

Off the Georgia Coast

By HUGH C. MOORE, Greenkeeper
St. Simon's Island Golf Club, Georgia

MY course is on St. Simon's Island, Georgia. It is very beautiful and in time will be a wonderful course. I think it is the last one that Walter J. Travis laid out, and I must say his last work was his best.

We have some very fine oak trees all along the fairways, and one of the loveliest bridle paths of oaks in the country running down beside the golf course. One nine is cut through woods, and the other is on the water front. There are many water holes.

Greenkeeper Should Help Construct Course

I wish that every greenkeeper could be on the job when the work first starts. I am sure that he could save many dollars for his employer, and a greenkeeper should pick out his own equipment, as a practical man knows which is best.

Controlling Ants and Moles

I have plenty of ants and moles here. I did not think there could be so many. For the ants I am using carbon disulphate, applying with funnels and skewer. I get at the ants early in the morning, before they come out of the holes, as I think that is the best time to kill them. It is a little slow work, but I get good results.

For the moles I am trapping them, also using Mo-lo. Moles are very smart and hard to trap, but I get good results from Mo-lo.

Planting New Course

I am planting Bermuda and Poa Bulbosa on the greens. I keep them well cut and top dressed, also use

plenty of water. On bunkers I am putting in Bermuda stolons. I am also giving them a light top dressing with woods mold, using plenty of water and you can bet they will take hold at once if this method is followed.

A very good way to put in stolons is to use a spade. Take up a spade of soil about one and one half inches deep on a slant, put your stolons in so that the roots are in the middle with the runners extending out from both sides. Keep it in straight rows and very close together, and keep the new planting watered well.

After they get a start, roll them well, and then give them a light top dressing. Then watch them grow. Be sure not to wash them out by watering in one place too long. Water by hand, and keep your sprinkler moving at all times. You can also put in greens the same way. I have one put in now just as I have explained and it is coming beautifully. Do not seed your bunkers and any places that are down hill, as they will all wash to the bottom. That is, as I find it. I believe that the best way to use fertilizer is to put it in your top dressing. I get better results in this way.

Labor and Equipment Problems

Good men are always needed to work on greens and tees. Men that can be trusted. I find that married men are the best. They pay attention to what you are telling them, more so than the single men. Pay them well, then you can expect good service. Keeping equipment in out of bad weather when not in use, all bolts tightened up and all lost bolts replaced means much longer and more

WALTER J. TRAVIS



One of the last pictures ever taken of this "grand old man" of golf course architecture, looking over the lay-out of the St. Simon's Island course, near Brunswick, Georgia



Numbers four and six fairways, along the lake on the St. Simon's Island course



*Number five hole on the new St. Simon's Island course.
This is a one-shotter, 185 yards across the water to the
green shown in the foreground*

satisfactory service. I have seen greenkeepers use wire instead of bolts for quick repair. That's a "down at the heel" farmer's repair job.

Shake Hands with John Morley at Detroit

If any of my brother greenkeepers have any dope on ants and moles I would be glad to hear from them.

I think that our association is a life-saver for the greenkeeper, and I feel that it is doing a world of good.

I know that the money each member is spending for his dues, sick and death benefits, could not be spent for a better cause. I shall always be a member whether I am a greenkeeper or not. Down here in Georgia it is some long trail to Detroit, but I'm going to attend the annual convention where I will have my first opportunity to get acquainted with our members, and I want to shake hands with John Morley. He must be worth knowing.

Houses the Martins Call Home

APARTMENTS de luxe for our little feathered friends, the martins, are a specialty with Fred A. Burkhardt, greenkeeper at Westwood Country Club, Cleveland.

Every winter he builds some of these houses, and he knows how to build the kind of house that the most discriminating martin is proud to call "home."

"One of the most important jobs is spring house cleaning," says Mr. Burkhardt. "You can't keep the sparrows out after the martins migrate south, and a martin will

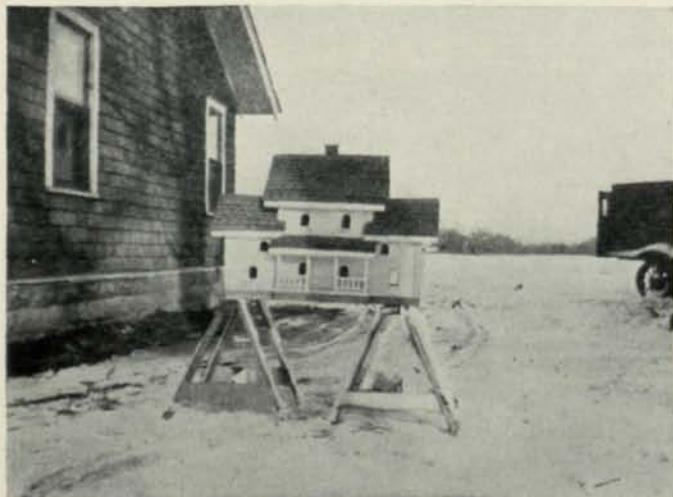
not use a house left just as the sparrows vacated it. I always thoroughly clean and disinfect my martin houses along in February every year, then cover them closely to prevent the sparrows re-entering."

Sparrows will take possession of martin houses earlier than the martins arrive on the scene here in this climate, Mr. Burkhardt explains. By covering the houses tightly with burlap as soon as they are cleaned, the sparrows will be kept out. Then as soon as the first martins appear in the spring is time enough to take the covers off.

Martins seem to know which houses belong to them, and they will fight for possession, while a sparrow takes for granted a "Welcome" sign over every door. Mr. Burkhardt has often remarked that the same families return to his martin houses every spring, and there is an immediate disturbance noted if sparrows have encroached on their domain.

"Martin houses should be divided into rooms six by six or eight inches, and the lower sills of the doors should always be cut one and a half inches above the floor of the room," Mr. Burkhardt advises. "I can't say why this should be so, but I have experimented in many ways with these little birds, and find that they like to jump down into their home, and not walk straight into it."

Three coats of white lead and oil applied to a new bird house will insure its fresh appearance for three seasons.



One of the Burkhardt Martin Houses

Municipal Golf at a Profit

By EDW. M. LAING

Secretary and Superintendent of Parks
Highland Park East Park District, Highland Park, Ill.



Edw. M. Laing

IT is with much misgiving that I am writing this article after having faithfully read the many interesting articles of the experienced greenkeepers and others appearing in your magazine, but I feel that I would be ungrateful should I neglect to voice some recognition of their valuable work and unselfish willingness to impart the results of their experience to their co-workers. It would be hard to single out any one or number of articles appearing in your paper for special comment, for they all have merit.

During the last thirty years I have engaged in various pursuits. None have been more interesting than the care and management of a golf course, and I may say none required as much unceasing care and watchfulness. I can safely say that the varied experiences of that period have proved valuable in my present occupation.

My experience in the management and operation of a golf course began some six years ago. A nine-hole course was built by the Highland Park East Park District at that time. It is located in the Skokie Valley. To the reader who is familiar with the Skokie Valley along the North Shore in Lake County, Illinois, it will not be necessary to state that it would be hard to find a location more suitable for the production of fairway turf.

The Park Commissioners had purchased 120 acres of this land half of which was subject, at that time, to overflow. Therefore nine holes were constructed on the higher ground. To say that the commissioners were severely criticized for this purchase and venture is putting it mildly, but they had the foresight to grasp the future situation, and perhaps the only result of these objections was to make them proceed more slowly with the expenditures.



View looking south across water hazard to Number 3 green at Sunset Park municipal course

Limited fairways were plowed, disced, harrowed, and seeded and simple dome greens were built with no provision for watering them. Well, that doesn't sound much like a golf course. I

may say that the lack of water for the greens had much to do with the writer's present occupation and interest in golf as I was elected a commissioner for the purpose of securing water for the greens, and the next season saw the greens watered to the satisfaction of the patrons of the course.

Draining Overflowed Land

About this time a drainage ditch was projected up the valley through the property providing a means for drainage of the overflow portion and making the construction of nine additional holes possible. Much of the ground occupied by the second nine holes is not more than three and one-half feet above mean water level and before work of construction could be commenced some means of drainage had to be provided. A system of tile drains was laid, the quantity of which was materially restricted by the limited funds available. I might say that this lack of funds was a most important factor in all the development of the course.

The drainage thus constructed at least made it possible to plow and disc and, profiting by the experience of the unpardonable condition of the rough in the first nine holes, the entire area was plowed. Portions of the area plowed were covered with a heavy growth of cat tails. This work was done in the late summer and fall of the year and remained in this condition until the following year when the work was completed. The tile drains, while being a material benefit, were not adequate for the following reasons: first, sufficient depth was impossible for the efficient operation of the drains; second, a large water-shed lay beyond the property causing flooded condition during storm periods.

Water-shed Presented Unusual Problem

To provide for the drainage under these several conditions a system of open ditches has been dug. Where these ditches cross fairways double strength sewer pipe has been laid. The pipes vary from twelve to twenty-four inches in diameter. Where possible the tile drain first laid has been diverted to discharge into these ditches.

(Continued on page 40)

Steam Sterilization of Compost

Report of test conducted by Mr. Everett Jenne, chemist at the plant of the Union Gas and Electric Company, Cincinnati, Ohio, for the benefit of the Makatewah Country Club of Cincinnati.

We are indebted to Mr. James Muir, vice-president of the National Association of Greenkeepers of America, for sending us the interesting report which follows. Also to the courtesy of Mr. C. W. DeForest, chairman of the Green committee of the Makatewah Country Club, and Mr. George Benzie, greenkeeper, for whom the exhaustive test was made.

In the summary of results it is noted that by wetting down compost before subjecting it to heat from the steam coil, it is possible to secure a more rapid and uniform degree of heat throughout the pile. For several years, the soil used in greenhouses has been subjected to heat in this manner, not only in order to kill weed seeds, but to assist in protecting the plants from diseases, the germs and spores of which may be present in the raw compost.

While steam treatment is proved to be a successful method in eradicating the major portion of weed seeds in compost, it must be remembered that many of the weeds infesting golf greens are present because of weed seeds being blown upon the greens from surrounding rough areas, and in some cases from the water supply and from heavy washes due to rains.—Editor.

THIS test of the compost used on the greens of the Makatewah Country Club was made in order to determine whether enough weed seeds were present in the compost to cause serious trouble, and to determine whether it would be practical to kill these weed seeds by heating the compost with a steam coil.

Method of Testing

The 220 lb. sample of compost received was divided into five lots of 44 lbs. each.

Lot I was placed in an 18" x 18" germination box without heating or adding seeds.

Lot II was heated to 160° F., held at this temperature for 20 minutes and placed in an 18" x 18" germination box.

Lot III was mixed with 60.2 grams of red clover seed, 103.6 grams of timothy seed, and 40.6 grams of mixed weed seeds and placed in a germination box without heating.

Lot IV was mixed with the same amounts of seeds as Lot III, heated to 160° F, held for twenty minutes, and placed in a germination box.

Lot V was similar to Lot IV, except that it was heated as hot as possible with the steam coils used.

The timothy and red clover seeds were known to have a high percentage germination. The weed seeds used were screenings from various seeds. Red clover has a hard shelled, oily seed, and timothy has a dry, thin shelled seed. Most seeds fall in one of these two classes, so that a temperature which would kill both clover and timothy seeds would kill nearly all weed seeds.

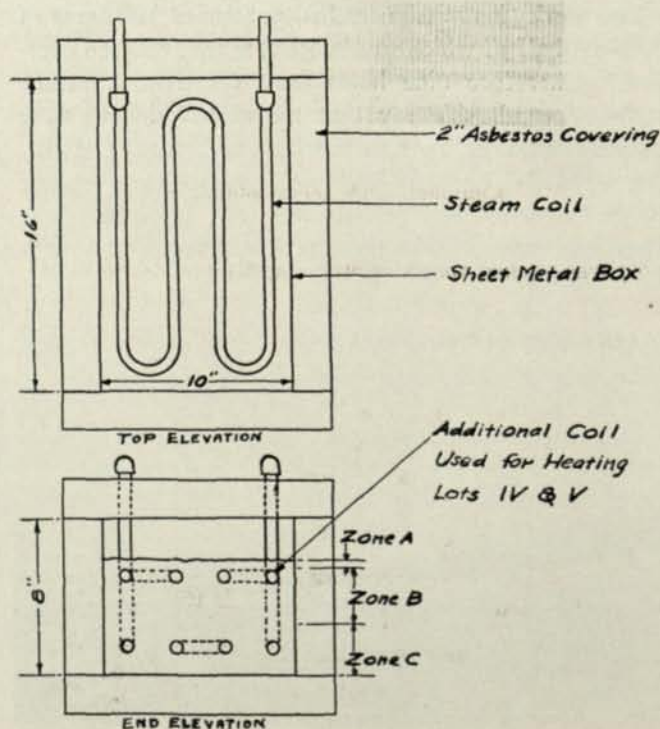
The difficulties met with in heating the compost, the time necessary to heat it, and temperatures actually reached are described under the heading "Method of Heating."

Method of Heating

HEREWITH is shown a sketch of the 8" x 10" x 16" sheet metal box used for heating the compost with a 3/8" pipe coil. Temperatures at the surface were

measured by means of mercury thermometer lying flat along the surface with bulb barely buried. Temperatures at Zones B and C were measured with the thermometer nearly vertical. The asbestos cover was removed only long enough to take a reading.

On the first trial, Lot II was placed in the box dry, and only slightly packed. Steam at atmospheric pressure was turned into the one pipe coil used. The temperature at the surface, initially 70° F, rose very slowly. After two hours this temperature had only reached 108° F, and after 5½ hours it had ceased to rise, the



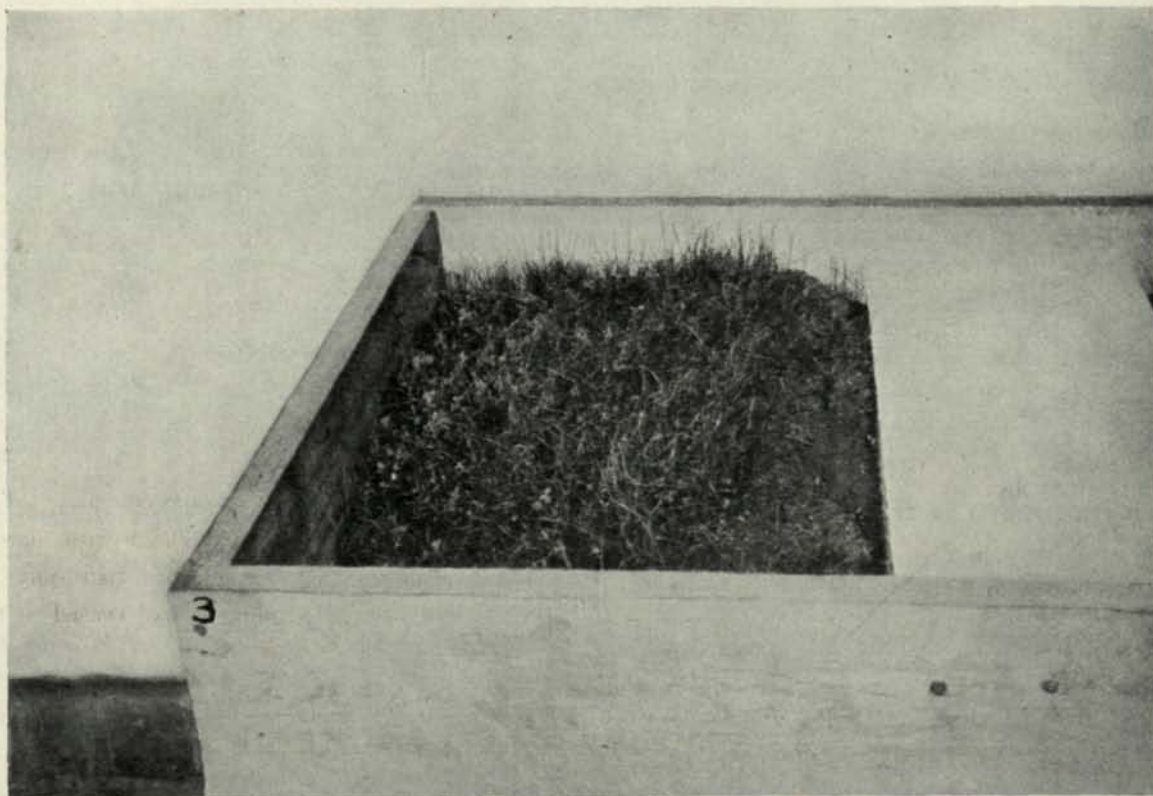
Diagrammatic sketch of steam coil installation

surface temperature then was 120°-130° F and other temperatures are shown in the table.

After cooling overnight the box was emptied to the level of the pipe coil. This remaining compost was then thoroughly wet down but not worked to make a mud, then the remainder of the compost was added dry. In two hours the surface had reached a temperature of 160°-165°F and the remainder 165°-180°F, as shown in the table. After holding for twenty minutes at this temperature the compost was emptied out and found to be uniformly moist but not wet or lumpy.

lighted room, the temperature of which varied from 70° to 80°F, and were then watered daily.

On March 14, three days after the start of the test on Lots I, II, III, and IV there was one blade of grass and one dicotyledenous weed showing in Lot I. No seeds had germinated in Lot II. Lot III showed a thick stand of both grass and clover, but no plants which could be definitely recognized as weeds. Lot IV showed some clover and a few blades of grass. The first plants in Lot V appeared on March 15, but not as many as in Lot IV on the 14th.



LOT III

Compost with seeds added, but not heated, photographed one month after start of test

Two coils were used in heating Lot IV but the compost was packed well and only slightly moistened around the coils. This took longer to heat than Lot II but finally reached about the same temperature. The compost when emptied was dry and friable.

Two coils were also used in heating Lot IV, but the compost was thoroughly wet around each of the coils and packed well in place. This reached 160° in about the same time as Lot II but in an attempt to heat it to 200°F the steam was left on until, after 6 hours, there was no further rise in temperature. When emptied, the compost was dry but slightly lumpy.

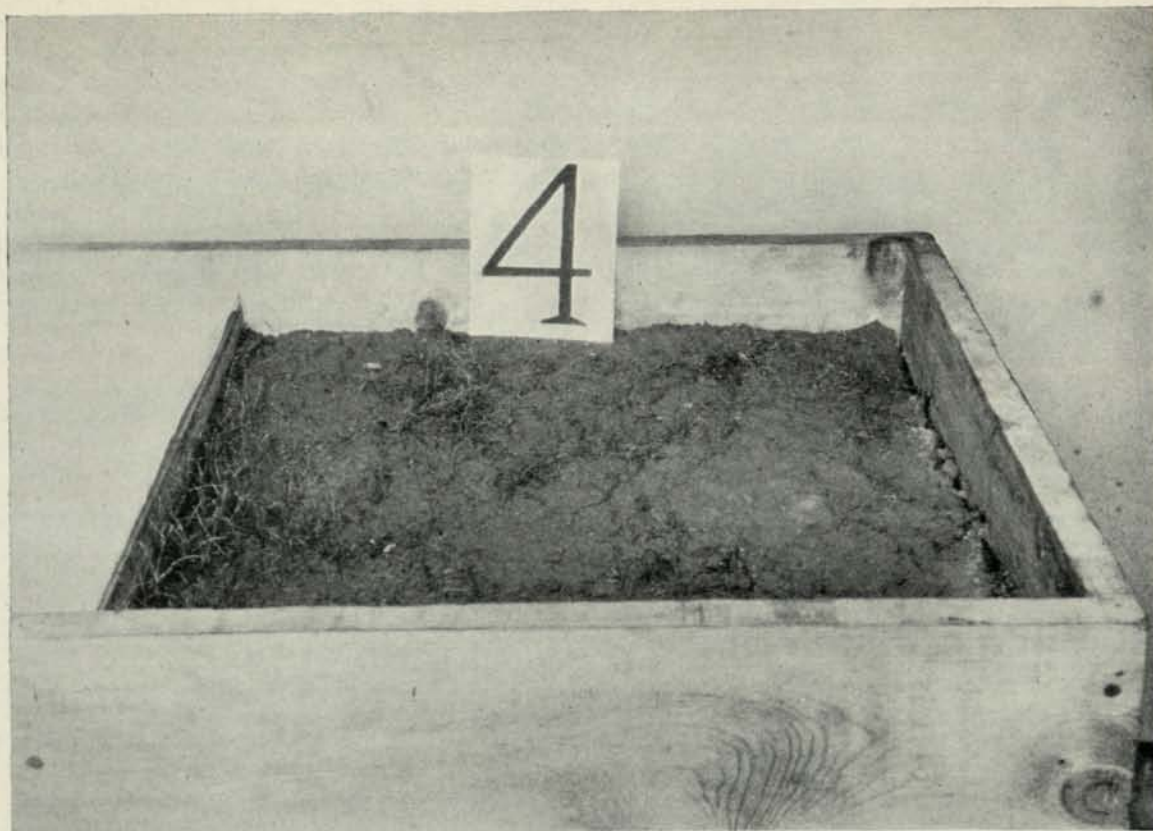
Germination Results

THE germination test of Lots I, II, III and IV was started on March 11, 1927, and that of Lot V was started on March 12. The boxes were placed in a well-

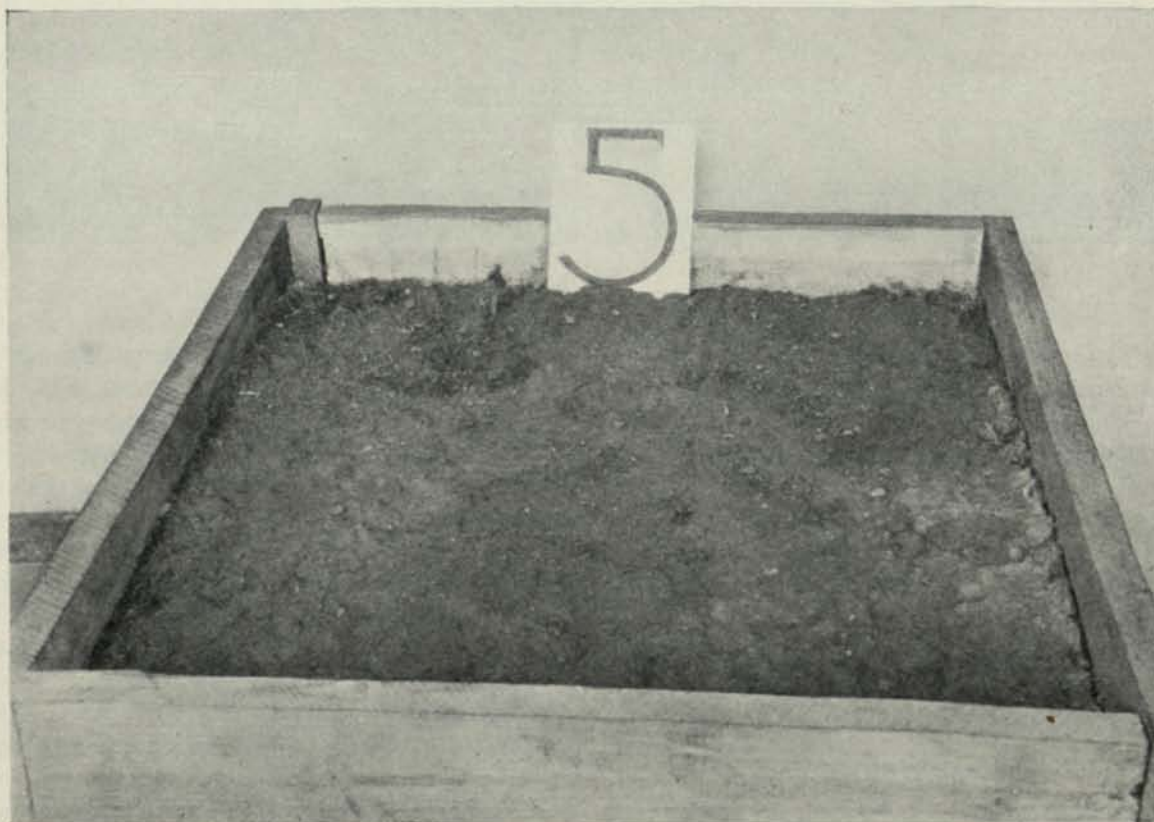
During the following week nothing appeared in Lot II, and only a very few additional plants in Lot I. Much additional grass came up in Lot III and some additional clover. Some additional grass and clover appeared in Lots IV and V but very much less in IV than in III and less in V than in IV.

On March 21 there were in Lot I five blades of grass, five clover plants and seven dicotyledenous plants other than the clover. Nothing had appeared in Lot II. In Lot III, there was a thick start of grass and clover, too many plants to make an estimate of the number. In Lot IV there were about 500 blades of grass, 150 clover plants and a very few plants which could be definitely recognized as weeds. In Lot V there were about 75 blades of grass, 25 clover plants and a very few weeds.

In Lot III the growth of roots was thick enough to keep the soil fairly loose, and plants shaded the soil



LOT IV
Compost with seeds added and heated to 160°, photographed one month after start of test



LOT V
Compost with seeds added and heated to 180-200°, photographed one month after start of test

enough so that it did not dry out very rapidly, but in the other lots the surface had become quite hard due to alternate watering and drying. This poor mechanical condition of the soil was probably the cause of the slow growth of the plants in Lots I, IV and V. Many of these plants finally died, leaving some patches growing fairly well in Lot IV and leaving only a few scattered plants in Lot V. In Lot I only one blade of grass and one dicotyledenous weed were left on April 14, 1927.

On March 22, the only seed which germinated in Lot II appeared.

Lots III, IV and V were photographed on April 12, and Lots I and II on April 14.

The more important data on the treatment and germination of the various lots is tabulated in the accompanying table.

Discussion of Results

MANY weed seeds are extremely slow to germinate, but, unless a very large percentage of the seeds present in Lot I were dormant, this test shows that there were very few live weed seeds in the compost.

Lots II and IV show that heating to 160°-180° killed many of the seeds present.

Lot V shows that most of the seeds were killed by heating to 180°-200°F. Many of those which did germinate were probably on the extreme surface which could not be heated to 180°F.

Summary of Results

SO few weed seeds germinated in the check lot No. I that unless there were a large number of slow-germinating or dormant seeds present, the value of attempting to kill them by heating the compost appears doubtful.

Table Showing Heated Hours and Temperatures Attained

	Heated Hours	Temperature Attained		
		Zone A	Zone B	Zone C
Lot II—1st Trial (Dry).....	5½	120-130°F	130-140°F	145-155°F
Lot II—2nd Trial (Wet).....	2	160-165°F	170-180°F	170-180°F
Lot IV—(Packed).....	3½	160-165°F	165-175°F	165-175°F
Lot V—(Wet and Packed).....	6	170-180°F	180-200°F	180-200°F

The compost is such a poor conductor of heat that it would be a very difficult matter to heat any considerable quantity of it by means of a steam coil in a box or a pile.

Lot II, in which the compost was well wet down around the coil, heated through rapidly and more uniformly than the other lots. This method, i.e., wetting down the compost around a steam coil and then letting the whole pile steam through, might work fairly well on larger quantities.

Heating to 180°-200° would kill most of the weed seeds in the compost and to 160°-180° would kill many of them.

Know Before You Sow

Seed Selection We will select your Seed.

Certification We will certify the Purity and Germination.

Checking We will check your actual deliveries before you sow.

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International Seed Testing Laboratories, Inc.

E. E. Pattison, Director J. M. Stanton, Asst. Director
11 Park Place NEW YORK CITY

Member
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Table Showing Treatment and Germination

	Lot I	Lot II	Lot III	Lot IV	Lot V
Weight of Compost.....	44 lb.	44 lb.	44 lb.	44 lb.	44 lb.
Weight of Seed Mixed with Compost					
Red Clover.....	None	None	60.2 gr.	60.2 gr.	60.2 gr.
Timothy.....	None	None	103.6 gr.	103.6 gr.	103.6 gr.
Mixed Weeds.....	None	None	40.6 gr.	40.6 gr.	40.6 gr.
Heating					
Temp. to which heated.....	Not Heated	160-180°F.	Not Heated	160-175°F.	180-200°F.
Time held at this Temp.....		20 minutes		20 minutes	40 minutes
Time to reach this Temp.....		2 hours		3½ hours	6 hours
No. Heating Coils Used.....		1, 4-turn		2, 4-turn	2, 4-turn
Condition of soil at start of heating....		Wet around coil. Remainder dry.		All dry. Packed well.	Fairly wet around the coils, packed well.
Condition of soil at end of heating.....		Slightly moist, friable.		Dry, friable.	Dry, slightly lumpy.
Germination					
Date Placed in Germination Boxes.....	3-11-27	3-11-27	3-11-27	3-11-27	3-12-27
Dates on which lots were photographed..	4-14-27	4-14-27	4-12-27	4-12-27	4-12-27
Dates when first plants appeared.....	3-13-27	3-22-27	3-13-27	3-13-27	3-14-27
Appx. No. of Seeds which Germinated					
Grass.....	5	0	Many	500	75
Clover.....	5	0	Many	150	25
Weeds.....	7	1	Very Few	Very Few	Very Few

Laying the Greenkeeper Off

By JOHN MACGREGOR, 2nd vice president
National Association of Greenkeepers of America

IF this article brings a note of realization to some golf clubs in the good old U. S. A. it will have accomplished its purpose.

The old adage may very well suit, "Wilful waste makes woeful want."

A great many clubs lay their greenkeepers off in November, and inform them that their services will not be required until spring, going on in the belief that the club is saving money by following this method.

The laying off of a greenkeeper in the fall is one of the reasons why experts are called in to find out what can be done with the course to put it in playable condition. It usually does not require an expert to diagnose the case. Many times the greenkeeper has already told the club officials exactly what the expert did, perhaps in less flowery speech.

Innumerable Winter Duties

During the winter on a course, there is generally more work than one man can attend to. Overhauling machinery, which is no small item; painting benches, tee boxes, flag poles, tee markers, buildings and equipment.

Shrubs, too, demand attention, or they soon become unsightly. Trees can be moved and placed where they will beautify the landscape. Cutting out dead wood, and removing broken branches. Nothing is much more detrimental to trees than broken branches hanging and swaying on other branches, causing wounds that will start decay. Where a branch is torn away from the trunk, decay gets its strongest foothold. Result, the tree doctor has to be called in, and nearly everyone knows that the services of a tree surgeon are not given gratis.

During the winter, there is danger of freeze-outs in depressions on the greens. If a man were on the grounds all winter, he could break the ice over such places, letting the air penetrate and saving the grass, which otherwise would have to be re-turfed at considerable expense.

Then there is the rough. Burning this area over before the grass starts to grow destroys millions of weed seeds.

Fairways should be fertilized before the frost has left the surface. No ruts are then left by machinery, which are difficult to eradicate.

Where Haste Makes Waste

When a greenkeeper has been off the course all winter, he returns in the spring and starts getting his equipment in order, all the time realizing that the course needs his urgent attention. The result is that some "slap-stick" repair work is done, which later in the season necessitates spending many precious hours restoring machinery to some degree of day to day efficiency. Or, if the equipment is sent to a repair shop to be overhauled, nine cases out of ten it is not returned to the club until the grass is so long that it is necessary to rake it after cutting.

I could go on, but I believe these reasons are sufficient to prove why it pays to keep a greenkeeper on the job all the year around.

Think it over, and give it a trial. You will undoubtedly find that paying your greenkeeper his salary through the winter months will result in a far greater money saving than cutting him off the payroll when the first cold winds begin to blow.

Where the Big Tournaments Will be Held

February 27-March 2—Twenty-fourth Annual Spring Tournament, **Pinehurst, N. C.**

March 14-18—Second Annual Florida State Women's Golf Association Championship, **St. Andrews Course, Mt. Plymouth, Fla.**

March 19-23—Belleair Amateur Championship, **Belleair Country Club.**

March 23-24—Florida Open Championship, 36 holes over **Florida C. C.** and 36 holes over **Timuquana C. C., Jacksonville, Fla.**

March 26-30—Men's Championship, **Shore Hills Golf & Country Club, Bermuda.**

March 26-31—Gulf States Championship, **Biloxi G. C., Biloxi, Miss.**

March 29-30—Twenty-sixth Annual North and South Open Championship, **Pinehurst, N. C.**

April 4-7—Florida State Amateur Championship, **Timuquana C. C., Jacksonville, Fla.**

April 6-12—Twenty-eighth Annual North and South Amateur Championship, **Pinehurst, N. C.**

April 16-20—Eighteenth Annual Mid-April Tournament, **Pinehurst, N. C.**

May 7-12—British Open Championship, **Royal St. George's Club, Sandwich, Kent.**

May 14-19—British Ladies' Championship, **Hunstanton.**

May 21-26—British Amateur Championship, **Prestwick, Ayrshire.**

June 11—Qualifying Rounds in National Open Championship, various districts.

June 13-16—Metropolitan Amateur Championship, **Fenimore C. C., White Plains, N. Y.**

June 21-23—National Open Championship, **Olympia Fields C. C., Chicago.**

July 18-20—Metropolitan Open Championship, **Shackamaxon C. C., Westfield, N. J.**

July 31-Aug. 5—Public Links Championship, **Cobbs Creek Course, Philadelphia.**

August 30-31—Walker Cup Matches, **Chicago Golf Club, Wheaton, Ill.**

September 10-15—National Amateur Championship, **Brae Burn C. C., West Newton, Mass.**

September 24-29—Women's National Championship, **Virginia Hot Springs Golf and C. C., Virginia Hot Springs, Va.**

October 5-6—Lesley Cup Matches, **Winged Foot Golf Club, Mamaroneck, N. Y.**

Clean Seeds and Fewer Weeds

By E. E. PATTISON, Director

International Seed Testing Laboratories, No. 11 Park Place, New York City
Formerly Seed Analyst U. S. Department of Agriculture, Washington, D. C.

Editor's Note:

Considering the original cost of grass seed, the expense involved in seeding a golf course, and the possibility of infesting turf with obnoxious weeds, quality in seed sown is of tremendous importance. Mrs. Pattison is one of the outstanding authorities on seed analysis in the United States.

AGROSTIS of all the genera in the grass family is the most important to the person interested in golf. Much has been written regarding this interesting genus, both in America and Europe in order to clear away the uncertainties that exist.

The most helpful and enlightening work has been done by three scientists of the U. S. Department of Agriculture, Prof. A. S. Hitchcock, Systematic Agrostologist, the late Dr. C. V. Piper, Agrostologist in charge of Forage Crop Investigations, and Prof. F. H. Hillman, Associate Botanist, Seed Laboratory. It is to Prof. Hillman that we owe our present knowledge of the seed characteristics.

Of all the species of Agrostis, Redtop is the most valuable agriculturally. It is known botanically as *Agrostis alba*, and its other common name is Herd's grass. Besides its use as a turf grass it is widely used as a meadowgrass, but it will be discussed here only in its relationship to turf. Redtop is a perennial and is a much larger plant than any in the bent group which will be discussed later. It is not indigenous to North America but was introduced from Europe. It thrives best on acid soil. The principal seed producing area is Southern Illinois. Two hundred cars, or 6,000,000 pounds of seed is considered a normal crop. Wholesale prices during the last ten years have ranged from 10 cents to 35 cents per pound for re-cleaned seed.

Virgin is the name given to the rough seed. This seed after reconditioning is marketed as Fancy Redtop, which means re-cleaned seed minus its outer glume; unhulled Redtop, the seed with the outer glume adhering, and chaff Redtop, which is practically free of any seed.

There is no call for unhulled and chaff from Golf Clubs. These by-products are often used as fillers in the cheap lawngrass mixtures.

Identification of Redtop Plants

The standard commercial grade of Fancy Redtop seed tests 90 per cent pure and 90 per cent germination, but, higher testing qualities are generally demanded by those wanting the best turf results. The highest grade now

offered tests 98 per cent pure. But technical purity isn't the only thing that should be considered. It is better to have 96 per cent with practically no weed seed content than to have 98 per cent with 1 per cent weeds. Seed containing 1 per cent weeds may mean sowing 50,000 weed seeds with every pound of seed.

The plant at maturity is from one to four feet tall, with rootstocks, flat blades and an erect often reddish panicle from four to eight inches long with verticillate lower branches. As previously stated, it is a much coarser plant than any of the Bents. It is better suited to fairways than to greens.

Seeding Mixtures

When the seeding of greens with pure Bent is too expensive for a club, economy can be practised by seeding two pounds of Redtop seed and three pounds of Bent per thousand square feet. Any mixture containing a

larger amount of Redtop will not give a satisfactory putting surface because of too many Redtop plants. Redtop when used for fairways is usually mixed with Kentucky Bluegrass and Red Fescue. The late Dr. Piper advocated a mixture of four pounds Kentucky Bluegrass and one pound of re-cleaned Redtop, using 150 pounds of seed per acre. Very excellent results have been obtained in the Metropolitan section by using the following formula:

40% Kentucky Bluegrass	(24 lbs. 85%)
25% Fancy Redtop	(95%)
20% Red Fescue	(95%)
15% South German	
Mixed Bent	(90%)

The best seeding time in northern states is between August 15th and September 15th. The amount of seed used is 150 pounds to the acre.

Time will not be taken here to discuss seedbed preparation and sowing. These will be discussed in the final chapters after we have finished with all the groups.

There was a time not so long ago when unhulled Redtop was generally sold for Rhode Island Bent, and this practice could not be stopped until Professor Hillman made it possible to identify the seeds of the various genera. Too much credit cannot be given Professor Hillman for this valuable and useful contribution.

Even though the seed characteristics are well known it takes the most skillful of analysts to make perfect determination. A great deal of harm is yet being done by improperly trained analysts who are attempting analy-



AGROSTIS ALBA (Redtop)

Drawing made by and published through the courtesy of Professor F. H. Hillman, Associate Botanist U. S. Department of Agriculture

sis of Bent and Bent mixtures. Present space does not permit a recital of golf tragedies that are the result of these faulty analyses. In our chapter on Bent, a few cases will be given.

For the benefit of those who wish to study the seed characteristics we are giving them.

Description of Redtop Seed

The seed of *Agrostis alba* (Redtop) is larger than the seed of any of the Bents. The lemma is yellowish, thick and glazed. The prickles near the apex are not more than one-quarter the distance from the apex. The apex is pointed, the base hairs long and fairly spreading, the palea is broad and two-veined. The adherent type of palea is generally wrinkled. The palea tip is not rounded. The prevailing condition of the palea tip is truncate or broadly notched. The hilum is usually long, slender and dark, linear, not wedge-shaped and elevated. While the seeds of Redtop are sometimes awned, the awn is very rarely below the middle and very rarely long or twisted.

Weed Seeds Commonly Found in Redtop

Achillea millefolium
Potentilla monspeliensis
Cerastium vulgatum
Plantago rugelii
Juncus tenuis
Anthemis cotula
Rudbeckia hirta
Panicum lanuginosum
Eleocharis obtusa
Silene antirrhina
Rumex acetosella
Chrysanthemum leucanthemum
Panicularia nervata
Agrostis elliottiana
Scripus sp.
Plantago major
 Yarrow
 Cinquefoil
 Mouse-ear chickweed
 Blackseeded plantain
 Slender rush
 Mayweed
 Browneyed Susan
 Hairy panicum
 Blunt spike rush
 Sleepy catchfly
 Sorrel
 Oxeye daisy
 Nerved manna grass
 Plantain

The presence of certain of the above weeds in a sample of *Agrostis* indicates American Redtop.

The next article will be devoted to *Agrostis Vulgaris*—Rhode Island Bent.

GREENKEEPER'S ALMANAC

MARCH

By JOHN MACGREGOR
 Chicago Golf Club

THERE may be some painting to be done yet, tee boxes, benches, buildings.

* * *

It is not wise to do much tree pruning now, as the sap has started to flow on some trees, but dead wood can still be cleaned out.

* * *

Burn the rough, and kill innumerable weed seeds, and make the rough a pleasure to cut. It is hard to cut dead grass, and you will find the grass has a healthy hue after burning.

* * *

If fertilizing is to be done, do it before the frost leaves the surface, as this eliminates unsightly ruts caused by machinery and the early rains will carry the fertilizer to the roots.

* * *

See that the compost is in shape for the first top-dressing. In some states top-dressing and watering never ceases.

* * *

You will have bought your new equipment at the Golf Show, so that you will be "rarin'" to go at the first sign of spring.

* * *

If the regular greens are kept open all winter, be careful to keep players off the greens for a week or more until the frost is out, as much damage can be done at this time.



"FRIEND" GOLF SPRAYERS

Are made large, medium and small, 5 to 30 gal. per minute capacity. One or two golf guns as shown in the picture. Double compartment tanks. High pressure Motor Pumps. Highly developed. True Friends. Ask for catalog.

One of the smaller "Friend" golf sprayers at work. The same machine sprays shade trees, too.

See it at the Show

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