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WHY SOD

Dr. Henry W. Indyk[1]

Lawns, as well as various other turfgrass areas, can be established successfully by means of seeding or vegetative techniques. The vegetative techniques involve the transplanting of growing plant material which includes sodding, sprigging, plugging, or stolonization. Among the aforementioned, sodding is the most common means of vegetatively establishing turfgrass areas.

Sodding is not a recent innovation. This technique has been in use many years primarily from the standpoint of its value in stabilizing soil against the ravages of erosion. Although sodding is classified as an "old-time" technique, the popularity of sodding characterizing the present day industry is of recent date. Many factors can be cited as contributing to the intensified interest in sodding. Certainly, an awareness in environmental improvement has been a very significant factor but the availability of high quality sod and the recognition of the advantages of sodding undoubtedly were most influential. The sod industry rapidly advanced from the "pasture-stage" into a highly specialized industry. The conscientious effort of sod growers contributed immeasurably to the availability of an abundance of high quality sod of superior turfgrass varieties.

The marked improvement in sod quality not only aroused interest but also brought about a rapid recognition of the advantages sodding provided as an effective technique in the establishment of turfgrass areas. The advantages of sodding usually are made in comparison with the most common techniques of turfgrass establishment — seeding. Among its many distinct advantages, sodding provides:

1. Instant beautification — within a matter of hours a bare soil situation can be converted into a living lush green carpet resulting in the immediate beautification of the environment for more pleasant and enjoyable living.
2. Soil stabilization — provides immediate protection of the soil against erosion. In areas involving slopes and drainage channels, a means of providing immediate stabilization of the soil is a very critical factor.
3. Rapid preparation of an area for utility purposes — minimizes the time utility areas such as athletic fields, golf greens, and tees, and other recreation areas are taken out of use. In many situations, areas can be put back in use within a month after transplanting. In addition, areas damaged from concentrated use can be repaired immediately.
4. Extension of the establishment season — sodding can be performed at any season of the year as long as the site can be properly prepared and conditions are favorable for sod harvesting. Establishment from seeding is limited to certain periods of the year.
5. Successful establishment on soils of unfavorable physical condition. On soils of a very light or heavy texture, establishment from seeding becomes difficult.
6. Reduced competition of weeds. Weeds, such as annual bluegrass, crabgrass, chickweeds and others that often threaten newly seeded lawns, lose their competitive advantage when sodding.
7. Opportunity to observe quality before purchase and installation.
8. A high degree of assurance against failure. Sodding reduces the risks of failures during the longer establishment period characteristic of seedings. The risks associated with seedings have been assumed by the sod grower. In order for sod to become a marketable and useful product, it must have experienced successful establishment from seedings.

The advantages associated with sodding become important considerations as a criteria in determining whether to establish a turfgrass area from seeding or sodding. Unfortunately, all too frequently, determinations as to whether to seed or sod are primarily based upon comparative costs of the two techniques with little or no regard as to the advantages or disadvantages of each technique as they pertain to a specific situation. Furthermore, a common fallacy is to base costs of seeding solely on the cost of initial seeding without making appropriate allowances for reseeding necessary to correct failures in germination, repair of damaged areas due to soil erosion or other causes and maintenance costs during the establishment period which may extend for a year or more beyond the seeding date. Seeding is very appropriate and can provide satisfactory results when favorable growing conditions prevail or can be maintained for germination and seedling development. Also, seeding will provide greater flexibility in the selection of turfgrasses for a specific condition or use. However, when there is an immediate need to provide a mature turfgrass cover in a relatively short time for aesthetic or utilitarian reasons, and/or conditions are not favorable for turfgrass establishment from seeding, then sodding is the most effective, efficient, and expedient method of turfgrass establishment. Under such conditions, the comparative costs of seeding vs. sodding should become a secondary rather than a primary consideration.

[1]Extension Specialist in Turfgrass Management, Cook College, Rutgers University, New Brunswick, N. J.

WHAT HAPPENS TO HERBICIDES AFTER THEY ARE APPLIED TO TURF?

The turf growing profession developed an early concern for what happens to herbicides. Through experience we have learned that some deteriorate quickly and others stay around for months. This is necessary information since some herbicide residues affect the growth, rooting and/or germination of the turfgrasses. We lack information on these aspects, and most everyone realizes the difficulty of learning what happens to the herbicide after it reaches the turf. Dr. S. Wayne Bingham of Virginia State University wrote some easy to read information on this subject. He has prepared a chart which is especially helpful in visualizing the contrasts of herbicide residues. The time interval of the charts should not be applied too precisely because the grass species, the nature of the soil, previous herbicide treatments, the weather and other factors will cause significant variations in residue life of the herbicide. The following are taken from Dr. Bingham's article in the Virginia Plant Protection newsletter:

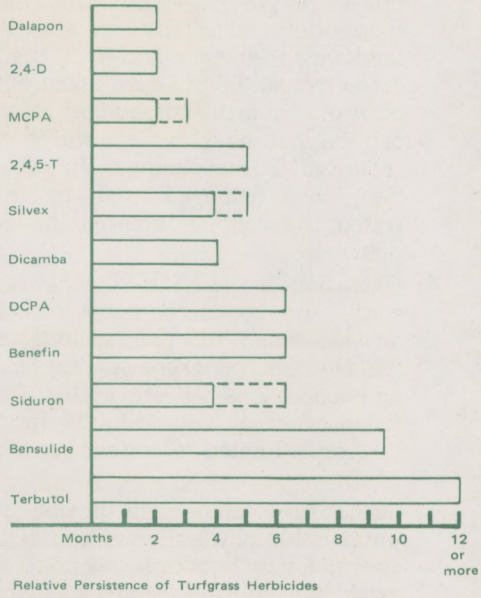
(Continued on page 2)

"A large portion of herbicides applied for weed control in turfgrasses goes into the soil. Postemergence herbicides will reach the soil partially during application and more by rain or irrigation washing the material off the foliage. Some is released to the soil through exudation from plant roots and, as plants die, through decomposition.

"The soil is an ideal medium for metabolizing pesticides. Microorganisms, fungi, and bacteria use organic matter and organic compounds for a source of carbon. In some instances, an organism can survive with a herbicide as a source of carbon. Most of the organisms live in the surface soil where oxygen and organic matter penetrates. Organic matter and clays are so charged that herbicides are held on their surface. Bonding depends upon the charge exhibited by the herbicide. Thus, certain herbicides move into the soil more readily than others. This slow soil penetration is a very desirable feature because a herbicide that moves slowly into the soil gives microorganisms the opportunity to degrade the compound. If it moves through the soil too rapidly, as dicamba does in sandy soils, they may become problems in areas with trees and shrubs.

"Some turfgrass herbicides are degraded more gradually than others. For example, 2,4-D persists for 3 to 4 weeks while silvex remains for 5 to 6 months. These compounds move very slowly into the soil compared with relatively more mobile dicamba, which moves into a sandy loam soil almost as far as water travels. Soil microorganisms are active in degrading dicamba and residues last for 2 to 3 months. In effect, 2,4-D and silvex are absorbed by leaves while dicamba is readily absorbed through both foliage and roots.

"Preemergence herbicides are applied to reach the soil surface where weed seed germination is controlled. These materials must remain in the surface soil for the period in which the potential grassy weed may germinate and complete its life cycle to produce more seed. For crabgrass in Virginia, this may mean from March through September or about 6 months. The following chart gives estimated residues of commonly used turfgrass herbicides:



Relative Persistence of Turfgrass Herbicides

"Some herbicides are inactivated within a few days by volatilization or adsorption to soil particulate matter. Degradation by soil microorganisms play a major role in disappearance of turfgrass herbicide."


The above picture is from the former Hort Farm II, Rutgers University. A 3 to 4% slope and uneven soil are receiving correction for uniform test plot purposes.

The above is not preparation for trench warfare. Nor is it a new highway. It is a terraced field for the new Rutgers Turfgrass Research Center. Nearly one-half of the 26A site will be regraded by late summer and the start of several tests are planned for this date. We expect a question in the minds of some new members who did not read last year's GREEN WORLD is, "Why the grading and terraces?" The purpose was to develop a gentler and more uniform slope. While this is being done, the topsoil will be remixed to overcome variability from tree stump cavities, tree fertilization, tree burning and soil erosion. The slope, except in waterways, will be 1 to 1½% and it is hoped the great erosion control device, known as grass, will maintain the site without further erosion. We hope to make you anxious to see this new site.

Christening of the site is anticipated for the 1975 Turf Research Field Day. For further information on Rutgers Turfgrass Research Field Days, please read on!

NO TURFGRASS RESEARCH FIELD DAY IN 1974

We regret to announce that we will miss our summer visit with our many turfgrass friends because a Turfgrass Research Day is not scheduled. This has not happened since World War II years. We have no objection to the saving of gasoline but our reasons, as you might guess, involve closing out tests on our old site and the developing of test fields and test plots on the new site. Thus, we are not exactly without things to do. We are still maintaining and evaluating most of the tests you saw in 1973. Possibly, you will see some of these in 1975 if buildings and parking lots have not consumed them.

THATCH ACCUMULATION IN RELATION TO MANAGEMENT OF BERMUDAGRASS TURF

An abstract by V. H. Meinhold, R. L. Duble, R. W. Weaver and E. C. Holt from the AGRONOMY JOURNAL 65: 833-835. 1973.

Thatch accumulation and decomposition in a "Tifgreen" bermudagrass [*Cynodon dactylon* (L.) Pers.] putting green was studied in relation to fertility, fungicides, and clipping management. The effects of these practices were evaluated by measuring total thatch accumulation, lignin content of thatch, and soil microbial activity.

Two sources of N, $(NH_4)_2SO_4$ and activated sewage sludge (Milorganite), were applied at rates 0.25 and 0.75 kg/100 m^2 every 2 weeks. Potassium was applied at two rates, 0 and 0.75 kg/100 m^2, to each N treatment at 4-week intervals. Fungicide treatments consisted of 0.18 kg/100 m^2 of Man-

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DR. RALPH ENGEL,

would like to hear

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N. J. TURFGRASS ASSOCIATION

P.O. Box 231

New Brunswick, New Jersey 08903

ganese ethylene bisdithiocarbamate (Fore) and 0.12 kg/100 m^2 of Tetramethythiuram disulfide (Tersan OM) applied alternately at 2-week intervals. For the clipping management treatments, grass clippings were collected from some plots and left on others during each mowing.

The high level of N increased thatch accumulation 30% and lignin content 15% and decreased microbial activity 6% as compared to the low level of N. The Milorganite treatments decreased thatch accumulation and lignin 12% and increased microbial activity 3% as compared to the $(NH_4)_2SO_4$ treatments. Differences may be largely explained by influence of N on growth rates. Application of K had no influence on any of the parameters measured. Fungicide treatments decreased thatch accumulation 16% and lignin content 20% and increased microbial activity 30%; these treatments may have inhibited plant growth. Clipping residue treatments increased lignin 7% and decreased microbial activity 7% as compared to a control. This study suggests that the use of a slow-release N fertilizer applied at a level that maintains acceptable aesthetic turf quality may reduce thatch accumulation, whereas high rates of soluble N fertilizers accelerate thatch accumulation.

Comments — This research report on thatch of bermudagrass contains helpful information for our thatch problems of N.E. United States. This study concluded that bermudagrass thatch increased with increased use of nitrogen fertilizer. This agrees with data reported for bentgrass by Engel and Alderfer (1967). "The Effect of Cultivation, Lime, Topdressing, Nitrogen and Wetting Agent on Thatch Development of Bentgrass." Bulletin 818. Rutgers University. Their finding of differences in thatch development with Milorganite and ammonium sulfate fertilization is of interest. On various occasions, a number of us in turf have observed differences in color an dry spots on turf receiving different fertilizers. While working on his Master's Thesis at Rutgers University, R. N. Cook (1961) encountered differences in organism activity with source of N. All this revives the thought of developing thatch destroying organisms. Also, it is of interest to note that use of carbamate and mercury fungicides did not increase thatch. Their effect on total growth was not recorded. For those who do not work in turfgrass research, these findings show some of the complexities of research as well as some answers. Texas, we thank you for this study.

R.E.E.

ADDING SOIL ORGANISMS

The following commentary on soil organisms is from the Central Plains Turfgrass Foundation Newsletter of April 1974.

"We would like to warn all members against the claims and promises of products that 'activate the soil organisms and greatly improve yields, green color, etc.' Since they *are not* fertilizers or pesticides these materials *are not regulated* in Texas, Nebraska, Ohio and Kansas though they are in some other states. We understand that a Nebraska scientist or two were clobbered with a lawsuit for 'ruining the shysters' business' when replicated trials in Nebraska were negative (you couldn't find any difference attributed to the test material). We haven't tested these materials — they come around too fast — but most are 'Fermentation Products' and all are EXPENSIVE. One superintendent paid $8/gal. for the stuff and it was weaker in alcohol enzymes and organisms than good Home Brew. A salesman left a plastic jug on my file cabinet and it really swelled up when I tightened the lid! Told several people we were using it too, the Liar!

"Fact: A six inch layer of soil weighs 2,000,000 lbs. per acre. Over two tons of microorganisms are in that acre of soil. The total number is beyond comprehension.

"Fact: Any organism that can survive is already there. Adding new ones won't change things any, especially from the air at ½ - 1 gallon per acre. They land on dry soil and are killed by sunshine.

"Fact: Ohio State and Nebraska couldn't find any advantage in such products in extensive replicated trials. So, we are not going to warn you against those products. Try them on a limited scale if you must, with plenty of control area around each trial area and please, send us a pint for analysis!

"If we were poor ignorant consumers we would be protected; but since we are rich Country Club 'Beautiful People' we'll have to watch our own dollars."

Editor's comment: This can be a hot issue. What do you, the reader, think? Perhaps you've had an experience which should be shared with our members.

TAXPAYING OPEN SPACE

New Jersey Agricultural Society

The one million acres of Garden State farmland offer major open space environmental benefits, and still pay $25 million a year in taxes.

Green plants are the source of much of the oxygen we breathe; a single acre of corn, for example, produces enough oxygen for six people for one year.

Planted fields also reduce soil erosion, and hold rainfall until what is not needed by the plants can percolate down and rebuild underground water supplies. In contrast, roads, parking lots and buildings seal off the ground, so that rainfall is forced to run off to streams and lakes, increasing flooding and reducing recharge of ground water.

Runoff from built up areas also increases water pollution, since it carries with it grease and urban dirt and chemicals. And many people are surprised to learn that New Jersey's seven million people put 245 times more phosphate into the state's streams than does its million acres of farmland. Scientists at Michigan State University estimate that the annual body wastes from one human will add as much phosphate to streams and lakes as will be carried by the runoff from 35 acres of well-fertilized farmland.

MOTHER NATURE DOES NOT KNOW BEST

"Mother Nature knows best," said Dr. Barry Commoner in a recent address at a major southern land grant university. If this were a laxative commercial I'd be the first to agree. But in the real world in which we live, Mother Nature is often callous, capricious, and indifferent to the feelings and needs of man.

According to Dr. Commoner, because plant or animal species have not synthesized and retained within their chemical structure a particular chemical, then that chemical must be "bad," because it is not "natural." He didn't say, but I assume, based on his argument, that such chemicals as rattlesnake vernom, curare, and aflatoxin are "good" since they are produced in nature.

In reality, "Mother Nature" isn't perfect. Just because the 2,4-D, DDT, and aspirin molecules are not found in nature in no way implies they are bad (or necessarily good) for man. The lives saved, the headaches eased, and bellies filled because of DDT, aspirin, and 2,4-D are documented to the satisfaction of all but the radical environmentalist and the acutely unenlightened.

Agriculture has often been described as a controversy with nature. Indeed, life itself is dependent on the ability of man to alter the treacherous and unpredictable courses of nature. History is replete with examples of nature at its worst, such as the locust plagues, the black death, and the everyday diseases of man. In our own times we have observed a sharp curtailment in the world problem with malaria and other serious "natural" diseases. Most of us would not hesitate to utilize man-made chemicals to stop any serious infection even though this in essence is upsetting the balance of nature.

I'll attribute many things to "Mother Nature," but I'll never agree with the general statement that "Mother Nature knows best."

FINE FESCUE CLOSEUPS

R. M. Schmit and R. W. Duell

We've been looking closely at the fine fescues. How close is close? Well, this is how the surface of a spreading fescue seed looks at 400x with the scanning electron microscope.

Dr. Jerril Powell and coworkers, at Beltsville, have been able to characterize varieties of Kentucky bluegrass, somewhat by the nature of the waxy epidermal platelets of the leaf blade.

The advantage for varietal identification by the seed or foliage of these important species would be tremendous. The practicality of this approach is being further researched.

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