Sixty lbs. to 80 lbs. pressure should be maintained in pressure tank and not less than 40 lbs. at hose connection at green. Keep pipe sizes large to prevent friction losses as much as possible.

Size of pipe depends upon pipe layout. If a "loop" system is used much smaller pipe can be used, but if not, start off with 4 in. or 5 in. and use nothing less than 1¼ in. pipe up to greens.

We have installed both river and well jobs, but cannot notice much difference in water's effect on greens. George Sargent, Scioto C. C., Columbus, likes well water. A drilled well would be best if plenty of water can be obtained from the ground as it does not cause trouble that happens when pumping from a river. If river water is used a good filtering system should be used and you will always have trouble with suction pipe getting full of mud, leaves, etc., which must be cleaned every season.

New England Plans Short Greenkeeping Course

A SPECIALIZED course for men engaged in the profession of greenskeeping, or members of greens committees has been arranged at the Massachusetts Agricultural College in co-operation with the New England Greenskeepers' Club. The subjects as outlined can be effectively studied during the winter months. Tuition charge is \$10.00. Registration fee is \$5.00. There will be no laboratory charges.

Applicants for this school must be members of the greens committee, greenskeepers, or must have had at least one year's experience on a golf course, and their application blanks must be countersigned by the greenskeeper and the chairman of the greens committee.

The number of students is limited to ten, and registration will be confined to citizens of Massachusetts until December 1, 1927. After that date, if there be vacancies, out-of-state students will be admitted in order of the filing of their applications.

All prospective golf students who indicate their desire to take this course, will be sent a regular blank for enrollment. This may be secured by writing the Director of Short Courses at Massachusetts Agricultural College, Amherst, Mass.

Courses offered include: Grasses and Grass Seed, Cost Keeping and Analysis, Fundamentals of Landscape Arrangement, Drainage, Motors, Water Systems, Soil Fertility, Equipment.

Ask Me Another By NOAH LOTT

Our expert answers two questions of general interest submitted to him. Send in your green-keeping problems; he'll be glad to solve them for you.

Question: Large patches of our fairways have died out in the past month, and on investigation we find there are thousands of grubworms just under the sod. They have eaten the roots of the grass. Of course, it is too late this season to remedy this condition, but if there is a cure for the trouble, we would like to learn of it.--(Iowa.)

Answer: Grubs raise havoc with the turf somewhere in the country every year, and accordingly the series of articles now running in GOLFDOM might well be condensed into a stock treatise for future reference. Fortunately, ordinary grubs differ from the grub of the Japanese beetle (on which the articles are particularly written) in that they are present in damaging quantities for one season only; for the next few summers, any particular piece of turf will generally be left alone.

Question: We are looking for a grass to sow in our fairways that will grow in our arid climate without watering. The usual sparse prairie grass grows on them in lumps, but the bare ground is exposed between the hummocks, so that a ball generally stops in a cuppy lie. Is there some kind of grass that will grow here? We hesitate to disturb the soil unless we can get something better.—(Montana.)

Answer: There has never been a turf grass found which would make a better growth under the semi-arid conditions of the country lying immediately east of the Rocky Mountains than the native sorts. The trouble is lack of water; with sufficient watering, any of the tame varieties can be grown. It would be interesting and valuable to experiment with small plots of several varieties of grasses, watering varying amounts and being sure to leave check-plots untreated for comparison. Your problem will have to be solved under the conditions prevailing in your climate; results attained in a humid region are of little, if any, value in your casē.

"Use Noodle on the Job"— Pat's Peddling Policy

J. A. PATTERSON, professional at the J. Griffith Park Municipal Golf Links, Los Angeles, is one of the pros who might be excused for raising a howl about department store competition, but on this subject you will find Pat care-free.

"Keep on your job aggressively and use your noodle alertly," is Patterson's advice, "and you'll have too much business to worry about the department stores cutting prices and flooding the market with a lot of punk golf goods. Bullheaded luck may make things break right for a while but the success that lasts only is attained by keeping hustling."

Patterson, like some of the other pros who are first class merchandisers, is in an exposed salient for the fire of department store competition because he is located at a public course. He has kept his sales constantly growing by being able to herd the sheep from the goats among possible buyers at his establishment. He defines this policy in stating, "I lay myself open to a lot of criticism from professionals when I state that so far as the department store bugaboo is concerned, it really is nothing to be feared as I deem the stores as essential to their type of trade as the pro is to the better grade of golf business. When the pro realizes the value of superior personal service and emphasizing upon his market the superior quality of his goods, the department store is very welcome to what's left in the golf business.

"What success I feel I have attained in my business, and I wish to emphasize the word "business," has been from the close personal contact with, and interest in, my customers, and the feeling that they are my friends as well as my customers. I have always tried to create the feeling that every piece of merchandise purchased in my shop is backed by a guarantee of perfect satisfaction and it is the polic7 of my shop that no piece of merchandise should be sold to my customers unless the salesman is satisfied that such merchandise is suited to the customers' needs."

In the last analysis the main stock in trade of any merchant is "service" and when the pros realize the vital importance of unselfish interest in their customers needs, and that the confidence engendered by that interest will develop into increased business and therefore profits, will the professional game be raised to the high standard it should attain.

Selling Research in the Shop Shows Up Dead Ones

W HEN the pro wants to learn whether some item in his stock is a seller or not, he can easily obtain this information by taking advantage of the well-known merchandising principle that, nine times out of ten, any article will sell better if well displayed than if stuck away on some shelf.

To make the experiment, place the article in question in some prominent position in the shop, where it must be seen by all who enter. The top of the showcase or alongside the cash or sales register are good spots. Print a small showcard with some slogan or other asking the members to buy. Arrange the goods to form an attractive display.

If the article sells with reasonable rapidity, the pro is justified in assuming it is an article that should be stocked at all times. If it fails to sell even when prominently displayed, it is a dud and the pro will do well to cut the price to almost cost and get his original investment out as rapidly as possible.

A "Fiddle" for Sowing Seeds



P. & A. Photos.

THE so-called "fiddle machine" is rapidly gaining in popularity as an efficient means of broadcasting grass seed over prepared ground. The seed fall from a hopper onto a rapidly rotating disc which is made to spin by working the bow as though playing a cello. Seeding can be done much more rapidly and even than by hand.



"The Hague" Plays Another Star Role as King of Clubs

Here's Walter Hagen at work in the L. A. Young Company plant at Detroit, Mich., with Sir Walter himself making the models for the new line of Hagen Ultra Clubs. Hagen's keen personal interest in the complete line of woods and irons bearing his name is shared by his corps of expert clubmakers who are working in enthusiastic accord with his developments in design and construction.





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Lippia Possible Warm Country Fairway Turf

BY PROF. P. B. KENNEDY, (Experiment Station, University of California.)

MAT grass is another name given to Lippia. The mat part of the name is appropriate but not the grass as it is not a grass but a verbena. Lippia is a good name. It is so named for August Lippi, a French traveler 1678-1704. The well-known lemon verbena shrub of gardens and greenhouses esteemed for its fragrant leaves is Lippia citriodora.

There is some confusion in the literature with regard to the common species of Lippia grown in California. The specimens we have observed in a wild state and under cultivation are the same. Yet our cultivated one is said to have been introduced by Franceschi into California in 1900 from South America. He calls his plant Lippia repens Hort. Bailey in the "Manual of Cultivated Plants" regards L. repens as a synonym of L. canescens and does not mention L. nodiflora yet in his "Cyclopedia of American Horticulture." L. nodiflora is recognized as being under cultivation and an annual with some qualms as to whether or not "annual" is correct. The California plants both wild and cultivated, are very distinctly perennial.

I am inclined to believe that the South American introduced plant is the same as our own species found near streams in open places along the banks. It is frequently subjected to floods for short periods during the winter and to more or less dry conditions during the summer. Such localities are frequently alkaline and yet Lippia seems to thrive as long as there is a little moisture present from seepage. The cold tolerance of the introduced or the native plant commonly grown in California is probably somewhere around 12 degrees F.

There are other species perhaps not yet introduced into cultivation, viz., L. lanceolata and L. cuneifolia that resemble our plant in their creeping habit but which must be more hardy as they are found growing in the colder parts of the west, the middle west and the east.

The Lippia now under cultivation is a low growing creeping perennial, rooting at the joints, with small bright green leaves and small short heads of rose-white flowers

extending a few inches beyond the foliage. It is quite frequently used as a lawn both in the hot interior valley and along the coast. Quite commonly it is used to cover steep banks not suitable for lawns. Lippia should be planted in the sun and not in the shade and given whatever water that can be spared. The results obtained will be commensurate with the attention given to it in the preparation of the soil, amount of fertilizer and watering.

On the other hand it may be called the lazy man's lawn plant as it can get along with very little water and practically no mowing.

With regard to what I think about it for golf, I would say that Lippia, including the hardy creeping species not yet introduced, has a good future more particularly for the fairways than for the greens.

The sod becomes closer, smoother and finer by severe trampling but if allowed to have its own way and not kept in subjection it has a tendency to become straggly and unsightly. I would not expect Lippia ever to produce so fine a quality of turf as our best golf grasses but it certainly has merit and is entitled to more consideration from greenkeepers, especially where they are confronted with sandy soil subject to saline or alkaline conditions.

Though Lippia can be grown from seed it is more difficult to get a stand by this method. For this reason seed is seldom available on the market. The customary and certain method is by division of the rooted parts in the manner of vegetative grass plantings. The catalogue price of the rooted cuttings is \$1.50 per flat or about \$10.00 per thousand. It requires about 300 plants to the square rod although double the number would hasten the formation of a sod. Sod may be obtained from a Lippia lawn divided into small pieces, and each piece planted 6-inches to 1-foot apart each way.

Lippia is more or less dormant in the winter and is inclined to brown slightly with the frost. On the approach of spring it greens up rapidly and revels in the heat with an occasional watering.

The little nobs representing the blossoms are not attractive from a lawn standpoint but these can be very easily eliminated by setting the mower high and cutting off the blossoms every two or three weeks during the flowering season.

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Some Notable Drainage and Watering Jobs of 1927

Detroit Masonic Country Club, Detroit, Mich. New Westwood Country Club, St. Louis, Mo. Poland Country Club, Youngstown, O. Westmoreland Country Club, Pittsburgh, Pa. Brookside Country Club, Columbus, O. Virginia Country Club, Long Beach, C Cal. Glenview Country Club, Chicago, Ill. Phoenix Country Club, Phoenix, Ariz Ariz. A. D. Lasker (private course), Chicago, III, Milburn Country Club, Kansas City, Mo. Colony Club, Detroit, Mich.

All of these jobs (and a number more) were handled by Wendell P. Miller, and we have a right to boast of them, as the clubs will tell you. Consider the character of these clubs, and bear in mind that there's a generally over-rated idea of the cost of drainage and watering.

Talk your situation over with us. There's no charge or obligation for a consultation.

WENDELL P. MILLER **Golf Engineer**

85 East Gay St. - - Columbus, Obio 664 N. Michigan Ave. - - Chicago, Ill.

Improved Tee Remodel on Economic Unit Plan, Advises Egan

CHANDLER EGAN, who as player. · architect and counsellor to countless club officials who have run to him "when a feller needs a friend," ranks as one of the country's most helpful golf notables, has been good enough to favor GOLFDOM with some valuable advice for the guidance of clubs intending to remodel.

Mr. Egan says:

"I find it difficult to go at all into detail because of the thousand and one conditions to be met. When a mother says, 'Johnny, go wash behind your ears!' the remark is obvious, trite but nevertheless sound advice. So, because it is sound advice I am going to risk the following remarks.

"In the last analysis every golf club wants its course to be the best that can possibly be had with the given conditions. I believe that any golf course that needs it can be so remodeled that it could last for a long long time without anything in the nature of reconstruction being done to it -witness the old course at St. Andrews, Scotland, even through the great change in the game brought about by the modern ball.

All golf architects agree on the two main essentials of a perfect golf course for a given piece of land. One is the scientific placement of hazards, both natural and artificial, and the other is the blending of all artificial construction so that it may appear as natural as possible and enhance rather than detract from the natural beauty of the landscape. One can see many holes that are perfectly trapped and which have a green with an ideal putting turfand yet the hole lacks the supreme delight of beauty. A little remodeling of the edges of the hazards and a softening of the contours of the green without changing the position of anything and the ugly duckling has become the Bird of Paradise.

"Few golf courses in this country can come up to such a high standard but what the thought of reconstruction or remodeling to a greater or less degree must come before the minds of nearly every greencommittee and Board of Governors. Obviously, any work that must later be done over is a waste of both time and money so that in the long run it is more economical to have the work done right the first time.

5 ft.

long

I should, therefore, suggest the following procedure.

Economic Unit Plan

"1.—Employ a really competent golf course architect to make a complete survey of the situation and supply a map and working drawings or models of the work to be done.

"2.—Let the golf architect, in co-operation with the greenkeeper and the green chairman divide the work into economic units. Very often it is cheaper and simpler to do part of the final plan on two holes that are adjacent than to do one hole as a unit. An architect usually finds plenty of opportunity to use dirt from an excavation; but it may be wanted on another hole than the one where the excavation is made, or it may be advisable to use it there because of a possible shorter haul.

"3.—Let the Board of Governors with the green chairman arrange the budget if possible so that one or more of the units can be completed each succeeding year. Perhaps the first year's budget will only take care of the architect's fee. If so, it will be money well spent.

"4.—Be sure that the greenkeeper not only knows his job as to soils, grasses and fertilizers but also that he is capable of satistfactorily interpreting the drawings or models of the architect so that they may be faithfully reproduced. This is almost more than half the battle. If he is not competent to do the work alone, don't have it done unless someone able to supervise it properly can be employed.

"Beyond the above four points the rest is a mass of detail that must be worked out by the architect, the green chairman and the greenkeeper to meet local conditions."

Chicago, Ill.—Greatly increased business in Caterpillar tractor sales in its northern Illinois territory has compelled the W. B. Louer Co. to move into bigger quarters at 431-35 South Jefferson St. The new establishment has big display space and one of the finest and most complete service and parts facilities of any Caterpillar dealer.



USE YOUR EYES

That's all you need to do. Go to the nursery and see for yourself what you are getting before your greens are planted, without your knowledge, to a mixture of dandelions and weeds.

Maybe you think Bent is some kind of magic plant that just naturally grows itself, all clean and fresh and fine. Well, it is not. It takes every care and attention to produce the right kind of Bent for your golf course or any other golf course.

So see what you are getting. Ask whose Bent is going on your course, where it is grown, and then go and look at it. Then take a look at our nursery and we will abide by what your eyes tell you.

Don't blame anyone if you get stung in the Bent that goes on your greens. It's your own fault if you buy the worthless planting stock. Claims and hot-air mean nothing—SEE THE NURSERY STOCK YOURSELF.

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Lightning Explanation Seems Reasonable

BY CARL H. HENRIKSON,

Y. M. C. A. Kish-wau-ke-toc Golf Club, Williams Bay, Wisconsin.

GOLFDOM'S illustrations and accounts of greens being struck by lightning have interested me.

This may explain the phenomenon. The electricity in lightning bolts usually finds its way to the water table via trees. through the roots and the capillary tubes of the earth. During dry seasons there is not enough moisture in the capillary tubes to make good electrical conduction. Greens are kept watered throughout the dry season and the water soaks far down into the ground; consequently there is better conduction through the green than through the trees and roots even fairly close to the greens. Lightning will take the line of least resistance, which is the line of best conduction, and may strike greens during dry seasons.

Knowing this to happen, it might be wise to stay away from greens during an electrical storm.

Tractor Cuts Greenkeeping Payroll 30 Per Cent

H ARVEY M. BURTNETT, manager of the Mount Hawley Country club Peoria, Ill. is a strong believer in effecting economies in course maintenance by displacing manual labor and testifies to the success of his policy in telling of the performance of a 2-ton Caterpillar tractor at Mount Hawley course.

Burtnett states, "a 30 per cent reduction in our payroll has been made possible by the use of our Caterpillar and we are so convinced that the tractor will permit us to depend entirely on gasoline power for our work that we are going to sell the one team of horses we have left.

In outlining some of the work done by the Caterpillar, which is equipped with rubber tracks, he relates:

"Undoubtedly the heavy rains which occurred this last spring would have prevented our carrying out any early maintenance work if we had not had the advantage of being able to use our tractor. The large bearing surface was an assurance of protection against destruction of the fairways, but at the same time perfect traction was afforded by this type of construction—the result being that in spite of unfavorable weather conditions our tractor was on the job earlier than could have been possible with any other similar type of equipment.

"The versatility of the tractor permitted an unlimited range of maintenance and construction work—mowing fairways, doing top dressing work, maintaining and building bunkers and tees, clearing grounds of hedges, stumps and needless trees, maintaining our road into the grounds and numerous other chores incidental to golf course work.

"The course yardage is 6,356 and not less than 95 per cent is under mower cutting. This is covered with the Caterpillar and a five-section mower in nine hours, as compared with four or five days under former methods.

"The tractor efficiency effected in handling top-dressing was nothing short of phenomenal. The Caterpillar and a oneyard scraper handle 60 yards in a ninehour day—an operation which is necessary every thirty days. Two men handling the entire equipment on a quarter mile haul average eight minutes to the trip, as compared with our old method which limited us to 18 or 20 yards per nine-hour day

Minocqua Solves Cooking and Caddie Problems

Based on an Interview with O. E. Heisser, Secretary-Managing Director Minocqua Heights (Wis.) Country Club

Because Minocqua is far off the beaten track, Mr. Heisser had some special problems to face. How he solved them is told below.



E XECUTIVES of country clubs may say with perfect truth to their friend, the hotel man, that if the hotel men will take their hotels out in the woods away from the labor supply and away from modern city conveniences and still run hotels with standards of service as high or higher than they were in town, then the hotel man will begin to have a new concoption of the ease of his own job.

Two details of the management job at the isolated country club sharply show the 'ifficult character of the country club manager's work; the operation of the kitchen and the supply of well trained caddies.

A good example of how these problems are solved comes from the excellently managed Minocqua Heights Country club where O. E. Heisser is the presiding power.

The Minocqua Heights Country club, which is situated on Minocqua lake and near the northern Wisconsin town of that name, has been organized for five years and on its membership rolls is the largest list of names of any club in that part of the Badger state. The membership is of an exclusive character. This region is popular with prominent Chicago families as a summer residence, their summer homes being adjacent or near the club so that 96 per cent of the Minocqua's memhers also hold membership in prominent Chicago clubs. Heisser has instituted several innovations which have proven popular there and describes some of the different problems they have been confronted with due to the sparsely settled country and the climate which are at once reasons for the popularity of the club as well as for some of the handicaps to easy operation.

Scouts as Caddies

"Like other clubs," said Mr. Heisser, "we had our troubles in getting good caddies. Not only were we up against the caddy personnel problem which bedevils every person charged with the management of a golf club; but boys of any kind were hard to find up here. The number of boys per square mile was not only amazingly low but those boys who were suitable in all other ways lived at such a great distance from the grounds that they had the greatest difficulty getting to and from their jobs. If they walked over in the morning, they had already walked the equivalent of two rounds and the edge was off-they lagged and their eyes did not follow the flight of the ball.

"We decided to go after the number and kind of caddies we wanted and after talking our needs over with the officials of the Boy Scouts organization, we found that they could supply us if need be with whole troops of boys who were of the proper age and physique and moreover who were amenable to discipline and eager to have a summer vacation in the northern woods in surroundings that would be of the best

"So we provided quarters for 40 Boy Scout caddies and they are housed and fed right on the club grounds. They are at hand early and late as needed, although their hours are carefully worked out so that they get the rest needed by boys of their age. They are managed and provided for as well as they would be at any boys' summer camp of the highest standing and of course they are earning money during their vacation period."

Kitchen a Problem

Practically every club has problems in its kitchen. The situation is that of a

GOLFDOM





The dining-room is spacious and cheery.

first-class hotel moved out into the country and the club management faced with keeping up not only the comforts but the luxuries of life as well. Golfer's appetites are whetted to a fine edge and the food must not only be well prepared and properly cooked, but it must be served with dispatch—with a minimum amount of elapsed time between the moment that the order is given and the moment the steaming dish is set before the hungry diner. What the irate chef may say when things go wrong because of equipment handicaps matters not to the dining hall patron; likewise the spleenatic comment of guests with unrequited appetities seldom reaches, first hand, the monarch of the pots and pans; but both sides file their briefs in staccato accents in the front office.

But not at Minocqua Heights.

There the kitchen has complete modern facilties. Water is under pressure in the taps; electricity is available for light and also for power machinery. But perhaps the distinguishing feature in the service quarters is gas, the last of the public utilities to be individualized for use in the country.

"We have gone a step farther than most clubs," stated Mr. Heisser, "and our kitchen is completely equipped with gas appliances even though we are miles from the nearest gas main. So far as I know, Minocqua was the first to take such a step. We use bottled gas from the Illinois Bottled Gas Co. of Chicago exclusively in our

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Poa bulbosa, a winter green grass for the South. Warehouse, Coquille, Ore.

