

how good an employee is, he cannot turn out a good shop job if he is cold and damp and has poor tools to work with. I believe the simple requirements can be supplied by the average golf club if a program is instituted and incorporated in the budget on a 5-year plan. The efficient operation of golf course equipment begins in the repair shop.

GSA Convention paper.

Postwar Maintenance

(Continued from Page 42)

mately \$13.00 per acre for the chemical; this is the 2,4-D in Carbowax, and used it on our No. 1 fairway at Skokie Playfield. Commencing at the green and working towards the tee we sprayed the compound at the rate of 10 pounds per acre in 200 gallons of water. We were advised after treating approximately one-third of the fairway to make the application at the same rate but to use only 100 gallons of water per acre. Approximately three-fourths of the fairway was treated on September 5th, the balance on September 17th, rainy weather and other work preventing us from completing the treatment before that date. An inspection on November 1st, showed approximately 90 percent of the dandelion and plantain eliminated.

As an experiment, we treated clover patches on a couple of the greens, mixing a solution at the rate of one-half ounce of Weedanol to 1½ gallons of water, spraying the clover patches to a sufficient degree to make certain that all the clover was thoroughly wetted. Two treatments were given, one on September 17th, the second on October 3rd. A considerable damage to the clover was noticeable immediately following the first treatment with no damage to the bent. At the time the second treatment was applied the clover showed some evidence of recovery. An inspection on November 1st showed that there was approximately a 100 percent kill of the clover leaves and approximately a 70 to 80 percent of the runners with considerable burning of the bent grass on the green.

Note the difference in rates—in one case the rate applies to pure 2,4-D, in the other the rate for the manufactured product.

We sprayed a burdock in the early summer using Weedone. The burdock at the time of spraying was approximately 3 feet tall. It took this chemical all summer to kill the burdock; the battle was interesting to watch.

Our experiments last summer show that 2,4-D is sure death to poison ivy and Canada thistle.

March, 1946

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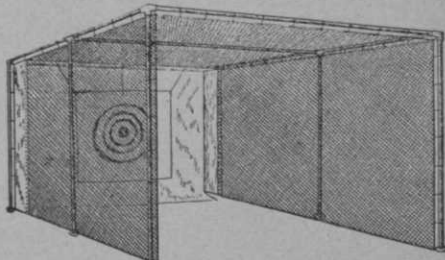


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Remember Wartime Lessons

(Continued from Page 12)

about having fun out of the game. It may be a delicate psychological problem in some cases, but I haven't found it so.

The wartime experience of thinking of golf as beneficial treatment of an important customer reminded me there's a big peacetime income for me in being known as a pro who teaches older businessmen to thoroughly enjoy golf, just as there is for me in being known as a pro who can teach younger people to achieve the limits of their scoring possibilities. There's a tremendous market of new young players coming along to warrant the pros' most cordial invitation and efforts, but there's still a fortune for pros in the older men and women.

Wartime work away from golf gave me, as it did other pros, opportunities to check my own business judgment against that of men in industry. In war work I confirmed as good practice, some of the ideas I'd applied at Claremont, and picked up ideas I could apply to management of the pro and course job.

Check Maintenance Equipment

One thing I'd done before the war proved to be especially valuable in wartime. When I'd taken over the course management job in 1937 I made a deal with an expert mechanic on a retainer fee basis. Saturday afternoons, when the course men were off, he'd come around and check up and repair our equipment. The retainer basis also had this man quickly available when we needed repairs. It reduced our repair bills well under what one could consider a normal amount and prevented waste of time with out-of-service or faulty-operating equipment.

This arrangement of having a competent specialist worked out very well, and I recommend it to other clubs if they can get the right sort of a man. Once, when a tractor took fire on the course, our repairman rushed out to the job and repaired the tractor while it was still hot.

The services of an expert seemed to me to be necessary with us having 13 pieces of mechanized equipment on course work. The investment represented, and the work to be done, is too important to be made the responsibility of a jack-of-all-trades, although the ingenuity of veteran greenkeepers in repairing equipment is infinitely greater than most members of green chairmen realize. Another place where this expert's services were highly valuable was in helping us compile a list of repair parts we should have in stock. By having those parts ordered and in stock before the war we saved ourselves much in actual cash and in headaches.

A real life-saver for our operation during the war was Claremont's policy of paying its maintenance force the year

around. We have a grand team of veterans with us, headed by Luigi Galletti, who's been Claremont's foreman for 37 years. He and I have worked together at the club for 19 years. I've known a lot of fine able gentlemen with whom I've played golf or otherwise served as a pro, and many splendid men in the various business branches of this game. But I've never known a finer one than Luigi.

And there's another thing I learned from war work; to have fullest appreciation of the fine work done by a pro's associates at a club and not be backward about expressing it.

These old-timers of ours on the course never have had to ask for a raise. The latest raise our men got in wartime had to go through government channels, but the club got it. Our club is smart that way. Claremont's officials are looking for economies that good men effect by their faithful, intelligent and alert performance. By being vigilant and having the policy of rewarding the men for this sort of attitude and performance Claremont has given itself a deserved reputation of being a fine, square outfit to work for. That's something where much can be done in golf as in other businesses.

Cooperation

Frankly—and I hope you won't think I'm taking any bow for this mutually profitable labor relations policy—a reason for the keen appreciation of the work of our outside men is because our committees count me in on the meetings. The committee members can't get around and become intimately acquainted with the problems and performances in work on the course and clubhouse grounds. I'm paid for being their representative, reporter and advisor in that task. It is no easy job. But it can be done very helpfully along with pro department duties, when one manages his time thoughtfully and when he has justified the confidence of his committee men.

In that contact between management and labor we at Claremont have a better arrangement than it seemed to be possible to get in war industry.

The hiring of a mechanical expert was one result of that close and understanding contact between committees and the men responsible for the maintenance work at Claremont. Another retainer basis arrangement that has worked out with decided mutual satisfaction was that of retaining Prof. Harry Shepard of the University of California horticultural dept., as our flowers and landscape advisor. He worked out and supervised a program that gives us more flowers, the year around, for less labor and less money than we'd ever thought possible.

We have a huge 3-story clubhouse in which there are members' living quarters.

Our mgr., Tom Sherlock, insists—and to the great delight of our members—that flowers be bountifully used in making Claremont's clubhouse bright and fresh. Tom can tell other managers how such expert service as Prof. Shepard has given us has been a decided factor in keeping down costs of interior and exterior decoration of a clubhouse.

These points of our own operation, as compared with my observations in war industry, I review as I try to figure out just what we can do in making the post-war period by far the most satisfactory years Claremont ever has had. As Claremont benefits, my own income and satisfaction increases. But, like any other pro who's learned this business over a good many years of trial and error and study and work, I can't ever become so satisfied with the operations of my own department that I can hesitate to change as conditions may dictate departure from practices I've followed.

"Why We Hired Horton" Told By Detroit GC Official

★ Victor A. Olsen, chm. of the Detroit (Mich.) GC special committee appointed for hiring a pro to replace Alex Ross who resigned, released to newspapers a statement many pros will find interesting. Olsen said, in part:

"In making our selection of a new professional for the Detroit GC we considered a large number of applicants, but Horton Smith seemed to have the highest degree of the desired attributes. He was the only one to whom the position was offered. Just as was the case when Alex Ross was employed 30 years ago, we thought the club membership as a whole was entitled to have the best professional obtainable. One purpose was not to employ a "namepro" who would have little to offer the club but his name. We wanted a man who would be a perfect gentleman under all circumstances; who is himself an outstanding golfer that will inspire the confidence of his pupils; who is a good instructor, thoroughly familiar with all up-to-date golf technique; who is young enough to be active for a good many years to come, but old enough not to be bitten by the desire to follow the tournament trail; and who will make his position with us his primary professional interest. Horton Smith seemed to perfectly fit our requirements, and we are sure our entire membership will be very happy that we have been able to engage him, particularly after they come to know him through the coming season."

NEED BUYING HELP? SEE PAGE 83

March, 1946

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Controlling Turf Destroyers

(Continued from Page 22)

may in the future replace lead arsenate for the control of sod webworms and cutworms on golf greens and other turf.

3. Federal entomologists, working with the Bureau of Entomology and Plant Quarantine have found that the Japanese beetle in both adult and larval stages is very susceptible to DDT poisoning. However, since the excessive use of DDT on trees and shrubs in making soil treatments may prove injurious to birds and other forms of wildlife, the general use of DDT for the control of the Japanese beetle and similar pests should await receipt of sound recommendations by competent authorities.

A number of other new insecticides, including benzene hexachloride, sabadilla, Ryania, Rothane and Velsicol 1068 which are now in the hands of many research entomologists may in the not-too-distant future in part replace a number of old insecticides, perhaps including DDT in some instances.

Rodent Control

The writer, being an entomologist with extremely limited training and experience in the field of rodent control, ventures into this phase of the subject with not a little hesitancy and reluctance. While the suggestions that will follow are based upon experiences and observations made over a period of years in Iowa, perhaps you will do well to verify or correct any comments that are made by contacting authorities on the subject of rodent control in your respective states or the Fish and Wildlife Service in the Department of the Interior. The rodent pests most likely to be encountered on the average golf course include ground squirrels, pocket gophers and groundhogs. Moles, although not true rodents, are included for good measure.

Trapping, shooting and drowning are methods often employed for reducing ground squirrel populations. These methods are successful if followed persistently, but if used intermittently they will tend to make the ground squirrels wary and result in scattering the population.

Poison bait can be used successfully in controlling ground squirrels on a large scale. With baits it is possible to poison most of the burrows and thus kill a large percentage of the squirrels at one time. Shelled corn or oats soaked in a solution of strychnine (1 oz. of strychnine sulphate in 2 qts. of water) are frequently used for this purpose. Grain poisoned in this fashion should be scattered around the entrance to the burrows and should never be placed out in piles where it may be picked up by other animals.

A number of fumigants including carbon disulphide, calcium cyanide and carbon monoxide (from the exhaust of an automobile or other gas engine) may be used to kill the squirrels in their burrows. In some ways the use of fumigants is more satisfactory than the use of poison bait since the fumigant penetrates to the very bottom of the burrow and usually kills all animals present. Furthermore, the possible danger of poisoning birds and animals through the careless use of bait is eliminated. In fumigating with carbon disulphide a wad of cotton or waste is saturated with the liquid and stuffed into the entrance of the burrow. Calcium cyanide either in granular or dust forms may be introduced into the burrow with a long-handled spoon or by means of a cyanide dust gun. In using car exhaust gas, attach a length of garden hose to the exhaust pipe of the automobile and insert the other end of the hose into the burrow. With any fumigant it is desirable to close the burrow entrance with a piece of sod or a quantity of moist soil following the introduction of the fumigant.

For those who are willing to spend the time required to develop the art, trapping is a very successful method of handling a small gopher problem. The most successful method of controlling pocket gophers on a large scale, however, involves the use of poison bait. Since the pocket gophers feed on the roots of plants, cut carrots, parsnips, turnips, sweet potatoes, Irish potatoes and other vegetables may be used as bait. To prepare a suitable bait, cut the vegetables into pieces about $\frac{3}{8}$ inch square and 1 to 1½ inches long. In preparing the bait it is important to get the poison evenly distributed over the individual baits. To do this, mix 1/16 oz. of powdered strychnine alkaloid with 1 tablespoonful of ordinary kitchen flour. Place the freshly cut bait in a paper sack and sprinkle one half of the strychnine-flour mixture over the bait. Close the sack and shake it vigorously for about one minute. Then add the other half of the poisoned flour mixture and shake again. In this way an even distribution of the poison over the bait is reasonably assured. As soon as the poison is applied, the baits are ready for use.

Since the pocket gophers seldom if ever leave their burrows beneath the surface of the soil, the baits must be introduced into the runways. A three foot section of broom handle pointed at one end makes a very useful probe for locating runways, and a probe of this size makes an opening large enough to permit dropping the bait down into the runway. The bait should be dropped into the main runway which can easily be located by observing the position of the high point of the mound. As a rule, the high point is near one edge of the mound and usually the mound is flat in-

stead of round at this edge. The main runway is usually from 10 to 16 inches away from the flat side of the mound. When the runway has been located and probed, two or three pieces of bait should be dropped into the burrow and the probe hole carefully closed in order to prevent the entrance of light.

Groundhogs seldom present a serious problem on open golf courses, but at times they may move in and construct dens in the banks of streams, bunkers, terraces or a grade cut. The presence of a few groundhogs may add a new spark of life and interest to the course and their destruction would be unwarranted. However, when their presence is objectionable they can be easily destroyed with any of the fumigants recommended for the control of ground squirrels. As a rule 2 teaspoonfuls of granular calcium cyanide, tossed into each entrance to the den will do the job. All openings should, of course, be closed with soil or sod to seal the gas in the den. During the summer and fall months groundhog burrows may be inhabited by any one of several harmless or valuable fur-bearing animals. Therefore, in the interest of protecting these animals, the fumigation of groundhog dens should be restricted to a short period in the spring when the young are still with the parents and there is little likelihood of other animals entering the den.

Several different species of mice inhabit permanent grass sod in open fields and semi-timbered areas. Frequently meadow mice and perhaps other species become serious pests in young orchards, nurseries and valuable landscape plantings where they may do considerable damage by breaking and girdling young trees and shrubs.

Specialists in the U. S. Fish and Wildlife Service have developed a bait and a baiting technique that will give excellent control of these pests. Anyone interested in the control of field mice can obtain instructions for preparing and using the bait by writing the U. S. Fish and Wildlife Service.

Unlike rodents, moles live chiefly on earthworms and insects that inhabit the soil. To the extent that they destroy harmful insects, they are beneficial and might be protected were it not for the fact that the ridges and mounds they produce often disfigure or damage lawns, fairways, and even greens.

Several methods for catching or destroying moles have been suggested, but since all of the methods involve tedious painstaking effort and none are completely or outstandingly effective, it is only natural that we find some difference of opinion as to the best or most effective procedures. Trapping the animals with specially designed mole traps is perhaps

the most widely used method. Some operators with a thorough knowledge of moles and their habits develop considerable skill and find this method eminently successful, while others have grave difficulty in catching even a single mole.

Where hose connections are available, moles may be drowned out by flooding the runways, especially during April when the young are most likely to be in the nest and cannot escape. Some gardeners, while working in the vicinity of mole runs can detect the movement of the moles just below the surface and quickly throw them out with a shovel or fork. Systematic fumigation of the runways is often very effective. In fumigating, all of the runways should be treated at the same time, and this method will prove most effective if the fumigant (carbon disulphide, calcium cyanide, or carbon monoxide) is introduced into the runway at intervals of not to exceed 8 or 10 feet. Since the moles, on detecting the first trace of gas, may quickly construct a soil dam in the burrow, car exhaust gas and calcium cyanide dust blown into the burrows with some force are more effective than fumigants that have to move through the burrows by diffusion. Several years ago the late W. P. Flint of Illinois observed that moles were seldom present and would not persist in soil treated with lead arsenate. Whether the moles are killed by eating poisoned insects and worms or whether they are forced to move out of the area in search of food is not known. This observation is worthy of note, however, and may well deserve thoughtful consideration.

During the war at least two new rodenticides, Antu (alphanaphthylthiourea) and 1080 (sodium fluoroacetate) were developed primarily for use in rat control. Both materials have received considerable publicity and may eventually be extensively used for the control of rats and other rodents. For the time being, however, red squill is perhaps the best material to use wherever there is danger of poisoning wild or domestic animals.

Paper read at GSA Educational Conference.

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Better Bent Strains

(Continued from Page 14)

abuse. It has been more widely tested on golf courses in the Middle West than any of the other numbered strains. Under central Iowa conditions, it is fairly resistant to disease, but brown patch is sometimes serious. Just north of Des Moines, Clarence Yarn who owns and operates the Woodside Golf Course has C1 greens which are 10 or 12 years old. The course is on timber soil and the greens are placed in a great variety of locations with respect to soil drainage, air drainage, etc. For the past 4 years, the course has been closed. Yarn has maintained the greens with the minimum of care. He has not applied fertilizer nor fungicides during the past 5 years. These greens as we observed them in October, 1945, were in surprisingly good condition. Yarn believes that C1 is the only bent capable of living through with such treatment and that C1 is the best bent grass for the average greenkeeper because of its generally superior performance. In the turf at Ames, C1 has rated among the top 3 grasses year after year. On the Iowa State College course, 4 greens of C1 compare well with the best greens grown anywhere in Iowa. The other 14 greens are covered with Washington. As a general statement, it can be stated that C1 has under midwest conditions, proved to be a valuable bent grass. There are one or more greens of C1 on a number of golf courses in Iowa and it is our considered opinion that in the future, more of it will be used rather than less.

The college golf course at Ames is a scenic and colorful 18 hole course. No. 1 green, alternate, was built in 1939, in cooperation with the USGA Greens Section and the Experiment Station. Twelve strains of bent were used in the construction of the green,—a typical pie-shaped test green. The bent grasses consisted of C1, C51 (Metropolitan), C36, C19, C27, C17, C28, C15, C7, C52 (Old Orchard),

C50 (Washington), C32. Originally there were 3 seeded segments, all of which did so poorly that they were replanted with stolons of C27, C28, and C32. This green has been maintained in the same way as the other greens on the course and is usually in excellent playing condition. In September of 1943, 1944, and 1945, members of the Iowa Greenkeepers Assn. graded the 12 segments of this No. 1 green with the following results:

A summation of the collective judgments of the greenkeepers in September of 1943, 1944, and 1945:

	1943	1944	1945
1.	C51 Metropolitan	C28	C19
2.	C19	C19	C52 Old Orchard
3.	C28	C1	C51 Metropolitan
4.	C1	C51 Metropolitan	C15
5.	C27	C32	C1
6.	C32	C52 Old Orchard	C27
7.	C15	C27	C7
8.	C52 Old Orchard	C15	C50 Washington
9.	C50 Washington	C7	C28
10.	C7	C50 Washington	C36
11.	C36	C36	C32
12.	C17	C17	C17

The collective judgment of greenkeepers may perhaps be a fairly reliable index by which to judge these bent grass strains, but it should be pointed out that the greenkeepers themselves in their placings, vary tremendously. They do, however, on the average, agree fairly well in their selection of the top 3 or 4 bent grass strains.

Now as to the prospects for improved strains of bent grasses.

The two well known methods of covering a green with bent grass are by seeding or stolonizing. In the middle west, stolonized greens are by far the most popular for the reason that stolonized greens are uniform in color, growth and in their behavior during the extremes of summer

This small power sprayer with a 6 nozzle boom delivered 2½ gallons per minute at 275 lbs. pressure. The spray is delivered as a fog-like mist. This outfit covered one acre in 20 minutes.



heat and winter cold. In Iowa, the most widely used bent grass is perhaps Washington followed by Metropolitan and C1. With the "know-how" possessed by greenkeepers, these strains produce beautiful results. But we are not satisfied. Each of these popular strains have to be watched continually during the entire growing season and steps taken to protect them against brown patch and dollar spot. Disease control is costly in terms of fungicides and the labor needed for their timely application. A bent grass free or more resistant to disease than the common varieties now used would obviously be of extreme value under our conditions. Were diseases easy to control, we perhaps could be satisfied with the present varieties.

Bent grasses are heterozygous in their genetic constitution which simply means that they are of mixed origin. It is here that the hope of improvement lies. Seedlings of bent grass are variable in many characteristics. They vary in vigor, color, texture, hardiness and in disease resistance. The problems of breeding, selection and testing are problems for men trained in the sciences involved. The Greens Section has made notable progress and is to be commended for its work in selecting, testing and the introduction of such excellent varieties as Washington, Metropolitan, Old Orchard and C1.

Fertilizer Development

(Continued from Page 38)

concentrated materials containing 79 units of plant food.

During the past year the writer has made several applications of high analysis granular materials to lawns. It has been possible to apply as much as 40 pounds of nitrogen per acre, even in the heat of summer, with such materials without either watering in or bad discoloration to the grass. Such materials would hardly be practical on greens unless immediately dissolved by thorough watering.

It is not improbable that the miracles attributed to soil-less culture and the materials which have proven this method commercially practical on high value greenhouse crops, may point to a definite future trend in fertilization through utilization of complete nutrient solutions. Altho such developments in fertilizer practice would not surprise me, wide acceptance of new theories will be gradual. Still golf courses were among the first to use soluble materials applied by various types of proportioning devices and I personally look for their increased use in the years immediately ahead.

In our haste to adopt new ideas we dare not lose sight of the importance of organic matter, the life of our soils.



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By **WILLIAM F. GORDON**

Wm. F. Gordon & Co., Golf Course Construction Engineers

Having specialized in golf course construction engineering since 1920 I would like to make a few observations and pass along some of the information I have picked up through the years.

One of the basic facts, and one of the first considerations in order to get a satisfactory golf course is to secure a suitable piece of land over which to lay out the course. It is customary for a committee to buy land and then call in an architect. If a committee lacks the engineering knowledge which would qualify them to cope with the engineering problems of design, construction and maintenance it is apt to buy land without thought to the practical difficulties involved. Often a layout on such a site may involve a greater expenditure than one on some other advantageous piece of property. The question of whether there is a good water supply on the property available is a very important one, and too, subsequent maintenance after completion may be higher due to hilly topography where hand labor replaces machinery and many other details.

These are things on which you can consult your architect. Therefore, I would suggest where possible to call him in before the ground is selected and purchased.

Secure the best architect and the best construction engineers available. The two are an entity that is absolutely essential. This combination is your best insurance toward getting a fine course. The two working together can sometimes save you a great deal of money. A good combination exists when an architect is associated with engineers who have an organization trained in the science of golf course construction. It is possible from their past joint experience for this kind of combination to effect many economies in their line of work. A contracting engineer who knows the architect's work can get your course completed in the shortest possible time with a minimum of change.

One of the facts the committee must face, and cannot get away from, is that a good golf course costs money. I say from long experience, do not stint on your course construction. Your course will reflect upon completion, how it was built and what was put into it. Therefore, in giving out a contract be guided by the past experience of the engineer you select to do the work for you.

Be wary of estimates. I would like to stress here that in many instances an estimate is just that—an estimate. Many a club has been misled by an estimate only to awaken at a later date to the realization that they must refinance to complete the work.

I like a lump sum contract. Here the committee knows exactly how much the course will cost to complete. The club can ask for bids on specific plans and specifications, furnishing sets of these plans and specifications to each bidder. Stipulate that bids are to be sealed and set a definite time and date for the opening of the bids. Request that all bidders be present when bids are opened and award the contract to the lowest qualified bidder. Require bidders to furnish bid, performance and completion bonds. This last I believe to be fair to the reliable man who can really build your course for the amount stipulated and eliminates the unqualified contractor who may take the contract for less and when half through finds he is unable to finish the work for the contract price. This has happened in a great many instances. The completion cost then is higher than some of the original higher bids to the detriment of the work and sometimes with a great loss of time. The bid, performance and completion bonds do away with this. You are assured that your course will cost the figure agreed upon, and only that.

A reliable course construction contractor usually can complete a course in from 2 to 3 months. It is purely a matter of experienced efficient organization and good equipment. As a protection to the contractor the club should furnish a certified financial statement and set aside sufficient funds to guarantee payment.

Major Construction Items

The major items of construction are as follows:

CLEARING-- Removal of trees, stumps, brush, stones, hedgerows, etc.

DRAINAGE — Springs, ponds, swamp area, streams and ditches.

GRADING — Sub-grade greens, tees, bunkers, fairways, rough areas and top-soiling.

WATER SYSTEM — Pipe lines, pond,