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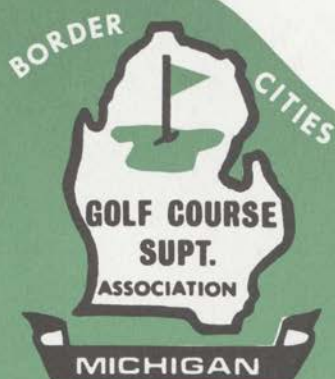
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HOW TO CURE THE CAUSE OF SOIL COMPACTION

Soil supports plant life. To support healthy plants, it must be of good "tilth", containing the correct mixture of sand, silt, and clay particles, plus the correct arrangement of these particles for good structure. Soils of good type and structure must be maintained in top condition by proper feeding, and an adequate supply of water and air are needed.

Grass plants must be supported by deep, well-developed root systems to remain healthy and resist wear, and these develop only in soils of good structure. But soils deteriorate and become poor and compacted through use and misuse. When compaction occurs, air and water movement is restricted, fertilizers cannot penetrate into the soil, and roots struggle for survival at the soil's surface. The top-growth gradually weakens; the plant becomes subject to disease. It is unable to survive periods of drought or excessive heat. It cannot stand the constant pounding of human feet and the wear and tear of maintenance machinery. Maintaining any kind of grass cover under these conditions becomes difficult and expensive.

What is soil compaction? Soil of good structure is comprised of a variety of particle sizes, with many spaces between these particles. These are called "pore spaces." The existence of these pore spaces is a key factor; roots do not grow in the soil, they grow in these "pore spaces" between the soil particles. Water, air and food travel through the soil by way of these spaces. When soil particles are pressed together into plate-like particles, the number and size of the pore spaces is reduced and the "passageways" are sealed to the movement of vital materials. Then the soil is "compacted." Compaction indicates its presence in many ways - shallow root systems, the presence of knotweed and clover, the

development of algae and black scum, puddles, dry spots, and just plain hard soil. If any, or all, of these visual symptoms are present, a profile sample of the soil should be taken.

In the soil sample look for these indications of poor soil structure - the presence of one type of soil, such as clay; or pockets of improperly mixed materials, or parallel layers of different materials.

Any of these indications of poor structure are directly related to the presence of compaction. If any of them exist, root penetration, in addition to the movement of water, is stunted. When this happens, soil particles are easily pressed together, pore space and size is reduced, and the soil compacts.

Compaction may result from ordinary use of the area by golfers, or maintenance men. Other contributing causes of compaction may not be so readily discernible. Poor drainage is high on the list. When soil is saturated for long periods of time, air movement is retarded because it cannot pass through water. Without water, plants die, despite a plentiful supply of water. Also, water is the lubricant that assists the compacting forces.

Poor drainage will also show up in the soil sample. Look for a blue or mottled color. The blue color is caused by the chemical change in the iron content of the soil. Without oxygen, the ferrous form of the iron is changed to the ferric form, and blue color results.

If excess water is present, look for these probable causes:

- poor sub-surface drainage
- seepage
- poor surface drainage

Sub-surface drainage is an important element that should be considered when construction is planned. To rectify errors after building the course is an expensive proposition.

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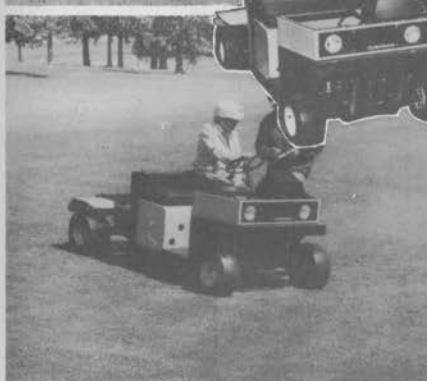
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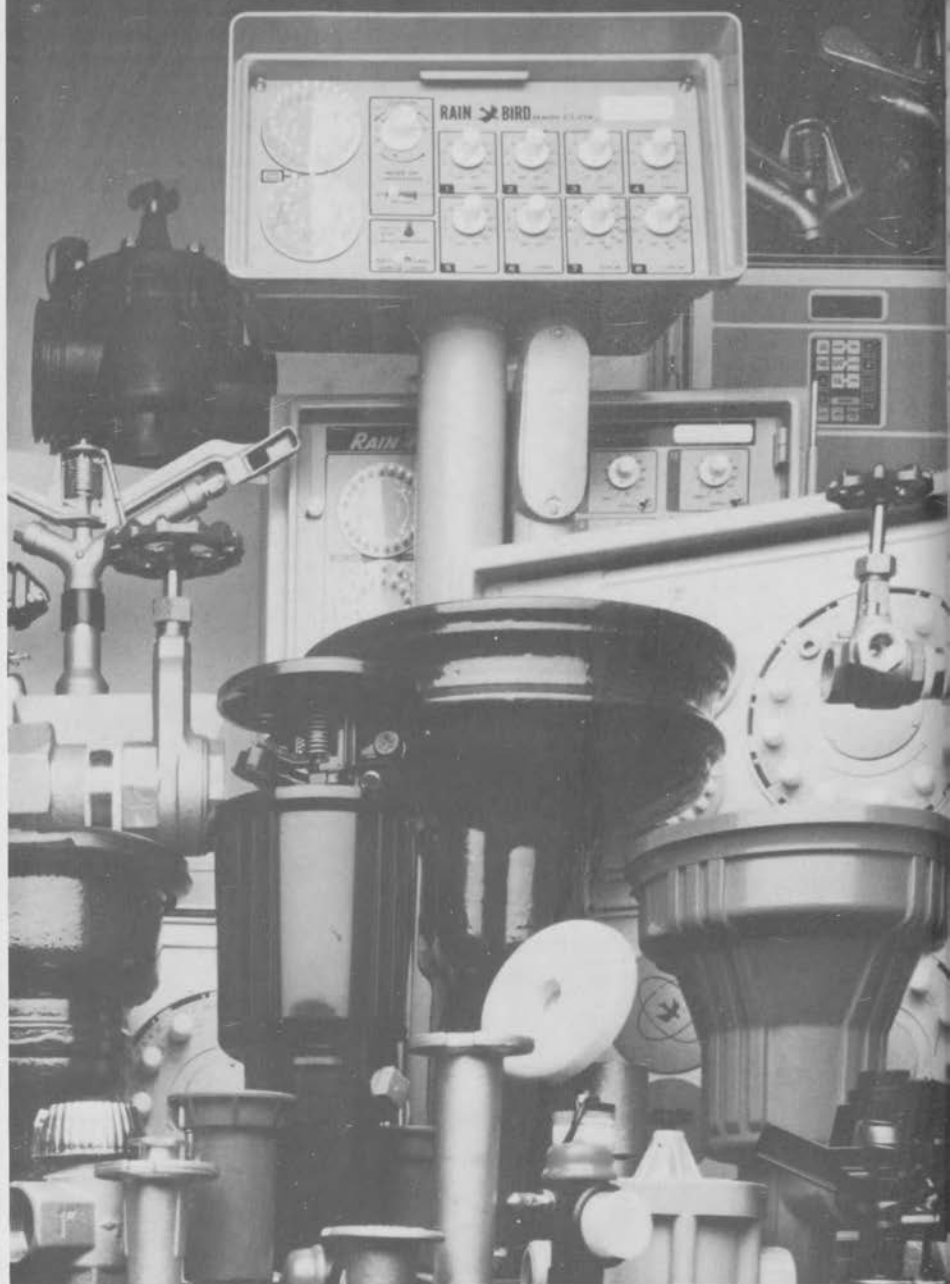
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"TURFGRASS CLIPPING USES"

by Dr. A Martin Petrovic
Dept. of Floricultural and
Ornamental Horticulture
Cornell University, Ithaca, NY 14853

What are turfgrass clippings?

Basically, they are leaf blades which normally contain 75-85% water. What isn't water is 3-6% nitrogen, 0.5-1% phosphorus and 1-3% potassium (a 4-1-3 fertilizer) along with calcium and a few other nutrients. There is little or no lignin or cellulose in turfgrass clippings. Because they are mostly water, clippings do not lead to thatch accumulation. Thatch is composed mainly of stems, crown tissue, leaf sheaths, roots and rhizomes, but not leaf blades.

Collecting clippings? From putting greens and other specialty surfaces, clippings have to be removed. On other areas, one solution to the "what to do with clippings" problem is to leave them there. Collecting clippings is more than a waste of precious energy for you, it is also a waste of energy for the plant. As clippings break down, the "recycled" 4-1-3 fertilizer is returned to the turf. You have eliminated the dumping cost, and have also saved the time of emptying catchers of bags and hauling the clippings to the dump by returning clippings to the turf.

More nitrogen needed. Research at Michigan State University has shown that turf requires up to 2 extra pounds

of nitrogen per 1000 sq. ft. where clippings are removed. These studies showed that turf needs 20-30% more fertilizer if clippings are removed, to match the quality of turf plots where clippings are removed. Thus fertilizer costs can be cut by returning clippings to the turf.

Research at the Connecticut Agricultural Experiment Station showed comparable results. Turf specialists there found that 1.8 pounds of nitrogen per 1000 sq. ft. were removed when grass clippings were collected. In some cases, they found that clippings could return over 50% of the nitrogen that was added as fertilizer. The turf was greener and growth was more vigorous where the clippings remained. Ten years ago, similar studies at Cornell University and at Eisenhower Park in Nassau County showed that turf was greener, more vigorous and more disease tolerant when clippings were left (dollar spot in particular was reduced).

Nutrients recycled. When clippings are short, they fall down between the blades and decompose quite quickly. Tests at Michigan State and Connecticut showed that the clippings are recycled and the nutrient elements are utilized as soon as 7 to 14 days. This

Continued on Page 17

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Prusa Named GCSAA Director of Education

A lengthy nationwide search has concluded with the appointment of James G. Prusa as Director of Education for the Golf Course Superintendent of Pasatiempo Golf Club in Santa Cruz, Calif., will assume his new duties at GCSAA Jan. 4.

"We are all very proud that a GCSAA member would have the credentials to qualify for this very demanding assignment against a field of the best candidates from across the country." GCSAA President Micheal R. Bavier, CGCS, said in announcing the appointment. "We were not looking for a superintendent, but are very pleased to have found one."

As Director of Education, Prusa will be responsible for designing, packaging and administering GCSAA's educational offerings for its more than 5,000 members in the United States and 21 other countries. He replaces Palmer Maples Jr., CGCS, who now serves as superintendent of Summit Chase Country Club in Snellville, Ga.

Prusa said his immediate challenge would be educational programs scheduled during GCSAA's 53rd International Turfgrass Conference and Show in New Orleans Jan 30-Feb. 5. As a member of GCSAA's Education Committee, he participated in the initial planning of that program.

"I think we have a very good program scheduled for New Orleans," Prusa said, "I think the Education Committee did a good job, and I think Palmer ran a lot of good plays in formulating that program."

Other educational programs Prusa will administer include GCSAA's scholarship and Research Fund, Inc. As a student at California State Polytechnic University in Pomona, Prusa received one of GCSAA's scholarships in 1974. He completed a Bachelor of Science degree in horticulture with emphasis on golf turf there as well as a liberal arts degree. He currently is completing work on a Master's degree in business administration.

Prusa comes from an extensive background in turf management. His father James L Prusa, has been superintendent of Aquamarine Country Club in Avon Lake, Ohio, for more than 20 years, and his brother John is part owner of a New York lawn care firm. Prusa has been superintendent of the Pasatiempo course for the past four years. He was only the third superintendent of the Alistair Mackenzie-designed course since it was opened in 1929.

"It's an absolutely first-class championship course. It really was not an easy thing to give up," Prusa said, "As much as I love the philosophy behind this association today, I was very reluctant to leave Pasatiempo."

The opportunities awaiting GCSAA more than offset his reluctance to leave Pasatiempo. However, he said that he would emphasize timeliness and continuity in GCSAA's educational offerings and was looking forward to the challenges awaiting the Association.

"I've always been pleased with the professionalism of our headquarters staff at conferences," Prusa said, "They've got a lot of work ahead of them, too. These are very exciting times for all of us."

Something in your eye?

The human eye is a very delicate thing, and a foreign object there is particularly maddening. First, it's extremely painful, and second, a clumsy attempt at removal can cause very severe damage.

When it happens to someone around you, keep that person from rubbing it. That could drive the object deeper into the eye and make removal even more difficult. If you can't locate the object, or if it seems to be embedded in the eyeball, place a dry bandage over the eye and seek medical help immediately.

If you try to remove it yourself, be sure

Continued on Page 12



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Put the proven performers together for even better control of brown patch, dollar spot and other serious diseases.

TERSAN® 1991 fungicide and Daconil® 2787 are two of the most effective disease control products on the market. And now, these proven broad-spectrum fungicides are labeled for tank mixing. Together, they give you even better control of major turf diseases than with either product used alone. You get improved control, yet without the problem of phytotoxicity common with some tank mixes.

A TERSAN 1991/Daconil 2787 tank mix will give you consistent performance against brown patch and dollar spot—the two most troublesome diseases on turf each summer. You'll also get strong action on leaf spot and other important diseases. It's the kind of performance superintendents depend on when a quality course can't be compromised.

*Daconil 2787 is a registered trademark of Diamond Shamrock Company.

Tank mixing brings other advantages, too. With TERSAN 1991 in your tank, you get systemic action for protection from within the turf plant. Disease control is longer lasting and is less affected by rainfall or frequent irrigation. Tank mixing fungicides with different modes of action also reduces chances of benzimidazole resistance. You help insure the long-term effectiveness of TERSAN 1991 in your disease control program.

This year, plan on using TERSAN 1991 in combination with Daconil 2787. It's the tank mix turf diseases can't match.

With any chemical, follow labeling instruction and warnings carefully.





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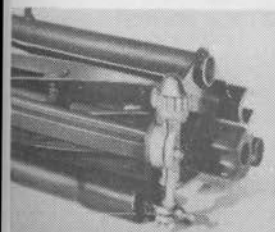
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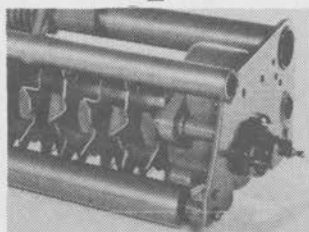
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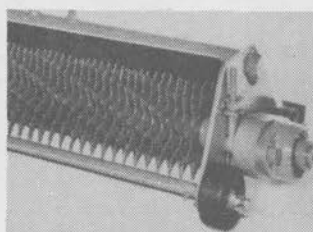
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It's easier to eat an elephant if you cut it into small pieces first. --Impact.

--Willie Sutton, bank robber.

--Japanese proverb.

to wash your hands before examining the victim's eye. If the object is merely floating on the surface of the eye, pull down the lower lid and gently remove the object with the corner of a clean handkerchief.

If the object is beneath the upper eyelid, have the victim look down while you gently pull the lid forward and down over the lower one. This may dislodge the object or loosen it so that tears will wash it away. You also can try flushing the eye with an eyedropper or a small syringe. If that fails, give up and seek medical help. Eyes are too important to damage.

Question: Our golf course superintendent prohibits play when there is frost on the ground. Is this good practice and if so, why?

Answer: When turfgrass plants with a frost cover experience foot or vehicular traffic, permanent damage frequently occurs because walls of plant cells are ruptured. Also, it is possible that the crown of the plant may be damaged, which could result in permanent turf loss. A weakened plant provides an ideal opportunity for weed and disease invasion and a decrease in plant density for the summer stress months. The golf course superintendent has the interest of the majority of players in mind, and he is interested in the maximum use of the course for all seasons when he faces the decision to close the course because of inclement weather.

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Public Golf Courses Scarce In The World

The Second International Conference on Golf Development, held in Stockholm recently, provided the NGF with an opportunity to learn of golf's status around the world. Following are the 15 nations with the largest number of golf courses:

	Total Courses	Private Courses	Public Courses
1. United States	12,511	5,136	7,375
2. Great Britain	1,400	1,200	200
3. Australia	1,357	1,302	55
4. Canada	1,200	1,000	200
5. Japan	710	620	90
6. Scotland	450	375	75
7. South Africa	435	425	10
8. New Zealand	390	375	15
9. Ireland	241	240	1
10. Sweden	145	144	1
11. Germany	132	132	—
12. Argentina	119	110	9
13. Wales	105	105	—
14. France	104	102	2
15. India	80	80	—

These figures show an important factor affecting the development of golf outside the United States is the scarcity of public facilities. According to statistics obtained at the conference, 91% of the foreign golf facilities are private. Obviously, this greatly inhibits the development of additional players.

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SCHEDULE OF EVENTS

1982

The meetings for the 1982 season have been scheduled and the dates are listed below. The educational program slated for the year is; CPR, Toxic Waste, Financial Investments, Poa Annua Research, Cart Paths Course Maintenance, and Tree Maintenance are some of the topics to be reviewed. Play around of golf and discuss ideas with your fellow member at some of the best golf courses in the Metro area.

* March 27	G.A.M. & Michigan border cities at Detroit Golf Club	Host Clem Wolfrom
April 15	Dominion Golf Club	Host Dan Uzelac
May 17	Detroit Golf Club	Host Clem Wolfrom
June 8	Chemung Hills CC	Host Ken Niblock
June 29	Meadowbrook CC	Host Mike Edgerton
July	Open	
August 2	Edgewood CC	Host Ken McRae
August 31	Michigan Border Cities	Picnic
Sept. 14	Forest Lake CC	Host Pete Evans
October 19	Maple Lane	Host C. Wolfrom Sr.

If you are not a member and are interested, join and come out. Looking forward in seeing you at our meetings.

Mike Edgerton
Education Chairman

*Invitation only



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DO YOU KNOW YOUR PEATS?

1. **Raw peat**—obtained from the top of a bog. It is brown in colour and quite fibrous. It is difficult to mix with soil unless shredded first.
2. **Cultivated peat**—same material as raw peat but some decomposition has taken place. It is the next layer in the bog. It usually does not require shredding and mixes well with soil.
3. **Black muck**—obtained from the bottom of a bog. It is greatly decomposed and does little to improve soil texture. It is dark brown to black in colour and has little or no fibres. Not recommended for top-dressing.
4. **Moss peat**—this is sphagnum peat. It is difficult to mix in soil and is inferior to the raw and cultivated peat.
5. **Sedimentary peat**—sediment developed on the bottom of a pond. It is also termed black muck and has no use in golf course maintenance.

Raw and cultivated peats come under the category of woody peat which is derived from roots, stems and branches of trees and shrubs.

Sphagnum peat comes under the category of fibrous moss which is derived mainly from sedges and moss. Sedimentary peat is derived from such plants as water lilies, water hyacinths and cattails.

When preparing a top dressing mixture try and compost it for two months. This will prevent floating out of the peat when spread.

ARE YOU AN ACTIVE MEMBER?



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The kind that would be missed?
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Do you attend the meetings
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Or do you stay at home
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Do you ever go to visit
A member who is sick?
Or leave the work to just a few,
And talk about the clique.

Do you take an active part
To help the work along?
Or are you satisfied
To only just belong?

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Are you an active member,
Or do you just belong?

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Guidelines for Protecting Against Winter Injury

1. Provide good surface and subsurface drainage. The latter involving primarily drain tile, where needed.
 2. Ensure that the turf and underlying soil root zone contains adequate but not excessive amounts of water when entering late fall and winter dormancy.
 3. If a soil compaction problem has developed during the summer, correct by soil cultivation—coring, slicing, etc.,—in early fall. This will also aid in drainage.
 4. Raise the cutting height and/or stop mowing prior to shoot growth stoppage in order to allow an additional accumulation of leaf growth that will function as a protective insulation and enhance both rooting and carbohydrate accumulation that aid in winter survival. However, do not allow too much leaf growth to accumulate to the extent that it increases the potential for snow mold disease problems.
 5. Be sure that any excessive thatch is controlled prior to entering the winter period. This is particularly important in the case of disease and winter desiccation problems.
 6. Be sure that the turf enters the fall hardening period with an adequate nutritional level; but avoid nitrogen fertilization during the cold hardening period when deep rooting, carbohydrate accumulation and decreased water content need to be encouraged.
 7. Ensure that adequate potassium levels are provided. A minimum ratio of nitrogen-potassium of 2 to 1 is suggested.
 8. Provide adequate preventive protection against winter diseases by applying the appropriate fungicide.
 9. Provide an appropriate winter protection cover where desiccation and/or low temperature kill are particularly severe problems and winter play does not occur. In some locations this may involve enhancing snow accumulation.
 10. Do not allow traffic (foot, ski, or vehicular) on turfs during periods of warming when the snow cover is in a wet-slushy condition and a subsequent severe freeze is possible.
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The Secret

I met God in the morning,
when the day was at its best,
And His Presence came like sunrise,
like a glory in my breast.
All day long the Presence lingered,
all day long He stayed with me,
And we sailed with perfect calmness,
o'er a very troubled sea.
Other ships were blown and battered,
other ships were sore distressed,
But the winds that seemed to drive
them, brought to us a perfect rest.
Then I thought of other mornings
with a keen remorse of mind.
When I too had loosed the moorings,
with Thy Presence left behind.
So I think I know the secret learned
from many a troubled way,
you must seek Him in the morning,
If you want Him through the day.
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May you always have enough—
Happiness to keep you sweet,
Trials to keep you strong,
Sorrows to keep you human,
Hope to keep you happy,
Failure to keep you humble,
Success to make you eager,
Friends to give you comfort,
Wealth to meet your needs,
Enthusiasm to look for tomorrow,
Faith to banish depression,
Determination to make each day,
Better than the day before.

Turfgrass Clipping Uses, cont.

was determined by visual observation
and at Connecticut by tracing the heavy
isotopes of a form of nitrogen.

Mulching mower useful. If the clippings are very long, wet or heavy, they should be removed. An alternate to raking is to re-mow the area after the clippings are dry, or to use a mulching mower. A few things should be remembered when using a mulching mower: 1) The turf must be relatively dry before mowing to help prevent machine clogging and the formation of large clumps

Continued Next Page

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Turfgrass Clipping Uses, cont.

of clippings; 2) You will need to mow more often in the spring and fall because of the faster growth rate. If more frequent mowing is not possible during these periods, you may need to switch to conventional mowers; 3) Mulching mowers produce up to 30% finer clippings than conventional rotary mowers which means faster clippings breakdown, deeper and faster penetration of the clippings into the turfgrass canopy and clippings that are less noticeable.

Clippings as mulch. Turfgrass clippings can be used as a mulch around ornamentals, reducing weed competition, conserving soil moisture, supplying nutrients as they break down and help to improve soil conditions especially in fine textured soils. Clippings can be used as a straight mulch, but are better if they are allowed to air-dry first. They can be composed with or without leaves, but either way should be applied at least 1" thick and should be turned under in the fall to help supply nutrients for the next year. As with any mulching material, be on the lookout for slugs. Two things should be avoided when using clippings as mulch: avoid clippings from areas with stolons such as creeping bentgrass since clippings of this type can form into new plants and infest the ornamental beds; and do not use the first several batches of clippings after applying broadleaf herbicides to the turf to prevent injury to ornamental plants.

Clippings as animal feed. You must answer NO to this question before considering turfgrass clippings as an animal feed: "Have any pesticides been applied to the turf?" If you answer YES, strongly consider other alternative for clipping utilization. Dried, pelatized clippings have been shown to be an excellent poultry feed; however, large acreages are needed to produce enough clippings for this process. Sod farmers with limited pesticide usage, have been able to do this to a limited degree.

So, what are you going to do with your clippings? You leave them, dump them or use them as animal feed. Remember that clippings DO NOT create or add to the thatch of the turf.

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