

**THE BULL SHEET, official publication of the
MIDWEST ASSOCIATION OF GOLF COURSE
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PRESIDENT'S MESSAGE

This month marks the time when the golfing season really gets under way. I know many of you have had golfers for the past five or six weeks, but all of us feel the full swing of things about this time of year. It sure feels great to be able to finally get out and put those ideas and theories we picked up at conferences and seminars over the winter to actual use on the course. Let's hope they are all as successful as we were told and we can produce better playing conditions throughout the coming year.

I must compliment the MAGCS members who have contributed articles to the **Bull Sheet** in the past few months. We have seen some very informative and well written articles printed within these fine pages and I hope it continues. If you haven't contributed material to the **Bull Sheet** in the past, why don't you consider doing so now. I think every MAGCS member is a potential recipient of the **Ray Gerber Editorial Award** and the honor of receiving it is well worth the effort and time you might expend. So come on, give it your best shot, it really is painless!

This month the MAGCS will again participate in the joint meeting between the Central Illinois Golf Course Superintendent's Association and the Northwest Illinois Golf Course Superintendent's Association at the Kankakee Elks Club in Kankakee, Illinois. This concept originated with John Berarducci when he was President of the MAGCS, and has since raised over \$4,000.00 for research at the U of I. This year the CIGCSA is hosting the event and Bill Bonnett is the host superintendent. The day will be sponsored by Lesco, who, like our past sponsors, have shown a commitment to turf research here in Illinois. It's a great opportunity to get together with superintendent's from other areas of the state and enjoy some exchange of knowledge, ideas, and fellowship. If you know some superintendents from the other two associations, give them a call and set up a golf game. It would be great if each four-some had a person from each group in it.

Best of luck to all the members of MAGCS as this 1984 season gets under way. See you in Kankakee!



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Roger A. Stewart

Roger Stewart, CGCS

MAGCS Directors Column

WHERE'S THE ROOTS?

By Jim Evans, Supt.
Turnberry Country Club

When you are out changing cups this spring and you examine the plug, what do you observe? Stratified layers of sand, soil, thatch, and mat on top of more coarse sand and muck (the original greens mix). Oh, and there's a small amount of calcined clay down there too. Your next question is, where's the roots? Mostly in the thatch and mat but there's a few white ones reaching into the "original soil". This is ridiculous, it's only May 1st, by August 1st the roots will be microscopic. Let's put the plug back before it breaks, besides, the odor of this anerobic soil is quite offensive.

Hopefully, this is not your scenario, but poor soils do exist on many golf courses in the Chicagoland area. We must remember that we are dealing strictly with an artificial ecosystem in regards to soils used as a growing medium for creeping bentgrass. Whether they consist of sand, silt, clay, peat, muck, or various mixtures and percentages of each, they must be able to support plant life. A soil capable of producing optimum plant growth contains 50% solids and 50% pores. 25% of those pores should contain water and the other 25% soil air.

The majority of the golf greens I have sampled exhibit far less than 50% pore space. Numerous factors such as foot traffic, mower traffic, extended use of arsenicals, heavy metals, persistent insecticides, and poor cultural practices all tend to reduce the percentage of pore spaces. Remember that turfgrass roots don't grow in soil, they proliferate in soil air. The less soil pore space (aeration porosity), the less total root area the plant will attain. Top growth is directly proportionate to root growth and vice versa. For example, when you place a roll of sod on concrete it can be kept alive with daily watering. After three months the grass is still "surviving", but exhibits little leaf, stolon, or rhizome growth and stunted roots. Plant roots must have oxygen to survive, and they will take the path of least resistance to obtain it. Even if it means the development of adventitious roots in the airy thatch layer. This is the basis for thatch development, hydrophobic thatch and soil, localized dry spots, wet wilt, puffiness, footprinting, scalping, and poor plant response to fertilizers and pesticides.

Roots are the best indicator of poor soil conditions. If the roots can't survive in the soil, what can? All chemical and biological soil processes are adversely affected. All complex processes of natural soil formation, mineralization, oxidation of organic matter, etc., are reduced, rendering soils less productive. The soil fauna such as earthworms and beneficial insect populations are also greatly reduced or eliminated. How long has it been since you've seen earthworms on your greens after a heavy summer rain? Earthworms are the best aerators we will ever possess. Admittedly, their castings are unsightly and undesirable on the putting greens, but they are responsible for the mechanical mixing of surface organic matter debris with soil. They are our primary means of organic matter introduction into the soil leading to the subsequent humus forming process. All of these processes are virtually non-existent on golf course greens.

As superintendents, what programs can we implement to improve soil conditions? We have no alternative but to improve our management of the soil through cultural practices, which

will in turn stimulate nature's production of a healthier soil and turfgrass plant. I define cultural practices as any entity in the turfgrass environment that we as superintendents have control over. The following are some of the most important prerequisites for better soil conditions.

1. Observe your soils periodically, look for structure, feel the texture, smell if the soil is sweet or sour.
2. Have your soil tested every three years by the best laboratory you can find. They should test for essential elements N, P, K, Ca, Mg, S, Fe, Mn, B, Cu, Zn, also pH, total exchange capacity, % base saturation, % organic matter, sodium content, chlorides, and salt concentration. Have the irrigation water tested regardless of the source - ponds, wells, municipal supply, etc.
3. Correlate tissue tests with soil tests.
4. Balance your fertility program around soil test recommendations and the individual turfgrass species and cultivar nutritional requirements.
5. Avoid use of high salt index fertilizers.
6. Supply no more nutrients than is necessary to achieve the desired turfgrass response.
7. Avoid use of arsenicals, heavy metals, and persistent insecticides. Research has proven these materials have a deleterious effect on the soil flora and fauna.
8. Apply no more fungicides, herbicides, insecticides, or wetting agents than is absolutely necessary for control of pests. Many of these products have a harmful side-effect on soil bacteria.
9. Hire a soil laboratory to perform a mechanical analysis of your soil to determine percent sand, silt, clay, organic matter content.
10. Provide for surface and subsurface drainage.
11. Don't over irrigate.
12. Restrict player and equipment traffic when soils are saturated or cold.
13. Core cultivate with a Greensaire as frequent as possible, preferably spring and fall. With any other machine, you're just 'whistling Dixie'. We all know the benefits coring can provide, for we're now using them on fairways. The benefits will far outweigh the costs of such a program.
14. Incorporate topdressing that will improve not only the soil physical properties such as aeration porosity, infiltration percolation, lateral movement but also the chemical and biological properties. Topdressing material should consist of a texture comparable to that of the underlying soil assuming the root zone has good physical characteristics. Fine textured problem soils would benefit most from a long term use of a coarse textured sand soil mix. At this time, I cannot recommend the use of pure fine sand topdressing unless it is used on a green constructed of pure fine sand. I agree with Warren Bidwell and others who agree that this type of program is a quick fix for an underlying problem.
15. Vertical mow and brush to provide a grain-free, smooth, dense putting surface.
16. Mow at the proper height for your particular cultivar.

In summary, we must realize that golf green soils and the resulting turfgrass ecosystem is extremely complex. We must help Mother nature in all her processes rather than inhibiting them. Let's get to the root of the problem.

The Good Old Days

by Ed Wollenberg, Gary Country Club

Continued from the April issue.

MOWING EQUIPMENT: Greens were mowed by hand with a Toro or Pennsylvania push type reel mower. I believe it was 1930 when we received our first power greensmower. Two Jacobsen 4 Acre mowers. But it wasn't until after World War II that power mowers really caught on. Except during the Great Depression when Toro and Worthington introduced triplex machines, which did cut down on labor but were hard on the grass and ruined areas on the greens. The height of cut on greens was from a very low 5/16" to an average of 3/8". Clippings were put on piles and hauled away whenever possible, but at least once a week. Some times by the 7th day the aroma was not the fragrance of expensive Parasian perfume. Being the youngster I am. I missed the mowing of fairways with horses by a couple of years. At the Olympia Fields Country Club we had Model T Ford tractors pulling 5 units of Toro fairway mowers, or a Model T car converted into a tractor with a "Stade Wheel Kit" available in the 1920's. The height of cut averaged around 1 1/2 inches. The roughs were cut with a side bar mower powered by horses. The beginning of the 30's reel type mowers made their appearance in roughs and were tractor down. We are really getting modernized now. The fairway bunkers were cut maybe once a year and areas around trees and shrubs were cut with scythes. The bunker area around the greens and tees were cut by an ordinary hand type reel push mower. Strictly manpower. I believe it was 1935 or 1936 when the first power reel type mower made its appearance for bunkers and lawn mowing.

FUNGICIDES: There just were not that many fungicides for our problems, and those we had were handled very crudely and hard to apply. The only product we had that really worked with some consistency was Inorganic Mercurials, such as corrosive sublimate and calomel. And of course, it is still around today even with the controversial issue with E.P.A. This product was mixed with sand, milorganite or topdressing and applied by hand, letting it sift over the forefinger and applied in two directions to greens. Fungicides were only applied to greens. In the early 30's, a 55 gallon wooden barrel was introduced that had a hand pump bolted to one side on the inside, and a fitting attached to it where a hose with running water was attached to one side of the pump, and a discharge hose (spraying hose) to the other side. By mixing the proper fungicide rate with water in the barrel, this solution was pumped into the fittings and carried by the running water hose into the spraying hose used for application. We also used a 55 gallon wooden barrel mounted on 2 large iron wheels and a 4 foot boom mounted on the rear and pulled by hand, but this didn't seem to be very effective for fungicide but did work well for applying Ammonium Sulfate. In about 1934 a 200 gallon wooden tank Hardie sprayer was purchased and powered by a power-take off on a tractor, which really made things a lot easier and also do the job more efficiently. We use to spray 2 courses a night, as we felt this was more effective than daytime spraying.

FERTILIZERS: Except for Milorganite, most fertilizers used came in three categories. Hot, hotter and hottest. For fast growth and color, ammonium sulfate was used on the greens. This was put into solution in a 55 gallon barrel to which a 4 foot boom was attached and mounted on 2 iron wheels. We would start

(cont'd. pg. 6)



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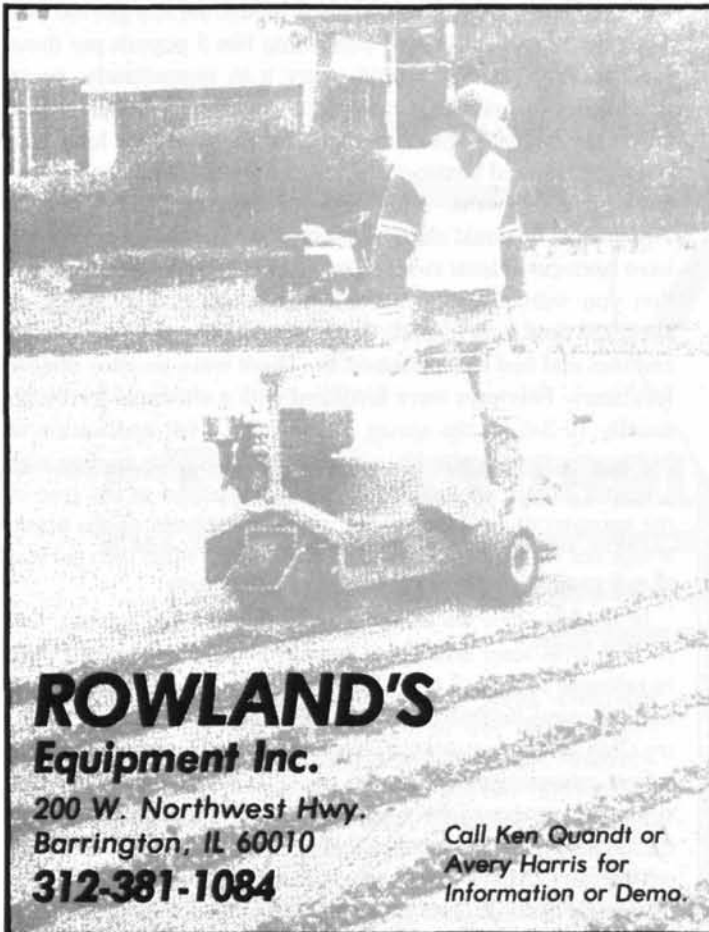
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work at 5 a.m. so we could apply it before the sun got too hot. The rate of application was something like 5 pounds per thousand square feet. We would water it in immediately, being careful not to overwater or underwater because either would burn very badly. We would check for burns all day long, and it was considered a successful venture if you came out without any singes or burns. After about 3 days the grass grew so vigorously you could almost hear it grow, and the greens should have been cut at least twice a day. About 10 days after application you were back to normal growth again. The mixed or chemical fertilizers (usually 5-10-5) were also applied to greens and tees and had to be watered in. There were no slow release fertilizers. Fairways were fertilized with a chemical fertilizer, usually 10-8-6, in the spring and fall and a fall application of Milorganite was applied late. These products were applied with a tractor drawn spreader with a chain attached to the rear of the spreader to knock the fertilizer off the blades of the grass. It was not watered in, but we tried to time it when the rain was in the forecast.

In the late 20's we were also still doing some fairway fertilizing with steer and sheep manure. This was shipped bulk in railroad cars, and placed along a railroad siding of the Illinois Central Railroad which borders the Olympia Field Country Club on the west side. This was unloaded and spread with a farm manure spreader in the late fall. Because of the erratic spreading pattern of the spreader we had to hand rake areas in the spring where the manure had bunched and was smothering out the turf. Also a lot of weeds were planted using this type of organic fertilization. As the mixed and chemical fertilizers became more common and available, this procedure was discontinued.

WEED CONTROL: 2,4-D's had not been formulated or invented yet — they came into the picture about 1944 — so we applied chemicals with trial and error, using Sodium Arsenite and Arsenic Acid which seemed most effective on poa annua, clover, chickweed and crabgrass. At one time (in the 30's) the Milwaukee Sewerage Commission manufactured a product called Milarsenite, which was Milorganite coated with sodium arsenite. This product eliminated a lot of extra work and cost, but it was finally taken off the market for reasons I don't remember. Iron sulfate was also used and gave sporadic results. Broadleaves such as plantain and dandelions were hand picked out of greens and tees, and on fairways they were eradicated by a handmade plunger applicator to which an ordinary fruit jar was attached which dispensed several drops of gasoline to the plant. It was not unusual to see 20 to 25 men and Polish women working on a fairway using this applicator. Usually the results were temporary with only leaf defoliation and regrowth appearing after several weeks. Fertilization immediately after doing a fairway would improve the condition of the turf and help depress the weeds. Of course, today we have 2,4-D and preemergence chemicals that are specific and selective for weed control.

INSECTS: Insects will always be around, regardless of how long the world has been here or how much longer it will continue to be. We may not have heard of Ateanias or Fruit Flies in years past, but I'm sure they were around someplace. And we did have all the other common nemesis such as cutworms, sod webworms, grubs etc. Unfortunately we did not have Diazinon, Dursban and so many other fine insecticides we have

(cont'd. pg. 9)



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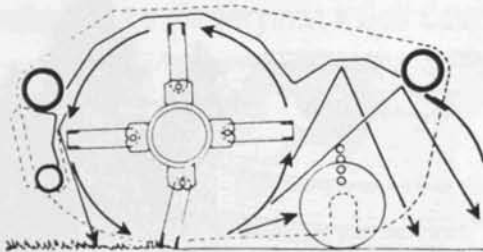
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today. So, we did most of our combatting and wars with Lead Arsenate on any and all varmints we were abused by. One of our worst pest was the earthworms on greens. As we know they do not feed on the turf but live in the soil and interfere with the playing qualities by the casts they deposit on the surface of the greens. They were so bad at times that after poling the greens the putting surface would be black. Also it would pick up on the greensmower roller and raise the height of cut by the accumulation, unless it was cleaned off at each round. Arsenate of Lead acted very slowly on them so we used a material called Mowrah Meal. This was a by-product of the seed of the bassia tree from India after the oil had been extracted from it. It was shipped in 160 pound burlap bags, and real dogs to handle. The Mowrah Meal was applied with a scoop shovel and spread around with the back of a wooden rake, and then watered in heavily. The earthworms would come to the surface almost immediately and we had special rakes that we used to scoop them up. Sometimes we would get 3 gallons of worms from a single green. For fast results but temporary control we would use corrosive sublimate. This treatment was only effective if the turf was well watered before hand, so the worms were close to the surface.

SODDING & SEEDING: Sodding was done by cutting it with a hand sod lifter or with a piece of equipment constructed of two handles, two small wooden rollers, and a cutting blade attached to the handles and frame. It was a 2 or 3 man operation. The person manning the handles and positioned behind the equipment would guide and kick it with one leg, as the one or two men stationed in front of the machine would pull it simultaneous in spurts of maybe 2 feet at a time. It cut a strip of 12 inches wide and at adjustable depths. Any irregularities in the thickness of the sod was then placed, grass side down, on a constructed bench to which pieces of board were nailed on the side to a predetermined height so all strips could be cut uniformly. This was done by using a scythe blade or an old bed knife and slicing off the excess soil by sliding it across this box like bench. Not too many greens were sodded in the early days. They were mostly stolonized or seeded, with stolonizing usually the most common procedure used. The bent seeds we had in the early days were few and not the quality that we have today. Seaside, Velvet, Astoria and Highland were the only bent seed available, with seaside being considered the best for greens. The rye grasses were of poor quality in comparison to today's rye grasses, and were planted primarily as a "nurse" grass where temporary cover and protection was needed for permanent and slower growing grasses to develop. The perennial rye leaf texture was such that it was almost impossible to get a clean cut with a reel type mower. Redtop was also used quite extensively as a "nurse" grass and often referred to as a substitute for bent grass. The blue grasses were of the common type, sold as 21 pound, 24 pound and 28 pound with 28 pound having the plumper seeds and higher germination. Fescues were very popular in the early days with chewings being used in fairway and tee mixture, and sheeps fescue used for roughs and bunkers. Most of the chewing fescue seed was imported from New Zealand and Australia with the germination very poor because of poor storage conditions in the storage holes on the ships and the length of time in arriving in this country. Today of course, almost all seed planted is grown in Oregon, Washington and Canada. We also seeded a certain amount of poa trivialis in

(cont'd. pg. 11)

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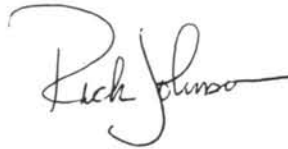
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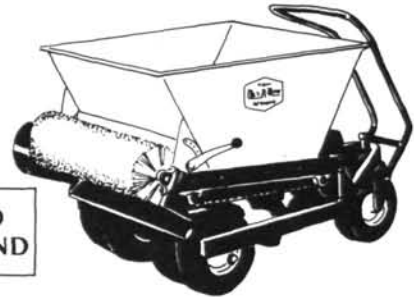

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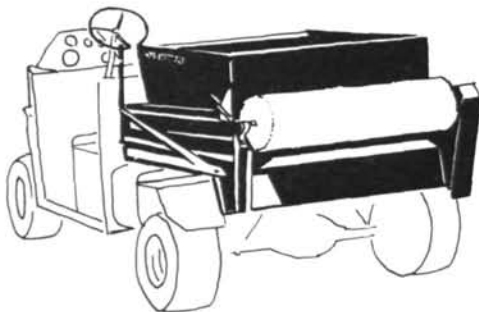
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