be similar elsewhere.

Grasscycling

In grasscycling, clippings are simply left on the turf area as it is mowed to decompose, rather than bagged.

Grasscycling is an excellent method of recycling a valuable organic resource in lawns and large public and commercial turfgrass plantings such as parks, cemeteries, school grounds and portions of golf courses.

In situations where prolonged wet weather, mechanical breakdown of mowers, or infrequent mowing result in large amounts of clippings, the cut turfgrass should be bagged and composted or dried for use as mulch. Besides diverting organic matter from landfills, grasscycling supplies valuable organic material and nutrients to the soil.

Grass clippings decompose quickly. They typically contain about four percent nitrogen, 0.5 percent phosphorus, and two percent potassium, which reduce fertilizer requirements by approximately 20 percent. Grasscycling also reduces mowing time and disposal costs.

TABLE 1:

RECOMMENDED TURFGRASS MOWING HEIGHTS

Turfgrass Type	Mower Setting (inches)	Mow When Grass Reaches This Height(inches)
Bermudagrass (common)	1 to 1-1/2	1-1/2 to 2-1/4
Bermudagrass (hybrid)	1/2 to 1 inch	3/4 to 1-1/2
Buffalograss	1 to 2	1-1/2 to 3
Kentucky Bluegrass	1-1/2 to 2-1/2	2-1/4 to 3-3/4
Kikuyugrass	1 to 1-1/2	1-1/2 to 2-1/4
Perennial Ryegrass	1-1/2 to 2-1/2	2-1/4 to 3-3/4
St. Augustinegrass	1 to 2	1-1/2 to 3
Tall Fescue	1-1/2 to 3	2-1/4 to 4-1/2
Zoysiagrass	1/2 to 1-1/2	3/4 to 2-1/4

Golf course putting greens, sod farms, and major league sports fields are not as adapted to grasscycling due to their requirements for exceptionally uniform playing surfaces.

Mowing basics

It is often usually necessary to mow at least weekly during the active growing season when grasscycling to avoid a build-up of excess clippings. Turfgrass that is not cut frequently enough when grasscycling may produce a "hay-like" look that can be unsightly. Maintaining turfgrass at the recommended mowing height is also important. Follow the 1/3 rule; mow often enough so that no more than one-third of the length of the grass blade needs to be removed during any single mowing. This allows short clippings to work their way through the canopy to decompose, without covering the surface.

It is important to use sharp mower blades and mow when the surface is dry. Table 1 lists recommended mowing heights for several species of turfgrass. Studies have shown that there are benefits to maintaining a relatively high mowing height to encourage the development of deeper roots, which can improve drought resistance and reduce stress. (See Table 1)

Options for mowing

Many types of mowers adapt to grasscycling. Mowers with a safety flap covering the opening where the bag fits into the chute offer the option of simply removing the bag. Mowers without a flap, or a plug for the chute, may be adapted to retrofitting. Contact a reputable dealer to inquire about the availability of purchasing a retrofit kit.

Major lawnmower manufacturers now offer mulching or recycling mowers which cut grass blades into small pieces before reapplying them to the turfgrass. Horsepower rating is very important when purchasing a mulching mower; a model supplying at least 4 or 5-hp is recommended. Convertible mulching mowers should have blades that can conveniently be changed. Otherwise, they may end up being used for only one purpose, defeating its intended dual use. Studies indicate that seasonal mowing time can be reduced by 50 percent or more when mulching or recycling mowers are used compared to conventional bagging and disposal operations. Additionally, the potential for back strains and injuries is reduced, which can equate to significant savings on health care costs and workers compensation.

In some cases, grasscycling is not appropriate. Examples are instances when the grass is too wet or when it has not been regularly mowed and is too tall. Options such as composting and mulching are viable alternatives to grasscycling in these cases.

Role of thatch

Thatch is comprised of lignin-containing roots, stems, rhizomes, crowns and stolons, and decomposes relatively slowly.

Since turfgrass clippings are approximately 80 percent water and contain only small amounts of lignin, they decompose rapidly. Research conducted in California indicates that grasscycling only slightly increases the amount of thatch buildup, and the benefits outweigh the disadvantages in most situations.

Bermudagrass, Kentucky bluegrass and kikuyugrass produce more thatch than most other turfgrasses, and require regular dethatching whether the site is grasscycled or not. A one-half inch layer of thatch provides insulation to roots, reduces soil water evaporation, cushions playing surfaces, and may prevent soil compaction.

Fertilization

Proper fertilization is important to insure healthy, safe turfgrass sites. Over-fertilization should be avoided to prevent excessive shoot growth and weak turfgrass, and the need for frequent mowing.

For moderate, even growth, a combination of fast acting fertilizers (ammonium nitrate, ammonium sulfate, or urea) and slow release nitrogen sources (sulfur-coated urea, urea formaldehyde, IBDU and organic materials) should be used.

While turfgrasses differ in their fertility requirements, it is usually better for the grass and the environment to apply smaller quantities of fertilizer more frequently, concentrating on the active growing season, rather than applying larger amounts less often.

Grasscycling supplies about 20 percent of the fertilizer requirements of most turfgrasses.

Irrigation's impact

Correctly irrigating is always a high priority when maintaining turfgrass plantings, but is particularly important when grasscycling. Applying too much water is wasteful and can increase growth, requiring more frequent mowing. Not applying enough water may lead to unhealthy, slow-growing grass vulnerable to disease and insect pests. In general, deep irrigation leads to deep root systems, which increases drought resistance and reduces stress.

Turfgrasses vary in their need for water. Warm-season turfgrasses (Bermudagrass, zoysiagrass, buffalograss, and St. Augustinegrass) are more drought resistant than cool-season turfgrasses (tall fescue, bluegrass, annual and perennial ryegrass) and require about 20 percent less water.

There is an increasing amount of literature that demonstrates the ability of thatch to retain or retard the movement of most pesticides.

Irrigating according to a local weather station network using ETo (reference evapotranspiration) can be a highly effective method of reducing water waste and improving turfgrass health and performance Irrigating until runoff just begins is the preferred length of an individual irrigation. In cases where soil has a slow infiltration rate or the irrigation precipitation rate is high, water cycling is necessary. To accomplish cycling effectively, irrigate until runoff just begins, turn the system off, and repeat the process in 10 or 15 minutes before the soil surface dries out.

To determine the precipitation rate, conduct 'can tests' by setting out small, empty straight-sided containers every 10 to 15 feet between sprinkler heads irrigated by the same valve, and run the system for 15 minutes. There are a wide array of cans that work well for this purpose, including clean empty tuna and cat food cans. (If cups or other non-straight sided cans are used, volumetric measurements need to be taken, which increases the amount of time required for this task.)

Measure the amount of water in each can with a ruler, and determine the average amount of water per can. Multiply this average by four to determine the precipitation rate per hour. Conducting 'can tests' regularly is useful for determining how evenly irrigation water is distributed over the area (distribution uniformity), allowing sprinkler head misalignments and other mechanical problems to be corrected. The best time to irrigate is early in the morning, because less water is lost to evaporation, and water pressure is at its peak. Irrigating in the afternoon is wasteful due to high evaporation rates, and prolonged damp conditions in the evening may encourage disease development.

Benefit to composting

Turfgrass clippings are an excellent addition to a compost pile. Since grass clippings contain higher levels of nitrogen than other organic landscape materials contain, they help balance the carbon to nitrogen (C:N) ratio. While tree leaves alone will decompose, leaves mixed with turfgrass clippings decompose faster and more completely.

Because turfgrass clippings are small and herbaceous, they will decompose readily and can be added 'as is' to a compost pile without further chopping or cutting. Grass clippings should not be composted alone; unfavorable conditions resulting from low levels of oxygen will develop. Large amounts of wet clippings should be dried before they are added to a compost pile.

There are numerous physical benefits derived from amending planting beds for annuals and perennials with compost, as long as the material is well decomposed and is mixed evenly and deeply into the soil. Studies show that established lawns may benefit from a shallow (less than 1/2 inch) layer of compost topdressing, applied four times

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a year. In addition to nutritional benefits, a light compost topdressing can improve soil microbial activity, aiding in soil aeration and overall health of the turfgrass planting.

Mulching methods

Dried turfgrass clippings applied as a mulch aid in weed control and prevent moisture loss in ornamental planting beds. While a three to four inch layer of mulch is necessary to reduce weed infestations, adding too much mulch prevents oxygen movement into the soil.

Mulches used around tree trunks should not come in contact with the trunk. Mulching with Bermudagrass clippings should be avoided due to its invasiveness, as should mulching with clippings receiving recent or regular herbicide applications. Turfgrass clippings should be thoroughly leached before being dried and used as mulch if questions exist pertaining to any chemicals that may have been applied.

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Letter to the Editor

DEAR EDITOR,

I subscribe to TurfGrass Trends *to try to stay current with the "state-of-the-art" in a variety of areas that influence turfgrass management practices. When I read the articles and commentaries by your scientific experts, I ascribe a high degree of credibility to their accuracy because I assume they are experts in their fields.*

I was shocked and disappointed, therefore, when I read Dr. Richard Hull's response to the question, "How efficient is foliar feeding?" in the July 2000 issue of TurfGrass Trends. *Not only is it neither clear nor accurate but it also ignores the current state-of-the-art in foliar technology. That's unfortunate.*

It's unfortunate for us because we manufacture true foliar fertilizers and micronutrients and it's "our ox that's being gored." It's unfortunate for you because it doesn't advance your reputation as a publication on the "cutting edge" of turfgrass technology and science. And it's unfortunate for those readers who are field practitioners and who might benefit from the appropriate use of true foliar materials but won't because of the impression created by Dr. Hull's answer to this question.

I would appreciate it if you would make some good faith attempt to present a more clear, accurate and balanced answer to the question "How efficient is foliar feeding?" in some future issues.

As a suggestion, it would be helpful to begin by defining what a true foliar fertilizer is. Liquids, water solubles and foliars are distinctly different. Most liquids and almost all water solubles are not foliars at all; they are designed for root uptake. They contain the same large macro molecules that granulars do but deliver them in a liquid or water soluble form.

True foliars are not designed for root uptake (although they can be taken-up by the roots). Rather, they are formulated to penetrate the leaf cuticle and be absorbed directly into the foliage of the plant. So while it is true that all foliars are liquids, it is not true that all liquids are foliars.

What defines a true foliar fertilizer is the size of the molecules. The size of the micropores in the surface of the leaf determines the size of the molecules that can penetrate the leaf. If the fertilizer molecules are too big, they can't penetrate. It's