

Questions and Answers

All questions sent to the Green Committee will be answered as promptly as possible in a letter to the writer. The more interesting of these questions, with concise answers, will appear in this column each month. If your experience leads you to disagree with any answer given in this column, it is your privilege and duty to write to the Green Committee. *Please bear in mind that the recommendations given apply specifically to the locality designated at the end of the question.*

1. **Sheep's fescue being sold as European red fescue.**—What is your opinion of the following statement received from the * * * Seed Company? "In regard to your inquiry for European red fescue we would state that there is no European red fescue grown. Our personal investigation has shown that some concerns in Holland are selling a certain type of sheep's fescue as European red fescue. We are sending you a sample and quotation on this seed, but we will sell it for what it is, sheep's fescue."—(Illinois.)

There is plenty of red fescue in numerous varieties in Europe. Before the war the seed was gathered and could be obtained. Whether the European red fescue seed on the market now is true red fescue or sheep's fescue we are unwilling to say, as thus far we have been unable to find any absolutely dependable character by which to distinguish the sheep's fescue seed from red fescue seed. The actual identity of the seed, therefore, we would be unable to state until we had grown plants.

2. **Order of preference of different manures in compost.**—Would you be kind enough to tell me the best manure to use for compost? Is sheep manure really good, or can I procure better than it?—(New Jersey.)

All manures are good, but we would list them in about this order of preference: cow, horse, sheep. Chicken manure is also excellent, but it needs to be very thoroughly mixed in the compost.

3. **Timothy as a grass for tees.**—We will have to seed new tees this spring. Our native grasses are Rhode Island bent and timothy. Would you advise the use of this mixture on our tees?—(Massachusetts.)

We have some doubts about the advisability of using timothy on your tees, and would advise you to use redtop.

4. **Pine sawdust as soil admixture; layering putting-greens; preventing adobe soil from baking.**—Will you please inform me if it is possible to use pine sawdust as a lower layer in the making of a green? We are confronted with adobe soil at our * * * course, which packs very hard, and we are endeavoring to find some sort of a remedy that will create a cushion to furnish ventilation to the grass roots.—(California.)

We think you would find results very unsatisfactory by putting in a layer of pine sawdust, or, indeed, of any other material. Generally speaking, the layer type of green has not been found satisfactory. What you need to do is to mix enough sand and humus in your adobe soil until the mixture is practically the same as a garden loam. Offhand we would say that you could use for the top eight to twelve inches of soil, about four inches of sand and a liberal amount of humus material. A good deal of pine sawdust can be used as part of the humus material, but this would really be much better if it were first composted with soil or manure for six months or a year. A small amount of pine sawdust can be mixed with the soil and have some advantage, but if an excessive amount

is used some difficulty may be experienced from injury to the grass on account of the resin which the pine sawdust contains. We do not think you will ever get your green in a satisfactory condition until you get top soil of a satisfactory type.

5. **Seeding northern putting-greens and fairways located on sandy soil; economy in using redtop in mixture with bent.**—Our club is located within five miles of the shores of Lake Huron, where the soil is sandy in spots and in some places has a heavy yellow clay. Could you outline to the writer what seeds would be best for the greens in this section, as well as for the fairways?—(Michigan.)

Red fescue is usually the best grass on soils distinctly sandy in texture. If, however, in your putting-greens you change the character of the soil so that it makes a good loam, the bents have a little superiority over the fescue. On your fairways you have two choices, either straight red fescue or else bent, either Rhode Island bent or German bent, which is admirably adapted to sandy soils in your latitude. To reduce the cost of seeding we would suggest, in case you use the bents, that you seed the fairways to a mixture consisting of 4 pounds of redtop to 1 pound of bent. The redtop is very satisfactory, but is comparatively short-lived, and in the course of about three years your fairways will be straight bent, which will gradually replace the redtop. By using redtop in the original seeding you will save considerable in your seed bill.

6. **The use of muck and lake-bottom soil; composting it with stable manure; redtop, fescues, and bents for northern putting-greens; rate of seeding redtop.**—In constructing 9 of our putting-greens last spring we used a top-soil which we mixed up as follows: 70 per cent muck, 20 per cent black dirt or clay loam, and 10 per cent sharp sand. We did not incorporate any fertilizer, but in the fall applied 150 pounds of hydrated lime with a top-dressing of muck, clay loam, and sand in about the same proportions as used in constructing the greens. In May we sowed 50 per cent redtop and 50 per cent Chewings fescue, 125 pounds to the green, averaging in size 80 by 80 feet. Owing to a very hard summer for want of rain and the great and continued heat, we could do nothing to bring forward what seed germinated. We covered the greens with hay to protect them, but all to no purpose; and not until after the fall seeding did we get any growth; and still the lack of rain was a great handicap. We saw no signs of the fescue coming up except for a few blades here and there; but the redtop was excellent and formed a dense growth, but later, toward the end of November, turned yellow and thinned out and generally looked sickly. We accordingly decided to experiment with the use of acid phosphate, nitrate of soda, and muriate of potash, on patches of about two yards square on different parts of the green, with different compositions of the above fertilizers, and found a very great change by using the three in equal proportions, the grass on the treated plots becoming of good color and healthy. What I desire is to get a condition of soil which will not bind and will allow a ball being pitched right up to the hole and staying "put" without the necessity of having the green, as heretofore, in a sodden condition. I would also like to know what grasses will thrive on a soil such as we have here. We also have available for use about 1,500 loads of the top surface of the bottom of one of our lakes.—(Minnesota.)

The chief difficulty in using muck is the inert condition of the material. Muck is liberally supplied with plant food, but the food is locked up or unavailable for plant use. Plants will thrive in it only after it has decayed. This decay is effected by the introduction of microscopic life, which is best accomplished by the application of stable manure. If you had used several loads of stable manure in preparing this mixture we believe you would have had much better results. As regards commercial fertilizers to be used on the greens you have constructed, we would invite your attention to the article on this subject in the October, 1921.

BULLETIN. Ammonium sulfate is to be preferred to sodium nitrate in that the former discourages the growth of clovers and certain weeds while, at the same time, encouraging the development of the bent and fescues. We would also advise you to compost your muck and clay loam with stable manure, and the more stable manure you put in the compost pile, the better. After the mixture becomes thoroughly pulverized through composting we would then advise your using it as a top-dressing. In the meantime the use of commercial fertilizers will keep the grass growing until the plant food in the soil is liberated.

In regard to seeding putting-greens, we consider that you used too much redtop for best results. We recommend as a maximum rate 5 pounds to 1,000 square feet. If the fescue you used had been of reasonably good germination it would have been better not to have used any redtop at all. Redtop makes a very vigorous growth at the start and gives the appearance of being a very fine putting-green grass, but it afterwards becomes coarse and the turf open and poor. We believe, however, that the bents will give you a much better turf than the fescues.

In regard to the top-surface soil you have taken from the bottom of one of your lakes, we would strongly advise you to compost this with stable manure before using.

7. Red fescue vs. bluegrass for tees.—Bluegrass is natural to our soil and climate. Would it be better to reseed our tees with bluegrass or with red fescue, which some authorities think offers a better turf for the purpose and stands up well under hard usage?—(Indiana.)

If the turf of your tees is very poor we think you will find resodding preferable to reseeding. If, however, you must reseed the tees, we would suggest that you use redtop and bluegrass, especially since bluegrass naturally forms your turf.

8. Average purity and germination of Kentucky bluegrass seed.—What information can you offer as to the average purity and germination of bluegrass seed?—(Indiana.)

Lots of Kentucky bluegrass seed purchased by one user during the past ten years have shown an average purity of 77 per cent and an average germination of 63 per cent.

9. Specifications for ammonium sulfate and bichloride of mercury in soliciting quotations.—In making inquiry for prices on ammonium sulfate and bichloride of mercury should any specification be made as to grade, percentage of strength, or other details?—(Indiana.)

These are both standardized products and no specifications need be made in connection with purchasing other than to request pure stocks.

10. Commercial humus as a top-dressing.—Is commercial "humus" or good muck a desirable substance to use as a top-dressing?—(Pennsylvania.)

Yes, if it does not cost more than one-fourth the price of good barnyard manure. Even when muck or peat deposits occur on a golf course, it is best to use it as an element in compost heaps rather than raw.

11. Ice remaining on turf; winter-killing of turf.—On a couple of our putting-greens we find the water and snow rest and form into a heavy layer of ice which remains on parts of the greens until the sun melts it. This is due to bad drainage system. As it would be unwise now to remove the sod, I write to ask if you could let me know if there is any solution or preparation we could put over the ice when formed on the green. Are we right in assuming that when

the sun penetrates the ice and melts it, and the standing water freezes over again, and the process thus continued for any length of time, it is bad for putting-green turf?—(New Jersey.)

Three years ago putting-greens and fairways around Washington were covered for two months with a sheet of ice, but no harm whatever resulted to the grass. Even in New England, where similar conditions occur, there never seems to be any winter-killing of the grass unless the turf is water-logged; that is, the killing occurs in low places where water stands or in areas below snow banks where the soil is kept continually soggy. In other words, as far as our information now goes, winter-killing is always associated with water-logging of the soil. The practical significance of this is that you need not worry about your putting-greens if they are ordinarily well drained, but if the drainage is such as to keep the soil water-logged you may anticipate killing. We have tried a good many times to emphasize the point that probably 70 or 80 per cent of all turf troubles are associated with insufficient drainage, which is admitted to be the case with your greens. As regards getting rid of the ice itself, this could probably be accomplished by covering the surface with well-rotted barnyard manure, or even with straw or leaf-mold, as all of these have a pronounced tendency to melt ice. The whole matter is one of great interest, and we trust you can observe conditions carefully during the winter and in the spring advise us as to what actually happened.

12. **Ridding sand greens of weeds.**—We desire to kill all the vegetation within a space of about 12 feet around our sand greens. Salt or creosote have been suggested to us for this purpose. Is there anything better?—(New Mexico.)

Where oiled sand greens are used, as described on page 109 of *THE BULLETIN* for 1921, there is no difficulty in regard to weeds. If sand greens without oil are used, salt is the cheapest thing to keep out weeds.

13. **Comparative values of creeping bent seed containing different proportions of redtop.**—I am sending you samples of creeping bent seed, one which we can purchase at \$1.35 per pound and the other for \$1.15 per pound. Will you please tell me which would be the best purchase?—(New York.)

The seed at \$1.35 per pound contains little redtop and the seed at \$1.15 per pound contains considerable redtop. Under putting-green conditions the redtop will disappear in a year or two, being replaced by the bent. Redtop is not objectionable on putting-greens when sown in mixtures with bent, in view of the fact that it will soon disappear and in its young stages it makes a fair putting surface. We regard the sample at \$1.15 per pound the best purchase for use in seeding a putting-green.

14. **Bermuda greens vs. bent greens for southern Virginia; rate of seeding Bermuda grass.**—We are troubled with crab-grass on our putting-greens during July and August. At Norfolk, where they have Bermuda, they are not troubled with crab. I have, therefore, decided, after my experience with Bermuda grass in the South, to change our greens from bent to Bermuda grass.—(Virginia.)

We are not at all convinced that you are wise in changing from bent grass to Bermuda. You are not far from the northern limit of the growth of Bermuda grass, as indeed you are somewhere near the southern limit

of the bent grasses. Would it not be wiser for you to start in with a single Bermuda green and compare it with your bent greens before you decide on the general change from bent to Bermuda? The maximum amount of Bermuda grass seed you should apply for putting-green purposes is 5 pounds per 1,000 square feet. Bermuda seeds are very small, one pound containing about two million seeds, so that at the rate of 5 pounds per 1,000 square feet you would be putting on 10,000 seeds per square foot. You can really get along easily with half this amount provided the seed is of good quality. The seed should be sown in a thoroughly well-prepared and fairly firm seed bed about corn-planting time, not before, as Bermuda seed will not germinate except in warm, moist soil.

15. Spring seeding and fertilizing of northern fairways; bluegrass; red-top; barnyard manure; bone-meal; fish-scrap.—I would like to know how much grass seed you would sow per acre on fairways, also fertilizer. Would you advise mixing fertilizer with soil or just throwing it broadcast on fairways?—(New Jersey.)

We would recommend that you seed your fairways with a mixture of bluegrass and redbud in the proportion of four pounds of bluegrass to one pound of redbud. On well-prepared soil 150 pounds per acre is heavy seeding; even half of this amount will give a good stand with fall seeding. Fall seeding is much to be preferred. If you must resort to spring seeding, be sure to get your seed in as early as possible; any time when the soil conditions are favorable will be all right in your locality. The question of fertilizers depends, of course, on the richness or poorness of your soil. You gave us no information on this point. The best fertilizer for you to use, in case you can get it, is well-rotted barnyard manure, which should be harrowed into the top few inches of the soil. The next choice to barnyard manure would be an organic fertilizer, such as bone-meal or fish-scrap, depending on which is cheapest. In using the bone-meal or fish-scrap, the amount will depend upon the character of your soil. After harrowing in your fertilizer, scatter the seed broadcast, and then roll the fairways lightly. The grass seedlings do better in a somewhat firm seed bed.

16. Cutting newly sown greens.—How soon after seeding should we start to cut the grass and how often should it be cut?—(Connecticut.)

We would suggest that young grass be mowed as soon as it reaches the height of two or three inches.

17. The use of liquid manure.—We have procured a large iron tank 5 feet in diameter by 4 feet deep, into which we have fitted a screen to hold the manure for tankage, from which we intend to transfer the liquid to three or four barrels, and from those with a hose put the liquid on the green by syphoning same. Have you any recommendations to make with regard to this procedure?—(Minnesota.)

We think your plan of using liquid manure on the green is excellent. We would give one caution—do not apply this liquid in too concentrated a form. It is likely to burn grass, especially the fine turf grasses on putting-greens, by applying too strong a solution of manure, just the same as with

too heavy an application of nitrate of soda or ammonium sulfate. It will be all right for you to apply this liquid and then water the green immediately afterwards.

18. **Invasion of clovers encouraged by an excess of potash.**—I notice on page 203 of the 1921 BULLETIN, as well as in other places throughout the 1921 volume, the statement that an excess of potash encourages the growth of clovers. Is this conclusion derived from general observation or from actual experiments?—(Michigan.)

The conclusion is based on a large number of actual experiments as well as on the general experience of farmers.

19. **Value of sheep manure.**—Where well-rotted manure is not available, will sterilized sheep manure be satisfactory? The advertisers claim an excellent percentage of humus, as well as of potash, phosphoric acid, and nitrogen. We had planned to apply sheep manure with equal parts of black loam.—(Illinois.)

In our experiments we have not found sheep manure nearly as satisfactory as well-rotted barnyard manure. We should say the answer to your question would be that of costs. At equal prices we should prefer the barnyard manure. If the sheep manure costs no more than the barnyard manure it might be well to buy it, as the convenience of its application about makes up for its lower fertilizing value.

20. **Improving drainage in putting-greens.**—Where greens have been built without drainage except natural drainage, what system should be followed for drainage? We have thought of using tile, and in that way it would not be necessary to tear up the whole green but only lines on which tile would run.—(Illinois.)

If a green has poor drainage, probably the best plan of all is to remove the turf, reconstruct the green so as to have ample drainage as well as desirable architecture, and then relay the turf. Tile drainage is the most satisfactory kind of artificial drainage, but if you can so construct your green as not to require any artificial drainage it is that much better.

21. ***Poa annua* in putting-greens.**—For the last three or four years we have been greatly troubled with *Poa annua* in our putting-greens. We have repeatedly raked the greens up and sown with New Zealand fescue and a little creeping bent when we could get it, top-dressed them with sand and loam, fertilized with sulfate of ammonia through the season, and fairly heavily with bone-meal in the fall, but the *Poa annua* seems to be getting worse, crowding out the other fine grasses in the green. Of course, it does not make bad putting up to the end of July, but then it dies off and the greens are pretty bad for about two months until it grows again. Could you suggest anything more that we could do? We certainly do not want to take the greens up completely and reseed them if there is any other way of fixing them.—(New York.)

The trouble you speak of is a general one on northern golf courses. In the latitude of Washington, however, we regard *Poa annua* as rather a desirable feature of putting-greens; it begins to grow late in the fall, and during spring and early summer makes exquisite putting-greens, disappearing entirely about midsummer but so gradually that the bents take its place and unless one watches carefully the transition will occur without your noticing it. Farther northward, as we have learned from several green-keepers, there is a break between the time when the *Poa annua* disappears and the other grasses take its place, which according to your

letter is your experience. We are at a complete loss to make any suggestions as how the difficulty can be overcome. *Poa annua* will reseed itself no matter how closely it is kept clipped, and it is likely to increase year after year under putting-green conditions. It is possible that some chemical may be discovered which will kill the *Poa annua* without any injury to the other grasses; but we fear the chances are exceedingly slight.

22. Fertilization of putting-greens; nitrate of soda and ammonium sulfate.—We notice in a report from the Rhode Island Experiment Station that by the use of ammonium sulfate as a fertilizer the inroads of weeds can be prevented. Would you advise our using this as a fertilizer on our putting-greens? and if so, in what proportions?—(Ohio.)

A good compost dressing such as is described in THE BULLETIN in various articles on compost is as a rule all the fertilizer that is needed for the greens. However, sulfate of ammonia or nitrate of soda may be added, especially in the spring and fall, with good results. Sulfate of ammonia has a tendency to produce an acid reaction in the soil, while nitrate of soda is inclined to produce a neutral or alkaline reaction. We have had reports of those who have used sulfate of ammonia liberally and for a certain length of time to the effect that it should be followed by liberal dressings of compost. Judging from our experiences, you are safe in using sulfate of ammonia at the rate of not to exceed 5 pounds to 1,000 square feet twice a year. The best way to apply it is to mix it with sand or compost and apply dry. There are little definite data on the subject, but it is thought that when applied in this way it may be used for an indefinite number of years without causing any deleterious reactions on the soil. In general we would say you would be justified in anticipating results similar to those obtained by the Rhode Island Experiment Station by following the course that they follow.

23. Soft water vs. hard water for sprinkling turf.—Please give me information regarding the difference in the effect on turf from the use of hard water and of soft water.—(Ohio.)

We really have no definite, clear-cut information in regard to the relative values of soft water and hard water when used on grass turf. The opinion widely prevails that soft waters are preferable for irrigating turf and in cultivating plants. We are unable to find that any accurate experiments have ever been conducted on the subject. Of course, where hard water contains lime, sulfur, magnesia, or other mineral salts in rather large quantities, some difference might be expected. Generally speaking, however, we doubt very much if any difference could be detected between two greens, one watered with stream or pond water and the other with ordinary well water, even after years of use.

24. Compost from oak leaves; tannic acid.—Around our golf course we have the green oak trees. I have made pits and put the oak leaves in them with half soil and some gypsum on the leaves. It has been said there will be too much tannic acid when this is completely rotted. What are your views with reference to this matter? I also made a compost heap of sod, manure, peat, and soil. I understand this should be turned once each month and at the end of a year it

should be ready for use. Your advice on this matter will be appreciated.—(California.)

We have not had a great deal of experience with the making of compost from oak leaves, but from the experience of others we learn that there is relatively little if any tannic acid left when the leaves decompose, as they should for the making of good compost. It is usually well, however, in making compost from oak leaves, or in fact from leaves of any kind, to add some lime and also some stable manure, since these aid in the decomposition of the leaves. Recent experiments conducted by the Rothamsted Experiment Station, England, indicate that nitrate of soda added to the compost piles in which are large proportions of straw, leaves or poorly decomposed vegetable matter, aids in decomposition. We note you are interested in having this information in connection with your golf course, and would call your attention to the article on "Humus-Producing Materials and the Making and Use of Compost" in the April, 1921, number of THE BULLETIN. There is also an item on the subject on page 20 of the January, 1922, BULLETIN.

25. Sheep's fescue for quick growth on poor soil.—We have a piece of ground from which the sod was taken for patching. The soil is very poor, and as the piece is entirely off the course it hardly seems worth while to put on additional top soil. However, it can be seen distinctly from one green and in its present condition is quite unsightly. What seed would you advise planting that would grow quickly, giving a green appearance and tending to control the weeds? —(Pennsylvania.)

In regard to the piece of ground from which the sod was taken for patching, we would suggest that you seed it to sheep's fescue, which will grow on very poor land and which is a desirable grass for the rough.

What and Where is the Longest Golf Hole?

This question has been put up to us by a correspondent. Please send to the Green Committee of the U. S. Golf Association such data as you have in regard to the length and location of the longest hole in the United States, in Canada, and elsewhere in the world. The information will be highly interesting.

