

Very fine sand has a great tendency to pack in between the particle of larger size thus making a hard soil quite impervious to water and decidedly undesirable in a green. This point will be emphasized very presently in another table. The high water-retaining capacity of soils No. 3 and 8 as related to their high content of fine sand and very fine sand was referred to a few moments ago. Humus will prevent the packing tendency of very fine sand, hence the advisability of having a high humus content if much very fine sand is present.

FINE SAND NEEDS LOTS OF HUMUS

**F**INE sand has a less propensity to pack than very fine sand but still any considerable quantity of it is undesirable unless associated with a high percentage of coarser sand or with humus. Soil No. 3 is open to much suspicion because of its high content of very fine sand, and fine sand, moderate content of medium sand, and low percentages of coarse sand and humus. This soil contains only 2.5 per cent of humus, you will recall.

Soil 4 might be criticized for its high percentage of coarse sand together with a large quantity of medium sand. I could not agree with this criticism. If soil 4 had 10% or more of humus in place of 4.2% and somewhat more than its 9% of clay and 11% of silt it would make a very desirable soil in my opinion.

To illustrate the undesirable properties of a soil containing too much of the finer sands and silt without adequate humus, I present the analyses of samples taken from two greens, one of which is always in good condition and the other a constant trouble maker.

TABLE IV

Green	Humus	Total Sand	Coarse Sand	Medium Sand	Fine Sand	Very Fine		Clay
						Sand	Silt	
P—Surface	6.1	68.5	1.0	8.6	28.4	29.9	17.2	14.3
G—Surface	9.3	56.2	1.7	8.3	20.2	25.5	28.3	14.3
P—Subsoil	—	84.4	1.4	24.7	39.3	18.9	10.1	7.0
G—Subsoil	—	88.3	7.4	22.1	42.2	12.5	6.2	5.6
P—Subsurface	—	59.2	0.3	0.5	27.0	29.6	24.0	13.7

You will note from table 3 that the surface soil from the poor green (P) contains 3% less humus than that from the good green (G). This soil, however, contains 12% more total sand, slightly more fine sand and very fine sand but decidedly less silt.

The clay content is identical. On the whole there is not sufficient difference in these two soils to account for the vast and constant differences in the quality of the turf.

The subsoil from the poor green is somewhat heavier, that is, richer in very fine sand, silt, and clay, than that from the good green and yet it is sufficiently porous to permit of adequate and rapid drainage. Just below the surface soil in the poor green, however, occurs a layer containing a total of 80.6 per cent fine sand, very fine sand, and silt, each constituent occurring in well above 20%. There is virtually no medium sand, coarse sand, and humus to ameliorate the condition. This layer is very compact and impervious, preventing the escape of excess water and requiring infinite care in watering. This green is an example of attempted economy in construction and to my mind will ultimately have to be torn out. Proper construction in the first place would have been much more economical.

TOP DRESSINGS ARE ALL DIFFERENT

**I**N CONCLUSION let me call attention to the fact that a study of the physical characters of the top-dressing soils used by nine greenekeepers show a very great variation in humus content. There is more uniformity as to the total percentage of sand but much difference in the size of the sand present. The percentages of silt and clay vary in such a manner as to lead one to feel that the quantities present are more or less a matter of hit or miss and not of intention.

Possibly these soils are designed to meet some particular condition prevailing on the various courses. None of these greenkeepers, however, mentioned the use of different soils on different greens, and we must assume that the soils presented are being used on all the greens. It is scarcely to be expected that all the greens on a course will have the same defect although such a situation is entirely possible.

All points considered these soils must be accepted as meeting the various greenkeepers' ideas of good topdressing soils. Does it not seem to you that there should be more uniformity of opinion among representative greenkeepers as to what constitutes a good soil?

# More About Turf Diseases

By ARTHUR BOGGS

*Superintendent of Grounds, Kirtland Country Club, Cleveland*



ARTHUR BOGGS

AT THE very start of my article this month on turf diseases I wish to call particular attention of greenkeepers and other golf officials interested in the maintenance of fine turf—to the “Bulletin” recently released by the United State Golf Association Green Section.

This bulletin deals with “Turf Diseases and Their Control” and is edited by John Monteith, Jr., and Arnold S. Dahl. These men have presented a masterful contribution of the golf world. I sincerely hope that everyone interested in golf turf will read every word of it.

## LOOK TO THE CLIPPINGS

MY SPECIAL remarks this month I wish to confine to the importance of watching the grass clippings as you mow your greens. You have heard the oft-told legend of the battle that was lost . . . but for a missing shoe on a horse. So, likewise may our battle against fungi and turf pests be lost if we fail to note the things which on first thought may seem very unimportant.

During the growing seasons, farmers watch closely the growth of their crops. Experience has shown them that their corn, wheat or rye should be advanced to a certain given point at a definite time of year. If it fails to develop to that point, they know quickly that something must be wrong with their crop.

So it may be with groundskeepers. Any expanse of fine turf under normal weather conditions produces a certain quantity of clippings each time it is mowed. That, figuratively speaking, is the crop. If, for any reason, the “crop” of grass clippings should fall off noticeably, there must be something

wrong with the grass and the groundskeeper should be concerned as is the farmer who notices a definite retarding of growth in his crop.

A decline in the amount of clippings may be due to a number of causes. But, invariably, it is a sure indication that something is wrong. The decrease in clippings may be due to weather conditions, cold nights, lack of moisture, or other causes due to local conditions which the groundskeeper can explain for himself. But, on the other hand, a decline of grass clippings often indicates the insidious presence of fungi. Unless the groundskeeper can definitely place the cause of the decrease in his clippings to some known cause, he better assume that fungi are doing their unseen work—and he should prepare at once to cope with the condition.

Experience has proved that much costly damage to turf can be avoided if the proper preventative measures are taken before the fungi get much of a start. In this respect the good groundskeeper is no different from a good doctor who recognizes that an early diagnosis is the all-important factor in the successful treatment of any disease. For this reason alone, it pays big dividends to “watch your grass clippings.”

## BE CAREFUL OF DEADLY POISONS

IN CONCLUSION, let me offer this one word of caution. In your zeal to prevent the growth of fungi, do not attempt to clutter the soil with deadly poisons. It is true that you may destroy the harmful pests, but it is likewise true that you may harm also bacteria in the soil that are necessary for plant life.

My experience has proved that fungi grow faster on the grass blades because fungus is a lover of oxygen and oxygen is more prevalent on the blades of the grass than in the soil. Therefore, it is advisable to treat the grass leaves for fungi attacks rather than treat the soil.

# Market Place *and* Buyers' Guide

Where reputable manufacturers and dealers list and describe their products. Greenkeepers are requested to write the Market Place for any special information they desire about supplies or equipment.

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Armeo Culvert Mfrs. Association  
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Royer Foundry & Machine Co.  
Beardsley & Piper Company  
Silver Mfg. Company  
Kemp Mfg. Company

## Compost Screen

Silver Mfg. Company

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John H. Graham & Co., Inc.

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Wendell P. Miller and Associates

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Ideal Power Lawn Mower Co.  
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### Trees

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### Turf Fertilizers

Armour Fertilizer Works

### Underground Hose Locker

McClain Brothers Company

### Urea

Synthetic Nitrogen Products Corp.

### Water Pipe

McWane Cast Iron Pipe Co.

### Wood Charcoal

Wood Charcoal Research Bureau

### Worm Eradicators

Peter Henderson & Co.  
C. B. Dolge Company  
Reade Mfg. Company

## Improving Soil

The use of charcoal for improving soil in greenhouses, nurseries, gardens, lawns, golf courses, etc., is being carefully explained by the Cleveland Charcoal Supply Company, 3905 Jennings Road, Cleveland, Ohio, in a circular recently issued.

Practically all groundskeepers who wish porosity and moisture-holding qualities in their turf, use charcoal from time to time. It also absorbs poisons and thereby has considerable effect in preventing turf diseases.

The above company has had many years' experience and personal contact with growers of fine grasses. They will be glad to pass along the information they have gained from these contacts, to any of our readers who write them at the above address.

## Ideal Appoints New Distributor

The Ideal Power Lawn Mower Company, Lansing, Michigan, who have operated a factory branch at 413 West Chicago Avenue, Chicago, Illinois, for several years, have just announced the appointment of the Chicago Fence & Wire Company, 4400 Addison Street, Chicago, Illinois, as exclusive distributors, the new arrangement providing that the entire business as well as all of the territory formerly covered by the branch is now to be handled on an exclusive basis by the new distributor.

The new distributor in broadening their activities in this territory have also adopted a new name conforming with their added activities, and henceforth will be known as the Chicago Fence & Equipment company.

Details of the arrangement have been so completed as to assure all Ideal users in this particular territory getting the same service as in the past, the new distributors taking over practically all of the personnel that has been connected for years with the Chicago Branch, including not only members of the Sales Department but also the same force of service mechanics.

### Marvel Turf Conditioner

Walter B. Helms, Inc., Box 123, Lima, Ohio, announces a new and novel piece of equipment for use wherever fine turf is grown. It is called the Marvel turf conditioner and is a combination of spiker and compost distributor.

According to the maker's description this machine pierces the sod to a depth of two, three, four or five inches as desired. After this operation, the machine stops, allowing the material which is carried in a hopper on the machine to flow into a lower valve which automatically opens, permitting the holes pierced in

the previous operation to be filled on a level with the turf. The flow of material from the lower valve is then stopped as the machine advances under its own power, four inches, where the piercing and filling operation is repeated.

The area covered is two feet in width, for the full length of the green. The result is that the entire area has been pierced to the desired depth four inches apart and every hole completely filled.

Groundskeepers should be interested in this labor-saving device and are requested to write the above company for complete and detailed information.

### Digging Dirt at Lower Cost

A new  $\frac{3}{8}$ -yard convertible shovel which is light enough to mount and transport on a heavy-duty motor truck is announced by the Bearcat Shovel Works, a division of the Byers Machine Company, Ravenna, Ohio. They call it the Bear Cat Junior.

This outfit sells for considerably less than any other shovel in the Byers' line, and is the result of this company's 50 years of experience in building, excavating and material handling equipment.

The Bear Cat Junior weighs  $6\frac{1}{2}$  tons complete as a shovel. This light total weight is practical chiefly because of the balance of machinery which eliminates all dead counterweight, its extremely simple construction which allows all parts to be amply rugged, and its freedom from crawler mechanism beneath the machinery deck.

A new 24-page, illustrated booklet, "How to Dig Dirt at Lower Cost," describes this machine and shows many of the ways to use it. Free copies are available by writing to The Bearcat Shovel Works, Ravenna, Ohio.

### New Hoover Sprinkler

Groundskeepers of private estates, parks, cemeteries, and schools and colleges will be interested in a new sprinkler announced by the Hoover Steel Ball Company of Ann Arbor, Michigan. It is called the "Rain Square" and sprinkles a square area. The "Rain Square" revolves when in action by an ingenious engineering development controls the flow of water in such a way as to limit the area sprinkled to a perfect square, ranging in size from 3 to 30 feet, depending upon the water pressure applied.

The advantages are that it saves 57 per cent of the water bill, does not wet the sidewalk or the paint on the side of the house, reaches into corners that the conventional type sprinkler is apt to miss, and produces a gentle stream which cannot injure a delicate lawn or frail flowers. The sprinkler revolves on famous Hoover stainless steel ball bearings that the makers say will last forever.

### New Seed Company

A new corporation is now fully organized and operating in the seed industry. Its purpose is the wholesale distribution of mixed lawn grass seed in the eastern district. Some of the directors are present officers of J. M. McCullough's Sons Co., Cincinnati, Ohio, and I. L. Radwaner Seed Co., Inc., New York City, N. Y.

This selling organization does not alter the status of either of the above-named firms, who continue their other lines of business as heretofore. The name and address of the new corporation is Radway-McCullough Seeds, Inc., 115 Broad Street, New York City, N. Y.

## Fairway Watering

(Concluded from page 10)

quently through this watering process, it is not at all unlikely that experience will show that the equipment of watered courses may have to include some form of machine to combat this baking effect.

Some one of the many forms of spikers may have to be called upon. They are being strongly recommended for greens by prominent investigators, so if artificial watering is adopted, why should they not be as desirable for the fairways? From a machinery standpoint this may be easily accomplished and the time required for spiking an entire course will add but little to the work of the maintenance force.

## Asphalt for Trees

The Allied Products Company, Terminal Tower, Cleveland, Ohio, wish to announce to groundskeepers who have charge of the care of trees that they carry in stock an asphalt preparation in 5-gallon steel pails.

They are also producers and distributors of peat moss and peat humus and are agents in the Cleveland district for the famous Ohio lawn mower made by the Ohio Cultivator Company, Bellevue, Ohio.

Inquiries will be given prompt and accurate attention.

## What Potash in Soils

An outfit for determining the available potash in soils has just been offered by the LaMotte Chemical Products Co. of Baltimore, Md. It is a complete portable outfit which can be used in the field or laboratory in studying the potash requirements of various soils. The results obtained are given in pounds of potash (potassium) per acre.

It is interesting to know that accurate tests of the soils can be made without any special training on the part of the user. The outfit is shipped complete with special glassware, carefully standardized reagents and a booklet of full instructions.

## Cleveland Meeting

Twenty-four members of the Cleveland District Association of Greenkeepers attended the monthly meeting held February 13. The main speaker was Professor George M. McClure, of Ohio State University. He spoke mainly on fertilizers and brought out many good points which were discussed with interest. Frank W. Ermer, president presided.

# Minnesota Notes

By H. E. STODOLA, Secretary

**T**HE February meeting of the Minnesota Greenkeepers' Association was held at Minikahda club, Monday, February, 13. Seventeen members were present.

The National convention was discussed by the members that attended. Some of the members felt that there was repetition in the conferences. They claimed that some of the things were heard at other conferences. Very true. But there is bound to be repetition when the same subject, golf course maintenance is discussed.

Many of these subjects are becoming second nature to us because of repetition. We learn by repeating. Therefore, any subjects that are repeated are worth repeating and that is how we learn.

The Golf show brought comment from every member. The gang mowers on greens are carrying out the fairway idea. Time can be saved but that point has been conceded for some time. However, the question still holds whether power mowers can do as good work as hand mowers.

Greens are the heart of the golf course. No matter how fine the layout, tees or fairways if the greens are not very fine the course is not high class. Therefore, if better greens can be maintained by hand mowers at some additional expense, you will always have greenkeepers who will continue to use hand mowers.

### MAINTENANCE STANDARD MUST BE HIGH

**G**OLF courses should be maintained on a high standard and every cent that can be saved by equipment can be used on other parts of the course. But as hard pressed as many greenkeepers are they continue with hand mowers on their greens because of promoting better growing conditions. This district uses more hand mowers than power mowers on the greens because of superior work, fully realizing



H. E. STODOLA

that some much-needed money could be saved by power mowers.

The sprinklers displayed at the show were all looked at closely. Smaller-sized nozzles should break up the water better and give more efficiency with less pressure. They also do away with dead ends on water lines and forming loops, stabilizes the pressure throughout the line.

Many clubs in this section have cut down their electric bill. That means less pumping on the course for watering. It is a problem for thought because the more kilowatt hours used the more per kilowatt. Figure it out.

Chairman Feser made it very plain that every greenkeeper should keep maintenance figures so he has a basis for a budget. He emphasized that the greenkeeper should know where he stands all the

time. With figures to back his statements he can stand shoulder to shoulder with his Green committee chairman and discuss means of saving that are reasonable.

### HITTLER DISCUSSES FAULTY CONSTRUCTION

**O**NE of our members came over 250 miles to this meeting. He was Jacob Hittler of Duluth. He told us of some of the troubles caused by faulty construction. On his course the top soil is not over four inches deep. The construction foreman plowed most of the fairways eight inches deep, turning under the good soil and bringing dead clay to the surface. Then the greenkeeper had to raise grass on this subsoil. It is things like this which a greenkeeper has to overcome that the player knows nothing about.

There were three hours of lively discussion which covered the Convention, gang mowers on the greens, water systems, budgets and faulty construction. The next meeting will be Monday, March 13, at 1:00 o'clock at the Minikahda club.

### Domestic peat HUMUS

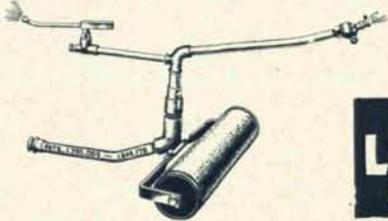
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right or left by simply  
turning thumb screw  
as shown below.



Made of everlasting brass, mounted on  
iron roller for ease in moving. Easily  
covers an area 100 feet in diameter.  
Spreads water evenly and gently.  
"Better Than Rain." It's the same  
famous, precision-made LARK Sprinkler,  
but at a new low price. Now only  
\$12.50 prepaid.

Ask about the TEE Sprinkler at \$7.50

**L. R. NELSON MFG. CO.**  
1725 S. WASHINGTON, PEORIA, ILL.



**SPIKE DISC**

(PATENTED)

Lawn and Green  
Cultivators

For Greens  
Two-  
Handle  
Model  
(Illus.)  
\$30.00

Single-  
Handle  
Model  
\$27.50

For  
Fairways  
Tractor  
or Horse  
Model  
\$120.00

"Use  
Regularly"  
Say  
Authorities

## Turf Aeration Required by Fairways and Greens

Authorities agree that Turf Aeration and the cultivation of a moisture-retaining mulch are essential for the proper maintenance of fairways and greens.

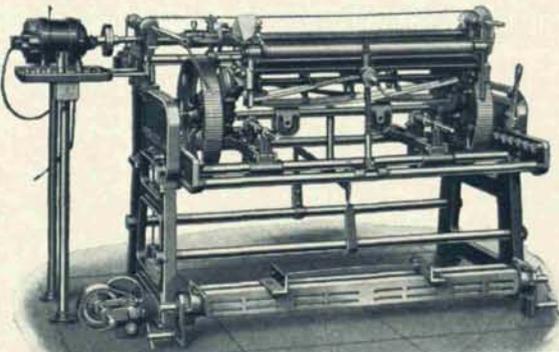
Spike Discs double the effectiveness of reseeding and fertilizing. Seed and fertilizer settle in the close perforations made by the knife-like blades and are not blown or washed away. The patented spike design prevents ugly holes and hard edges made by old style implements equipped with round or square spikes. The moisture-laden mulch made by Spike Discs discourages "brown patch" — offsets the ground-hardening effects of drought and hot sun. Every course needs Spike Discs.

Write for Details and Prices to your Golf Equipment Dealer, or:

**JOHN H. GRAHAM & CO., INC., Sales Agents**  
113N Chambers St., New York - 268 Market St., San Francisco  
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Manufactured by WILDER-STRONG COMPANY, Monroe, Michigan

## The New PEERLESS JR. Mower Sharpener



A high-grade Mower Sharpener of ample size and capacity at a very low price. Grinds all makes of power mowers and tractor units with blades up to 36 inches wide, as well as putting green and hand lawnmowers, with or without removing wheels or reel knives. Grinds reel knives with proper clearance or bevel and to fit straight blade even if latter is bent or sprung. New automatic weight feed—very fast and accurate. Equipped with Reconditioner for "lapping-in" with emery paste; Attachment Bar for grinding badly worn straight blades, and Special Grinding Wheel for grass and hedge shears, sickles, scythes, etc. Direct-drive  $\frac{1}{3}$  H.P. Westinghouse motor or with tight and loose pulleys for belt drive. Write for descriptive folder and price.

**THE FATE-ROOT-HEATH CO.**  
733-769 BELL STREET PLYMOUTH, O IO

## KEEP BROWN PATCH ON THE OTHER SIDE OF THE FENCE



With **FUNGOL**

The "McClain System" Will Help You This Season. Get Started Early with FUNGOL To Prevent Brown Patch and Soil Vermin

Greenkeepers all over the country will begin the use of FUNGOL in April and continue throughout the playing season with regular scheduled treatments. Brown Patch, Grubs, Beetles, Sod Webworms, and Earthworms are almost sure to infest your Greens, unless you protect them regularly against these troubles.

Let us explain the double action of FUNGOL and the "McCLAIN SYSTEM" to you. You will be surprised at the big saving you can make from the extra covering capacity and efficiency of FUNGOL.

No cost whatever to receive full details with complete Record Charts for your own use, and testing samples of FUNGOL and VEG-E-TONIC. Write us at once.

**McCLAIN BROTHERS COMPANY**  
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### VEG-E-TONIC

The "Cool Food" for Putting Greens. Dissolves in water. Easily applied. Leaves no injurious residue. Highest in Nitrogen, Phos. Acid and Potash. Does not burn or streak the grass. Very economical. "A Little Goes a Long Way"