Reusing Turfgrass Clippings to Improve Turfgrass Health and Performance in Southern California

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This publication is one of a series developed by the California Integrated Waste Management Board (CIWMB) under an interagency agreement with the Regents of the University of California/Department of Agricultural and Natural Resources. Prepared under contract number IWM-C8085 ($20,000).

REUSING TURFGRASS CLIPPINGS TO IMPROVE TURFGRASS HEALTH AND PERFORMANCE IN SOUTHERN CALIFORNIA

Introduction

The California Integrated Waste Management Act (AB 939, Sher, Chapter 1095, Statutes of 1989) mandates a 50 percent diversion of landfill wastes that each county and city generates, based on 1990 levels. 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.

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 4 percent nitrogen, 0.5 percent phosphorus, and 2 percent potassium, which reduce fertilizer requirements by approximately 20 percent. Grasscycling also reduces mowing time and disposal costs.

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.

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

Mowing

When grasscycling, it is usually necessary to mow at least weekly during the active growing season to avoid a build-up of excess clippings. Turfgrass that is not cut frequently enough when grasscycling may produce a "hay-like" look which 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 1/3 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*** indicates 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 reduces stress.

Mower Options

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 offer mulching or recycling mowers which cut grass blades into small pieces before reapplying them to the turfgrass. Horsepower rating is very important when shopping for a mulching mower; a model supplying at least 4 or 5 horsepower 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 their 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 result in 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.

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 1/2-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 fertilizer 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

Proper irrigation 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, kikuyugrass 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.

TABLE 2. Minutes to Irrigate Warm- and Cool-Season Turfgrasses per Week in Southern California

SOUTHERN CALIFORNIA COAST

Warm-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	44	22	15	11
FEB	57	28	19	14
MAR	63	32	21	16
APR	76	38	25	19
MAY	88	44	29	22
JUN	95	47	32	24
JUL	107	54	36	27
AUG	95	47	33	24
SEP	82	41	27	20
OCT	69	35	23	17
NOV	50	25	17	13
DEC	38	19	13	9

Cool-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	59	29	20	15
FEB	76	38	25	19
MAR	84	42	28	21
APR	101	50	34	25
MAY	118	59	39	29
JUN	126	63	42	32
JUL	143	71	48	36
AUG	126	63	42	32
SEP	109	55	36	27
OCT	92	46	31	23
NOV	67	34	22	17
DEC	50	25	17	13

SOUTHERN CALIFORNIA INLAND VALLEYS

Warm-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	42	21	14	10
FEB	57	28	19	14
MAR	80	40	27	20
APR	96	48	32	24
MAY	119	60	40	29
JUN	144	72	48	36
JUL	165	83	55	41
AUG	155	77	52	39
SEP	124	62	41	31
OCT	88	44	29	22
NOV	54	27	18	14
DEC	42	21	14	10

Cool-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	56	28	19	14
FEB	75	38	25	19
MAR	106	53	35	27
APR	128	64	43	32
MAY	159	80	53	40
JUN	193	96	64	48
JUL	221	110	74	55
AUG	207	103	69	52
SEP	165	82	55	41
OCT	117	59	39	29
NOV	73	36	24	18
DEC	55	28	19	14

SOUTHERN CALIFORNIA DESERTS

Warm-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	54	27	18	14
FEB	75	38	25	19
MAR	121	61	40	30
APR	165	83	55	41
MAY	211	106	70	53
JUN	243	121	81	61
JUL	251	126	84	63
AUG	218	109	73	54
SEP	180	90	60	45
OCT	121	61	40	30
NOV	69	35	23	17
DEC	43	22	14	11

Cool-Season Turfgrasses

	Minutes to irrigate/week if hourly sprinkler output is:			
	0.5 in	1.0 in	1.5 in	2.0 in
JAN	65	32	22	17
FEB	90	46	30	23
MAR	145	73	48	36
APR	198	100	66	49
MAY	253	127	84	64
JUN	292	145	97	73
JUL	301	151	101	76
AUG	262	131	88	65
SEP	216	108	72	54
OCT	145	73	48	36
NOV	83	42	28	20
DEC	52	26	17	13

Table 2 indicates how many minutes to irrigate warm- and cool-season turfgrasses each week, based on the precipitation rate of the irrigation system. If runoff or brown spots occur with one weekly irrigation, the weekly total should be divided by two, three, or four, to water two, three, or four times a week for fewer minutes. 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, irrigation cycling is necessary. To accomplish cycling effectively, irrigate until runoff just begins, turn the system off, and repeat the process in ten or fifteen minutes before the soil surface dries out. Repeat if necessary.

To determine the precipitation rate, conduct "can tests" by setting out small, empty, straight-sided containers every ten to fifteen feet between sprinkler heads operated 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 catfood 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), so that sprinkler head misalignments and other mechanical problems can 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.

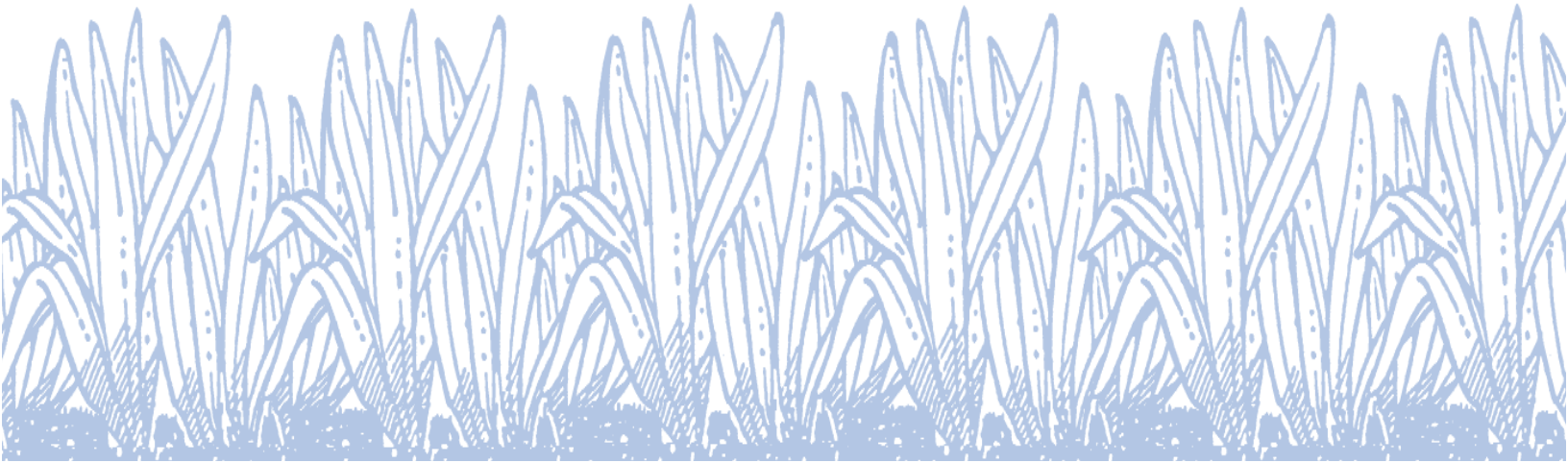
Composting

Turfgrass clippings are an excellent addition to a compost pile. Since grass clippings contain higher levels of nitrogen than other organic landscape materials, 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. Established turf sites may benefit from a shallow (not more than 1/2 inch) layer of compost topdressing, applied four times 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

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. If questions exist pertaining to any chemicals that may have been applied, turfgrass clippings should be thoroughly leached before being dried and used as mulch.



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Additional Resources

The California Integrated Waste Management Board's "Commercial Landscaping" Web site (www.ciwmb.ca.gov/Organics/Landscaping/) contains helpful information and a listing of publications for online ordering or downloading on using landscape management practices that reduce waste generation, reuse trimmings on site, and recycle organic products (mulch and compost) back into urban landscapes while also saving time and money.

CIWMB Publication #443-01-023 Revised June 2001

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