Green World

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Field Burning Hot Issue In Oregon

The valley grass seed growers brought suit against the Department of Environmental Quality and the State of Oregon seeking an injunction on the legislative measure arbitrarily cutting the number of acres growers could burn.

The DEQ has admitted using money from the Smoke Management Fund to defend the Department in the suit. The defense funds in question come from a tax assessed on seed growers for burning fees and is earmarked for research and smoke management.

Thus, the feelings of Tom Hunton, Seed Council president, which follow are not too surprising: "The frosting on the cake comes from the discovery the DEQ used the growers' tax money to get the ruling against the seed growers. There has to be something wrong with our legislative and judicial system when such things are allowed to happen."

Burning Not Dominant Factor

The U.S. Environmental Protection Agency had to swallow its own smoke when it appeared before a legislative hearing in Salem and admitted its figures on field burning did not support a recommendation that the state tighten up the phase-out schedule for Williamette Valley grass seed field burning.

The federal agency's figures indicate what seed growers have been contending – that field burning is not the dominant factor in causing smoke and air pollution in the Eugene-Springfield area. In fact, state studies show that under the smoke management program of last year field burning contributed less than 3 percent of the total air pollution (measured in tons) and that field burning only contributed slightly to visibility problems during six hours in Eugene.

(Page 2, please)

Physical Considerations In Amending Putting Green Soils

L. Art Spomer, Assistant Professor,
Department of Horticulture,
University of Illinois, Urbana

Most golf greens have two important features which distinguish them from other golf course turf areas: (1) They are subject to severe foot and mower traffic and (2) they are drained. The effects of the traffic are obvious (soil compaction, poor root growth and absorption); however, the effects of the shallow drainage (excess soil water content and poor soil aeration) are less obvious but are generalized in Figure 1. A *perched water table* forms at the drainage level in such a green following irrigation and drainage (1).

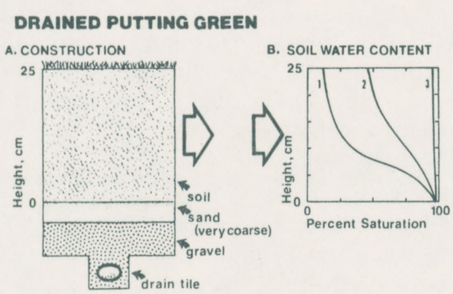

Figure 1. Water distribution pattern (B) for 3 different soils in a typical drained putting green (A). Soil 1= coarse-textured sand; 2= fine-textured sand; 3 = silty clay loam. All 3 soils are saturated at the drainage level (perched water table) and water content decreases with height above this level.

Under these circumstances, any good, medium-textured natural soil will likely be saturated throughout (Fig. 1-B) and grass growth will probably be poor. Both problems are minimized in practice by amending the soil with coarse-textured materials (e.g. bark, calcined clay, gravel, perlite, sand, scoria, vermiculite, etc.) to increase the soil's resistance to compaction and to increase the amount of large or *aeration pores* which drain in spite of the water table (2).

Unfortunately, too little amendment reduces both soil aeration and soil water retention without increasing the soil's resistance to compaction and too much reduces water retension excessively. The "optimum amount" of soil amendment should maximize soil compaction resistance and at the same time provide soil aeration and soil water retention which closely match those required for good turfgrass growth and water absorption.

(Page 3, please)

EDITOR'S COMMENT - *We are greatly appreciative of Dr. Spomer's article which gives a lot of understanding to a difficult and complex subject.*

Most of us in turf have had some involvement in modifying soils for turf at some time. Hopefully, this article will increase success in soil amendment work. Failures happen easily and they can involve large expenditures for sand without giving us the good water percolation capacity of the soil mix which is so vital. Laboratories can be of great help in determining the "threshold proportion" of sand and soil, but the mechanics of determining and mixing the measured amounts are the responsibility of the man in the field.

Allow enough time for checking and adjusting the water percolation characteristics of the soil mixture before it is placed on the future turf site.

Comments and Opinions

Guest Editorial

Most Dangerous Game In Town

Ten thousand years ago life was generally short, nasty and brutish. We spent most of our time simply trying to get enough food and shelter to survive. Afflictions of one sort or another came early, caused enormous suffering and were seldom curable.

Happily, we were able to evolve systems of accumulating and preserving knowledge for future generations. Even more important, we converted this knowledge into useful technology and gained for ourselves longer and more comfortable, healthy, diverse and enriched lives. The advance of technology since the dawn of civilization is, in fact, the underlying base for all improvement in the human condition.

Thus it is surprising that there are powerful elements in our society that seem to be dedicated not just to controlling technology but to summarily getting rid of it. Anti-nuclear groups appear to be seeking elimination of nuclear power rather than improved safety. Prevention of logging in our national forests, not just improved procedures and practices, often seems to be the goal. Anti-pesticide advocates seem to be struggling not just for more judicious use of safer materials but for elimination of pesticides. The list of technologies under attack is endless.

The game being played is the most dangerous in town. The battle tactics are familiar and time-tested. Anti-technologists strive to create deep-seated fears that technology will destroy our environment, destroy us, or both.

Many would argue that there is justification for these tactics because technological developments can occasionally create very substantial risks. Like the proverbial donkey, some overeager technologists may have to be hit on the head with a 2x4 in order to get them to give these risks adequate attention.

Regrettably, the chastisement has gotten out of hand. The nuclear power industry is being slowly strangled by costly delays. The lumber industry is highly concerned about the reliability of government-owned forests as a source of raw materials. The pesticide industry, faced with rapidly escalating costs, is in doubt about its future. Where will it all end?

Not surprisingly the imminent disasters predicted by the environmental doomsayers do not seem to be materializing. The nuclear power industry has not had any serious accidents and has one of the best, if not the best, safety records among all industries. The lumber industry has not ruined our national forests. The rapid growth of the pesticide industry has not brought on the predicted "silent spring."

When pesticides do have a significant impact on the environment, it is usually localized and the environment usually adjusts itself to the impact with about as much ease as it adjusts to a change in the weather. Furthermore, the attempts to connect our general health and cancer problems with the use of pesticides has little or not support from the vast majority of scientific experts in this field.

Fortunately, the sweep of technology is an irresistible force that can be slowed and redirected but never stopped. Technologists are a very hardy breed that seldom give up. When they do, fresh new faces are always there to take their place. Technology will continue to advance, hopefully at an accelerated rate. We are going to need all we can muster to manage the twin problems of too many people and changing sources of raw materials and energy. Personally, I am proud to be a participant in this advance.

Dr. C.A.I. Goring, Director
Plant Science Research & Development
Agricultural Products Department
Dow Chemical U.S.A.

(BURNING, from Page 1)

The field burning problem has been both an emotional and political issue. The facts have been either distorted, disregarded or covered up. The federal EPA has admitted to a meeting of Senate and House Committees that it did not tell the true story when it recommended last January to Gov. Bob Straub that field burning restrictions should be tightened.

Possible Losses

The fact is that the State was a party to the misleading effort on the part of EPA. An EPA memorandum, produced following a meeting with Oregon's Department of Environmental Quality, indicated that unless EPA supported the field burning phase-down, the DEQ was fearful the Oregon Legislature would increase acreage quotas.

Unless the Legislature acts this session to increase acreage burning quotas, which under present law will allow only 20 percent of the total acres in seed grass to be burned in 1978. Oregon faces the loss of a substantial part of a major industry.

• • • •

While burning seems to be the problem of the Oregon seed growers, it becomes one of our problems in the Northeast. At present there is no substitute for maintaining high yield and quality.

Field burning is the only known control for ergot, a sticky substance that forms on seed heads and harbors over winter in the unburned fields and causes abortion in cattle and humans. Most foreign nations will not accept seed with ergot and this is particularly sensitive in Japan and other Asian nations since rice is susceptible to ergot.

Blind seed disease also springs up in unburned fields and cuts seed yields drastically. Weed seed and insects are also destroyed by burning, and unburned fields are soon a mass of wild oats and other weeds if fields are not sanitized after the summer harvest. These things mean higher turf seed prices for the Northeast--Editor.

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(SOIL, from Page 1)

This article briefly discusses the changes in soil physical properties when natural soils are amended with coarse-textured materials.

SOIL AMENDMENT: SOIL PHYSICAL CHANGES

Figure 2 illustrates that soil and sand bulk volumes consist of both solids and pores. Figure 3 "pictures" what happens as a coarse-textured amendment is mixed with soil in increasing proportions. Since soil mixtures are usually prepared from bulk quantities (e.g. bu, ft^3, lit, m^3, yd^3, etc.), component and mixture quantities are herein expressed as bulk volumes. Bulk volume equals the total volume (solid + pore volumes).

Beginning with 100 percent soil (10 yd^3), mixture porosity first decreases then increases with the addition of sand in increasing proportions. Porosity initially decreases because the sand "floats" in the soil or excludes soil and soil porosity without adding any large pores.

The minimum porosity occurs at the *threshold proportion* which is the mixture in which the "mixing bin" is exactly full of sand and the large pores between the sand particles are exactly full of soil. In other words, the threshold proportion is determined primarily from the amendment's interporosity (Table 1).

This is called the threshold proportion because it delimits the minimum proportion of sand amendment required before further amendment begins to improve soil aeration. Since at the threshold proportion the amendment particles first exhibit particle-particle contact, this also delimits the amount of amendment required to improve the soil's resistance to compaction.

As the proportion of sand is increased beyond the threshold, the large pores between the sand particles (amendment interporosity) become voided of soil and both total and aeration porosity increase.

This picture (Figure 3) suggests a simple mathematical model which can be used to predict mixture total and aeration porosities (Table 1) (2). This theoretical model is compared with actual total and aeration porosities of selected sand-soil mixtures in Figure 4. This data demonstrates that the theory accurately predicts mixture physical properties.

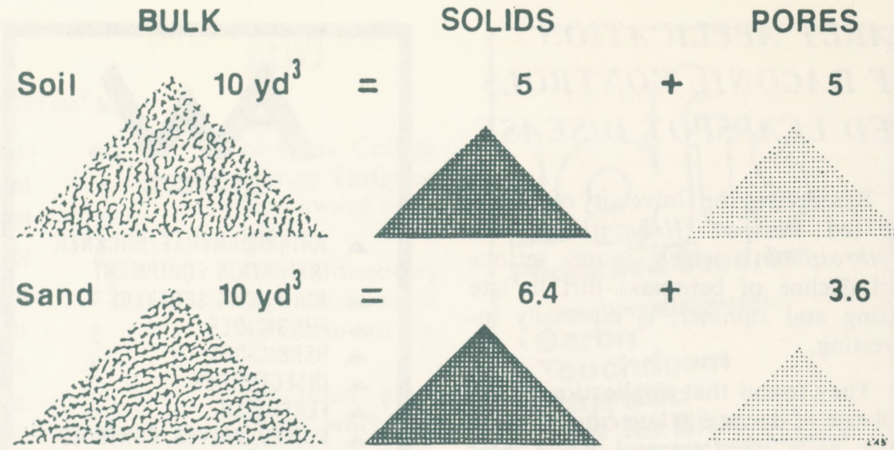


Figure 2. Solid and pore volumes of the soil and sand used in this study.

AMOUNT (bulk volume) OF SAND & SOIL, yd^3 in 10 yd^3 mixture

soil	10.0	7.7	5.5	3.6	2.5	1.5	0.0
sand	0.0	3.5	7.0	10.0	10.0	10.0	10.0
pores	5.0	3.9	2.8	1.8	2.4	2.9	3.6

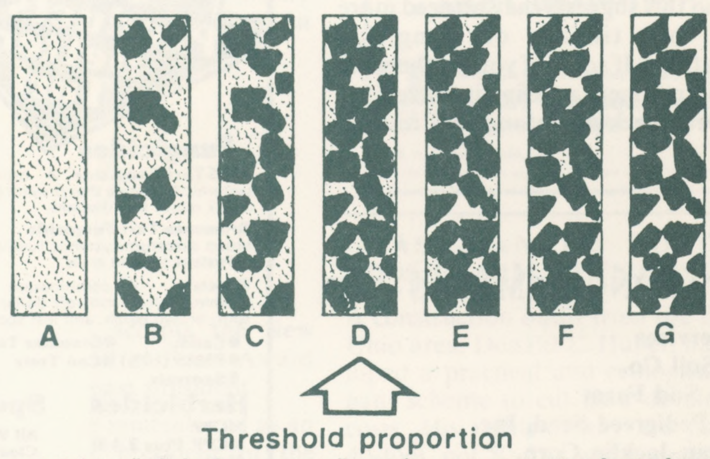


Figure 3. Microscopic "picture" of what happens to soil porosity as a coarse-textured amendment such as sand is added to the soil in increasing proportions.

METHOD FOR PREDICTING

A simple graphical method for predicting soil total and aeration porosities from component individual porosities and bulk volumes is illustrated and explained in Figure 5. The effect of pore size on soil-water distribution in a drained putting green is illustrated in Figure 1-B. In general, soils with smaller pores (soil) retain more water in the upper levels than those with larger pores (sand). The effect of different amounts of soil amendment on soil-water distribution in a drained green is illustrated in Figure 6. The addition of amendment (sand) up to the threshold proportion has no effect on the water distribution pattern; it merely decreases the total porosity. However, when more amendment than the threshold is added, the water distribution pattern changes to that typical of the sand, indicating that large pores have been formed and that aeration should increase.

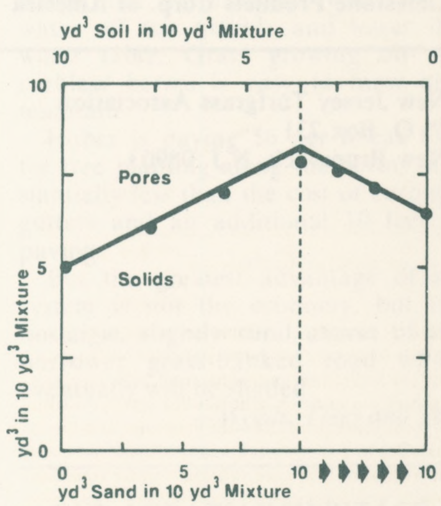


Figure 4. Theoretical (Table 1) and actual porosity in soil mixtures containing different amounts of sand.

As amendment particle size decreases, the soil-water distribution pattern shifts toward the upper soil levels.

When selecting an amendment it is usually best to use one which has a relatively narrow range of particle sizes. Well-graded amendments with large amounts of fine-textured particles should be avoided because they are generally less efficient. (larger amounts usually are required to produce soil physical improvement). Particle shape also affects amendment efficiency but is much less important than size and size distribution.

CONCLUSION

This article does not recommend any specific putting green soil mixture but briefly describes what happens when an amendment such as sand is added to a soil. The "take-home" lesson is that a certain minimum proportion of amendment, the threshold proportion, is required before soil physical improvement is effected, and this amount usually is quite high (75 to 90 percent of the total bulk volume of the components).

The optimum soil mixture depends on soil, amendment, climate, drainage depth, and plant species and is therefore difficult to determine without professional assistance.

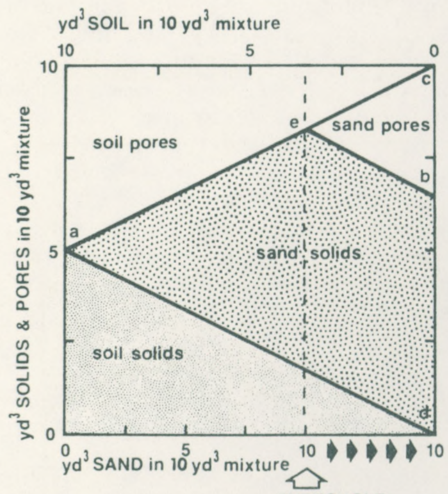
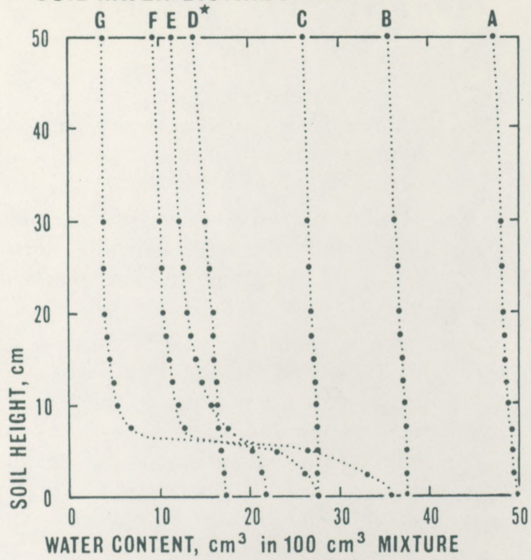


Figure 5. Graphical estimation of amended soil porosity from measurement of soil (a) and amendment (b) individual porosities and bulk volumes. Biagonals a-c and a-d delineate the soil's contribution to mixture pore and solid volumes, and line b-e (parallel to a-d) delineates amendment pore and solid volumes. Soil pore volume = water retention porosity and amendment pore volume = aeration porosity (in the mixture). For example, a mixture consisting of 10 yd³ of this sand plus 2.5 yd³ of soil results in 10 yd³ mixture with 2.3 yd³ total porosity of which 1.2 yd³ is water retention and 1.1 yd³ is aeration porosity.

SOIL WATER DISTRIBUTION



BULK VOLUME, cm³ in 100 cm³ MIX

soil	sand	pores	mix
100	0	50	A
77	35	39	B
55	0	28	C
36	100	18	D*
25	100	24	E
15	100	29	F
0	100	36	G

*THRESHOLD

Figure 6. Water distribution patterns of different sand-soil mixtures in a drained putting green.

Honors and Awards at '76 Expo

Dr. C. Reed Funk of Cook College (left) receives the New Jersey Turfgrass Association Achievement award from Bert Jones, NJTA president.

Dr. Funk's plaque cites his discovery of the procedure for hybridization of Kentucky bluegrass, and is also inscribed:

"You ventured where other plant breeders had failed. Your work has given great momentum to the development of new and future bluegrasses that will make the turf growers' responsibilities easier and provide more good turf for mankind to enjoy. Your outstanding work with Manhattan and other turf-type ryegrasses is most deserving, but we especially wish to recognize your hybridization of Kentucky bluegrass since it is a milestone in Agronomic Science."

* * *

Leo Cleary (left) accepts the New Jersey Turfgrass Hall of Fame Award from Roy Bossolt, past president.

Leo will always be remembered as an organizer and first president of the NJTA. Equally, he has left many wonderful memories in the hearts of his customers through his faith in people and good will.

Come see us often, Leo!

* * *

Kenneth Indyk (left) receives the Hall of Fame Scholarship Award from Ralph Engel, standing in for the Director of Resident Instruction at Cook College and representing the New Jersey Turfgrass Association. Kenneth is a senior at Cook and has taken care of lawns and worked on a golf course. In his plans for a career he leans toward turfgrass equipment.

GRASS-BANKED ROADWAY ADDS CHARM, CUTS COSTS

A construction outfit from the Dayton, Ohio area, Donald L. Huber, has developed a practical and ecologically elegant scheme to cut land development costs. His rights-of-way are paved to 40-foot, not 50-foot width, and flanked by grass-covered, gravel-based berms that blend to sodded swales.

According to the report, the grass swales are more effective in collecting water than storm sewers, which carry water off too quickly and lower the water table. Grass growing on the curbless berms is easy to mow and maintain.

Huber is paying $6 per linear foot for tree planting along the berm, substantially less than the cost of curbing, gutters and an additional 10 feet of paving.

But the greatest advantage of his system is not the economy, but the nostalgic, slightly rural charm of the narrower grass-banked road which eventually will be shaded.

– Weeds, Trees and Turf

OUR AGRARIAN HERITAGE

June 26, 1797 - Charles Newbold of New Jersey received a patent for the first cast iron low.

EARLY APPLICATION OF DACONIL CONTROLS RED LEAFSPOT DISEASE

Research at the University of Illinois on red leafspot *(Helminthosporium erythrospilum),* which causes serious turf decline of bentgrass turf in late spring and summer, is especially interesting.

They found that application of the full rate of daconil in late April or early May gave good control while later applications made near or at the time of the disease occurrence were much less effective. This situation has a parallel with observations on some snow-mold problems where control is improved when the fungicides are applied weeks in advance of the disease attack.

Also this suggests that we need more study on timing of fungicide applications. If some of you try the early daconil treatment and find it convenient to leave a check pass along your results.

SUSTAINING MEMBERS - 1977

A-L Services
Fertl-Soil Co.
Leon's Sod Farm
Loft's Pedigreed Seed, Inc.
Vaughan-Jacklin Corp.
Garfield-Williamson, Inc.
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W.A. Cleary Corp.
The Country Greenery, Inc.
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New Brunswick, N.J. 08903

ABSTRACT

New Red Fescues Perform Well in Trials. C. R. Skogley, University of Rhode Island. Turfgrass Research Review Vol. 3

A 5-year test of 23 fine fescues that were available in 1968 was conducted at Kingston, R.I. The fescues were mowed once or twice at three-quarters of an inch in one trail and at 1½ inches in an adjacent trial. Fertilization was at 1 pound of N per thousand square feet three times per year, and irrigation was applied as needed.

Dr. Skogley points out that while 'Pennlawn' creeping red fescue was a favorite variety in recent years, the quality ratings from these trials indicate that several newer varieties surpassed it. Eight of the nine fescues that were superior to Pennlawn were Chewings types. 'Jamestown', a Chewings fescue developed at Rhode Island, was rated best at both heights of cut for the 5-year period. It was followed by 'Atlanta' and 'Koket' in quality ratings. Biljart (formerly C-26), a hard fescue, ranked among the best of the fine fescues.

Dr. Skogley relates that these fescues are not commonly sown alone, but are used in mixtures with Kentucky bluegrasses. The newer varieties such as 'Jamestown' and 'Highlight' may be aggressive in mixtures, and therefore should not constitute more than 25 to 30 percent, according to other studies at Rhode Island. This contrasts with older varieties that could constitute two-thirds of the mixtures with Kentucky bluegrass.

Comments by Ralph E. Engle, Research Professor in Turfgrass Management, Cook College, Rutgers University.

To ascertain differences among fine fescue varieties, Dr. Skogley imposed rather intensive management on grasses that were available in 1968. A wide range in turf quality was reported. Was this due to general decline of certain unadapted varieties or differential disease susceptibility?

The ranking of fine fescue varieties in Rhode Island is in general agreement with experiences in New Jersey. A newer variety, 'Banner', has been performing on a par with Jamestown at several locations including Rhode Island and New Jersey. The fine fescues that have proven superior under intense management are those that are lower growing.

The turf grower who has not tried these newer varieties has missed something!