Culti-Hoe your fairways

The new **Evans Fairway Hoe** will cultivate and aerate your fairways — promote healthier, thicker turf growth and develop deeper, stronger roots.

The model shown will cover 30 to 40 acres per day with a tractor. The heavy duty prongs penetrate the soil and give your grass the full benefit of both fertilizer and water.

The angle steel frame is of flexible construction that adjusts itself easily to all conditions and is strong enough to support any weight without bending prongs, where additional weight is deemed necessary to get proper penetration in heavily crusted soils.

In light soils where penetration must be regulated, the Depth Regulating Wheels permit of independent adjustment at each end to suit conditions.

Write for catalog and price list on the complete line of Evans' Golf Course Equipment.

**EVANS IMPLEMENT COMPANY**

569-71 WHITEHALL STREET, S. W.

ATLANTA, GA.

FLAGS • POLES • **IF IT'S SOLD BY EVANS IT'S GOOD** • HOLE CUTTERS • CUPS
All parts of Skinner System self-closing snap valves are removable above ground without disturbing the body of the valve, the piping or the turf.

This patented construction is probably the greatest convenience offered to operators of hoseless watering systems.

Just one of numerous
SKINNER SYSTEM
exclusive features

THE SKINNER IRRIGATION COMPANY, 415 Canal Street, TROY, OHIO

LOWEST COST POWER
AND HAULING EQUIPMENT
used for 20 years in agriculture... now adapted for the Golf Course.

The PULLFORD unit... PLUS any used Ford A or Chevrolet chassis... and you have an efficient, all-purpose TRACTOR... at a saving of HALF or more.

Rubber tires or studded steel wheels.

Supplies every power need on the course. Quickly, easily attached. Low operating and upkeep cost (regular Ford or Chevrolet repair parts).

DUMP TRAILERS... WAGONS

Rubber or steel tired wheels; sturdy; ample capacity; many exclusive features.

SPECIFICATIONS, PRICES ON REQUEST
THE PULLFORD CO. QUINCY, ILLINOIS

WELL-KEPT COURSE
HEALTHY GREENS

SUCCESSFUL CLUBS...
Attract membership. Keep greens free from brownpatch with CALO-CLOR.* Made to formula approved by Green Section, U.S.G.A. Economical, easy to apply. Specify Mallinckrodt to your dealer or write for information from —

*TRADE MARK REG. U. S. PAT. OFF.

Mallinckrodt
CHEMICAL WORKS
2nd AND MALLINCKRODT STS., ST. LOUIS, MO.
70-74 GOLD ST., NEW YORK, N. Y.
CHICAGO PHILADELPHIA TORONTO MONTREAL

*TRADE MARK REG. U. S. PAT. OFF.
A Post Card Will Bring Complete Information Without Obligation . . .

Every Greens Committee will welcome the good news the Peerless Mower Sharpener brings — that all cutting units are in perfect condition — that this year your Fairways will be the envy of Clubs for miles around. The PEERLESS sharpens all makes of power mowers and tractor units in half the time taken by ordinary methods. Attach to light socket. Simple to operate as A B C. Get the facts today. Send postal to . . .

THE FATE-ROOT-HEATH CO.
409 Bell St.
PLYMOUTH, OHIO

JAPANESE YEW
THE ARISTOCRAT
OF
EVERGREENS

2 to 2½ Feet
High. Balled
and Burlapped

$5.00 F.O.B.
Fort Wayne,
Ind.

Evergreens
Our Specialty

Catalogue
on Request

REAM NURSERY
FORT WAYNE, IND. R. 2

MOWERS

A new type Sickle Bar Mower for cutting hay and weeds in rough.

Before purchasing any mowers, it will pay you to write us and have our complete mower catalog on hand.

Power, Fairway, Greens mowers, Tractors.

ATTRACTIVE PRICES

Write for Catalog

NATIONAL MOWER CO.
839 Cromwell Ave., St. Paul, Minn.
GRASS CUTTING EXPENSE REDUCED

New economies ushered in by

CLEMSON LAWN MACHINE

Save Time and Maintenance with this new lawn machine. It is the lightest mower of any giving a full 17-inch cut—and the easiest-running. Cuts perfectly throughout its entire life without regrinding. The blades of special steel, bent to shape and cast on a one-piece reel without rivets, stay sharp and in perfect alignment. Bedknife and roller settings are quickly and easily made by hand—no tools are needed—nothing else to adjust. No oiling or greasing required, ever. Rubber tires and chrome plate and baked yellow enamel finish.

Save Investment. The Clemson Lawn Machine will last for years—permits cutting with less labor, eliminates regrinding delays and expense.

Get Better Looking Grounds. Your men will do more accurate work with the Clemson. It leaves the grass smooth and even, and mows closer to obstacles such as fences, trees, shrubs, etc. These and other major economies are due to original, unique, modern design, construction and materials. The Clemson Lawn Machine is the finest, more efficient, most durable and beautiful lawn mower yet produced for golf clubs, parks and other places where grass-cutting is a real business expense.

Ask your supplier to demonstrate the Clemson Lawn Machine. If he hasn't it in stock, write us for complete information.

THE NEW
RAIN BIRD SPRINKLER

THE OSCILLATOR ARM—forced outward by the stream and returned by the spring—sets up a striking or tapping driving force that is positive and steady. There is never any whipping or uncertain turning. No internal mechanism to interrupt flow. This insures maximum coverage.

Write for complete information.

For all states east of Colorado:
L. R. NELSON MFG. CO.
PEORIA, ILLINOIS

For states west of Colorado:
RAIN BIRD MFG. CO.
GLENDORA, CALIFORNIA
"Perfect" Golf Course Equipment

"Perfect" Turf Plugger
Cuts plugs 3 in. in diameter, and 1 1/2 in. thick, which are interchangeable and can be used without trimming.
Each, $3.50

"Perfect" Practice Green Markers
Finished in aluminum and black, and furnished with cast iron base, which holds marker upright when stood on the turf.
Each, $1.50

"Perfect" Steel Flag Pole
Made of 3/4 in. tubular steel and finished in bands of black, orange and white.
Set of 9............$18.00
Each ..................2.25

"Perfect" Hole Cutter
Patterned after imported English model.
Ea. $12.00

"Perfect" Turf Renovator
Made with tool steel cutting blade.
8 in. ..........$14.00
10 in. ........16.00

"Perfect" Aluminum Hold Cup
Light weight cast aluminum.
Set of 9.............$15.75
Set of 18............29.00

Order from your dealer or
ARTHUR D. PETERSON COMPANY, Inc.
420 Lexington Ave.
New York

DANGER AHEAD

... unless your turf is fed a complete, balanced plant food!

Let Swift's Service Men analyze your individual feeding problems—FREE!

- Springy, close-matted turf, velvety greens—you can't attract many new players without them, as you well know.

To keep your course at its best, follow the example of many other leading courses. Ask the advice of Swift's Soil Service Men as to the proper balanced diet for your greens and fairways. The long scientific experience of these experts is at your disposal on request to Swift & Company Fertilizer Works, U. S. Yards, Chicago.

SWIFT'S SPECIAL GOLF FERTILIZERS and VIGORO

Special balanced plant foods to suit your special needs
At the Royal Hawaiian
PABST Gets the Call. Blue Ribbon is the smart world’s choice at this Pacific Paradise. A hotel of indescribable beauty, fronting the world-famous surf and sand of Waikiki Beach.

America’s Smart Clubs

GIVE PABST THE PLAY

. . . AND WIN PROFITS THROUGH PRESTIGE

*Smart clubs the country over Give Pabst the Play! For Pabst is lighter, drier, for keener refreshment. And this lively, zestful beer draws the smart crowd... the customers that really pay. There are profits in prestige—and nothing can bring Class to your bar or tables like PABST — the class of all beers. Make Pabst your password to prestige . . . and profits.

FREE MENU RIDERS* These appetizing full color pictures of practical and popular meals are increasing check averages for hundreds of clubs, hotels and restaurants. They’ll work for you, too. Write for samples. Dept. 418, Premier-Pabst Sales Co., Chicago.

* Only in states where permitted.

PASS THE WORD YOU SERVE

Pabst BLUE RIBBON

Copyright 1939, Premier-Pabst Sales Co., Chicago
Students Have Bargain Golf

Students at Louisiana State University pay a dime to play 18-hole course with complete private club facilities

By M. A. McCalip

Louisiana State University is proud owner of one of the country's fine golf courses. It is one of the best 18-hole university-owned courses in the United States, and conspicuous because of the complete country club affiliation it offers the students. The L. S. U. G&CC presents a pleasant picture of management and operation efficiency to the rest of the golfing world.

The course, built in 1922 for the Westdale G&CC, was purchased by the university in October, 1936, for $25,000. Located approximately four miles from the university campus and one mile from the city of Baton Rouge, the plot includes 100 acres and is completely outlined with moss-draped magnolia trees and pin oaks, the trees being arranged alternately and 50 feet apart. The club is managed by John H. Sanchez, who supervised the construction of the course under the original owners.

Dime Fee for Students

The university purchased the layout to round out the school's athletic facilities and to make golfing possible for the students at about one tenth the cost students had been paying. This original purpose has been preserved through the cooperation of the university athletic dept. and the numerous non-university patrons.

(The club has 486 outside members, each paying annual dues of $25 for the use of the course and the club facilities.) Resident non-members pay a green fee of $1.00 while out-of-towners pay 50c. L.S.U. students pay a green fee of 10c. Rent charged students for a bag of clubs is 25c.

Instruction in golf is a regular part of the curriculum at the university. This training, embracing both the theoretical
and practical, is conducted by the physical education department and is attended by over 400 students. The practice on the campus is carefully supervised by Mike Donahue of the athletic department, who is assisted by a number of able student golfers.

At the conclusion of the preliminary training on the campus, the class is transferred to the golf course where further instruction proceeds under the tutorship of the club professional, Jimmie Cole. While undergoing instruction on the golf course the student pays only the regular green fee of 10c.

**Cushion Greens With Bagasse**

The course is kept well groomed at all times. All holes have two tees. The greens, of Bermuda, are topdressed once each month. Finely chopped Bagasse (the pulp and fiber remaining after the removal of the juices from sugar cane) which has been allowed to dry and undergo deterioration to a point where it is about half rotten, is sprinkled rather heavily on the greens before the topdressing is added. The Bagasse, being pithy and porous, tends to cushion the green and prevents rapid loss of moisture under a hot Louisiana sun. This method of treatment was developed by the club manager after several years of experimentation.

The course has a yardage of 6,321, par being 72. The longest hole is 585 yards, while the shortest is 122. The course includes three water hazards and numerous sand traps. On the front lawn of the clubhouse is a 9-hole putting course. The daily average of play throughout the year is 130.

Intramural and interfraternity athletics induce hundreds of students to participate in golf at L.S.U. each year.

Since the purchasing of the golf course, the university golf team has taken a most prominent position in tournaments throughout the country. Having won the Southeastern conference title numerous times, the team is also proud of the fact that its captain of a few years ago won the national intercollegiate meet. Other titles won by team members since the purchasing of the course include: runner-up in the national intercollegiate, Louisiana state championship, Canadian Amateur and Western Amateur championships. The prominence gained in the past few years has, no doubt, been due to a great extent to the excellent golfing facilities offered by the university.

In January of this year the physical education and athletic departments secured the services of Miss Joy McCann, well known in Southern golfing circles, to aid in the organization of a women's intercollegiate golf team.

**Other Sport Facilities**

Besides golf, the club facilities include six badminton courts with lights, two asphalt tennis courts with lights, and a concrete outdoor swimming pool. These facilities are open to students and members at no cost. The clubhouse is used for fraternity and sorority dances and banquets. A flat rate of $15 is charged for any university function. Meals and sandwiches are served in the clubhouse at all times.

The club is free of debt and operates on a paying basis despite the fact that some 8,000 university students are able to play golf at low cost.
Lime's Role in Fine Turf

By O. J. Noer
Agronomist, Turf Service Bureau
Milwaukee Sewerage Comm.

To most laymen moss indicates acidity, and soil in damp locations is considered "sour." These notions do not fit the soil chemist's conception. To him, prevalence of moss is indicative of impoverished soil and not sure proof of acidity. From tests he knows that soil in damp or wet spots is not necessarily "sour" or acid. Furthermore, even though lime is needed he emphasizes improved drainage as even more important.

Soils may be acid, neutral or alkaline. Modern practice is to express reaction in terms of pH. By that method the figure 7 represents a neutral soil, lower figures denote increasing acidity, and higher figures increasing alkalinity. Since each figure differs by a multiple of 10, pH 6 is ten times, pH 5 is 100 times, and pH 4 is 1,000 times, etc., more acid than neutral (pH 7). Similar differences apply in the alkaline range also. Soils usually fall in the range pH 4 to 8.5, but more commonly within the narrower limit pH 5 to 7.5.

Most plants grow best at pH6 to 8. However, some continue normal growth below or above these limits, and a very few require a more acid medium.

Among the commonly used grasses, Kentucky bluegrass, the rye grasses, and Bermuda grass are classed as lime lovers; whereas the fescues, red top and the bent grasses, can withstand appreciably more acidity.

Heavy Rains Acidify Soil

Acid soils develop in humid regions; that is, where rainfall exceeds 20-25 inches per annum. As surplus rain water passes down through the soil it dissolves and carries away some of the mineral soil constituents. Calcium is the principal basic element lost in this manner, so unless offset by applications of lime the tendency is for soil in humid sections to become acid.

The so-called physiologically acid fertilizers (sulphate of ammonia, etc.) accelerate the leaching loss of calcium and thus accentuate this natural tendency of soil to become acid.

During most of the decade preceding 1928, the use of lime on fine turf was frowned upon. Grass authorities attributed clover and weed invasion to its use, and a few went so far as to claim that bent prefers an acid medium. Following that disastrous summer it was realized that soils may become too acid, even for the more acid tolerant fescues and bent grasses, so the acid theory was no longer tenable and lime regained favor.

According to the present concept, the judicious use of lime is advised on acid soil. Although slight acidity is deemed helpful for clover and weed control, grass density is considered even more important. Weeds struggle to survive when faced with competition of dense vigorous turf.

One cannot judge need for lime solely by immediate stimulating effects on growth. Lime may help grass withstand drought and other unfavorable summer conditions, and tends to minimize some types of winter kill in the north.

By stimulating bacterial activity lime helps prevent accumulation of partially decomposed stems and leaves which may cause serious trouble in periods of hot weather when allowed to accumulate as distinct layers. Extreme acidity seems to have an adverse effect on the soil water relationship.

Soil reaction affects supply of available phosphorus. On acid soils applied phosphates gradually revert to relatively insoluble compounds. According to Truog the critical point is pH 6.2 to 6.5. Above this figure phosphates remain relatively available, but at lower reactions gradual reversion occurs. At reactions above pH 8.0 availability of phosphate is depressed also, but to lesser degree.

On very acid soil it is not necessary to apply sufficient lime all at one time to...
An interesting exhibit of tees is that on display at the Passaic County GC, Paterson, N. J. The collection was begun as a hobby by a member of the course maintenance staff and after receiving a good start, got additions from the course’s players. It makes a bulletin board, locker-room or lobby display that causes considerable comment.

raise soil reaction up to pH 6, or above. This may unduly favor clover, and actually depress rather than improve turf growth. The better and safer course is to apply a lesser quantity of lime, or at most twice a year until reaction reaches the desired point. After that use lime on greens annually at minimum rate, but the labor saving scheme on fairways is to apply enough lime at one time to last two to four years.

As a rule, finely ground limestone is cheaper than hydrate, and is the safer material to use. It can be applied all at one time without danger of burning the grass. Hydrate is caustic and hence may scorch the grass, so when rate exceeds 1,000 lbs. per acre it is safer to split the quantity and make two equal applications at intervals of 7 to 14 days. Heavier rates are permissible in late fall or early spring than during warm weather. In neutralizing value 70 lbs. hydrated lime are equivalent to 100 lbs. ground limestone.

Two Types of Lime

Based on chemical composition, there are two types of lime, so-called calcite and dolomite. The calcite type contains calcium only, whereas dolomite possesses both calcium and magnesium. The latter should be used where soil content of available magnesium is low. A dolomite containing 15 to 20% magnesium oxide, or its equivalent, should be selected. If not stated on bag this information can be procured from the producer.

Lime should be applied in fall or early spring. One advantage of fall is the fact that deeper penetration is likely because of more plentiful moisture, and the heating action of alternate freezes and thaws.

When used in spring, applications should be as early in the season as possible.

Where lead arsenate is used for grub control, it is best to apply needed lime several months before the arsenate. Lime tends to convert arsenate into a less effective basic compound. Likewise when phosphate is needed, best practice is to apply lime first, and the phosphate several months later.

For all practical purposes, need for lime on fairways and lawns is indicated when soil reaction falls below the following limits: Kentucky bluegrass, pH 5.5 to 6.0; fescues and bent grasses, pH 5.0 to 5.5; Bermuda grass, pH 5.5 to 6.0.

Soil type affects quantity required because less lime is needed on a sandy soil than on a heavy soil to produce the same change in reaction, even though acidity is the same at the start. All these factors are taken into account in the following table. Suggested rates are based on high quality finely ground limestone. If hydrate is substituted rate can be reduced one-fourth to one-third.

Suggested Rates for Ground Limestone on Fairways and Lawns

<table>
<thead>
<tr>
<th>Soil Texture</th>
<th>Degree of Acidity</th>
<th>Kentucky bluegrass</th>
<th>Fescue and Bent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sands and sandy loams</td>
<td>slight</td>
<td>1,000</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>medium</td>
<td>2,000</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>strong</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Loams, silt loams, clay</td>
<td>slight</td>
<td>2,000</td>
<td>None</td>
</tr>
<tr>
<td></td>
<td>medium</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td></td>
<td>strong</td>
<td>4,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

On greens need for lime is clearly indicated when reaction falls below the following limits: bent grasses pH 5.0 to 5.5; Bermuda and winter rye, pH 5.5 to 6.0.

When pH readings lie between these limits and neutrality, pH 7, the effect of lime should be tested on portions of one or more greens. Besides its direct effect on growth, enhanced ability to withstand drought and hot weather, increased immunity to disease, etc., are possible secondary benefits not to be overlooked.

Aside from soil pH, there are two other important indicators of need for lime on greens. When growth response to applications of ammonium sulphate ceases, need for lime is strongly indicated. Likewise, when disease is severe and control not easily obtained, lime may prove beneficial. This applies only when the growth factors are favorable and does not follow when greens are over-fertilized or over-watered.