

**GREENKEEPERS' REGISTER**

The editors of *The Bulletin* will be glad to receive letters from greenkeepers seeking employment and place such men in touch with golf clubs needing services of greenkeepers.

**QUESTIONS AND ANSWERS**

All questions sent to the Green Committee will be answered in a letter to the writer as promptly as possible. 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.

While most of the answers are of general application, please bear in mind that each recommendation is intended specifically for the locality designated at the end of the question.

**1. Spring versus fall vegetative planting of greens; creeping bent as a grass for tees.**—We have a nursery of creeping bent of over an acre in area, and also have five large tees planted to creeping bent. We are now ready to plant some of our greens to creeping bent runners taken from our nursery, and would like to know at what season of the year it is recommended that this be done so that the greens may be used for play in the minimum length of time after the planting. Our experience has been that greens thus planted about the middle of August are ready for play the first of November, but we have had no experience with early spring planting. We might add that we find creeping bent is the logical grass for tees, from the standpoint of economy in planting, economy in care after planted, and high character of the turf for teeing purposes. (Missouri.)

We have made plantings of creeping bent by the vegetative method in every month of the growing season, and we prefer August and September for doing the work, for the reason that in the late summer and fall the plantings suffer vastly less from weeds than they do in the spring. This is of particular importance where crab grass becomes a serious pest. Crab grass is especially hard on plantings made in the spring, and at that season will greatly impede the spread of the creeping bent. We thoroughly agree with you in your opinion of the great satisfaction to be derived from creeping bent tees; we do not know of any other grass that is more satisfactory for that purpose.

**2. Grasses for northern putting greens, tees, fairways, and rough.**—Our architect has specified for our greens a mixture of 80 per cent fescue and 20 per cent bent; for our fairways, a mixture of fescue and bluegrass; for our rough, a mixture of Pacey's short-seeded rye-grass and meadow fescue. Would you advise us to accept his specifications? (New Jersey.)

We would caution you against the use of fescue for putting greens. We have visited a great many golf courses and do not know of a single putting green that is more than two years old that is pure fescue, and we know of very few that have an appreciable amount of this grass in them, though hundreds have been seeded to fescue in the past. This is a much over-rated putting green grass in this country. We would advise you to seed your greens to bent at a rate of not to exceed 5 pounds per 1,000 square feet, using German mixed bent, Colonial bent, or Rhode Island

bent. For your fairways we would recommend a mixture of 4 parts Kentucky bluegrass and 1 part redtop, seeding at a rate of not to exceed 150 pounds per acre. This same mixture can be used also on the tees, though it would be better to seed a little bent along with the bluegrass and redtop. For the rough there is nothing better than sheep's fescue or red fescue. Both of these grow in tufts and require little attention. While red fescue does not survive when cut to putting green length, it lasts indefinitely on bunkers and rough when allowed to grow to its natural height. Rye-grass and meadow fescue are good hay grasses, but are not as good as sheep's fescue and red fescue for the rough.

**3. Mowrah meal; its fertilizing value and rate of application used as an earthworm eradicator.**—Mowrah meal for worming greens is now quoted as low as \$50 per ton. If an average of 150 pounds of this material used as a single application on one green would produce satisfactory results, the cost will be about the same as the corrosive sublimate. Some fertilizing value is claimed for this material, the analysis given being as follows: Ammonia, 4 per cent; phosphoric acid, 1 per cent; potash, 3 per cent. We have been carrying out a program, as to fertilizing, of using practically nothing but sulfate of ammonia, with the idea of producing the acid condition of the soil which it is claimed fosters the fine grasses and retards the growth of clover and most weeds. The only exception to the above program is that we apply 1 pound of acid phosphate to 1,000 square feet twice a year, in early spring and again about midsummer. Can you advise us as to whether the above is a true analysis of the material and as to what reaction it would have to the soil—that is, acid or alkaline—in connection with the result we are trying to get? Can you tell us what quantity of this material is required to produce good results? (Indiana.)

We do not know what a fertilizer analysis of pure mowrah meal would show, but the analysis you mention is about the same as one reported to us from other sources, and we are inclined to assume that both represent good grades of mowrah meal. Mowrah meal naturally possesses some fertilizing value because of its available nitrogen, phosphoric acid, and potash content, but we would not advise a club to purchase mowrah meal because of this. It is an excellent worm eradicator if not badly adulterated, and can be used with safety. The fertilizing value of mowrah meal is in our opinion incidental to its value as a worm eradicator. After making a normal application of mowrah meal sufficient for eradicating worms, we think you will find that some additional fertilizer will help your greens. An application of some quick-acting fertilizer, such as nitrate of soda or sulfate of ammonia, at the rate of 2 or 3 pounds to 1,000 square feet, will be ample. Mowrah meal of low ash content is generally applied at the rate of 55 pounds per 1,000 square feet; for meal of high ash content a double rate of application is advised. Inasmuch as good mowrah meal is satisfactory in eradicating earthworms and does not produce any tendency to burn the grass we would regard it as a good buy at the price indicated in your letter.

**4. Excessive use of inorganic fertilizers.**—I am sending you 2 samples of turf from spots on our greens where the grass has died, and should like to have you diagnose the trouble and suggest a remedy. In places, the greens are rather poorly drained, although some of the well-drained spots are badly affected also. On the whole, however, the well-drained spots are comparatively healthy. Each green was fertilized and top-dressed as follows: May 5, top-dressed with 100 pounds of bone meal and 40 pounds of acid phosphate mixed in 1½ yards of compost; May 14, fertilized with a 12-pound mixture of 4 parts ammonium sulfate, 3 parts potassium muriate, and 3 parts sodium nitrate; June 5, fertilized

with 12 pounds ammonium sulfate; July 10, and also July 20, fertilized with a 10-pound mixture of ammonium sulfate 4 parts, potassium muriate 3 parts, and sodium nitrate 3 parts; July 25, top-dressed with 1½ yards of material containing equal proportions of sand and compost; August 14, fertilized with a 12-pound mixture of ammonium sulfate 4 parts, potassium muriate 3 parts, and sodium nitrate 3 parts; August 27, fertilized with a 12-pound mixture of ammonium sulfate 4 parts, potassium muriate 2 parts, and sodium nitrate 4 parts; September 11, fertilized with a 12-pound mixture of ammonium sulfate and sodium nitrate in equal proportions; September 12, top-dressed with 1½ yards compost in which 200 pounds of sheep manure was mixed; October 8, fertilized with a 12-pound mixture of ammonium sulfate and sodium nitrate in equal proportions. The injury to the turf was first noticed about a week after the application of the last top-dressing, which contained the sheep manure. (Minnesota.)

It is impossible to make a definite statement as to the cause of the injury to the particular samples you send. In our opinion, however, your applications of inorganic fertilizers were extremely excessive. It has been our opinion that with ordinarily good soil two applications of ammonium sulfate at the rate of 2 or 3 pounds per 1,000 square feet applied a month apart in the spring, and a third application in the fall, at the same rate, are all that can be expected to benefit the grass. In our experimental plots we recently injured some turf by heavy applications of fertilizer during the summer. Along with the ammonium sulfate we advise the use of top-dressings such as you have employed. As a general rule, when turf becomes sickly from any cause, it is well to give it a light top-dressing and a light application of ammonium sulfate.

**5. Greens for temporary play; use of swamp muck.**—We have a nine-hole course. The soil is red clay. Our greens were correctly built originally but carelessness in the method of top-dressing and general care has very nearly ruined the turf. Last fall the greens were top-dressed with about ¾ inches of swamp muck and sand. We doubt very much whether we will get 10 per cent of the old grass to grow this spring. After reading THE BULLETIN we have come to the conclusion that as good a method as any in getting them into shape is to fertilize with either steamed or raw bone meal, raking in thoroughly, and seeding with a mixture of Kentucky blue and red top. We intend to play temporary greens the first part of this season but are very anxious to be playing the permanent greens by the end of June or first of July. We also feel that eventually we wish to have our greens sown with bent seed, and had in mind that this fall we could play temporary greens again and sow our permanent greens with either South German mixed bent or Rhode Island bent. (Connecticut.)

We are inclined to think that the top-dressing of swamp muck which was given your greens last fall will not prove to be of much benefit to them; in fact, unless the muck which you used was fairly well weathered, it is quite probable that its effect will be detrimental rather than beneficial. It is always well to test muck before applying it to greens. This can be done by filling a small box with it and sowing grass seeds on it. If the young grass plants thrive in the muck the chances are that it will not prove to be toxic to greens. If the grass seedlings turn yellow after a short time, it is not advisable to use the material for a top-dressing.

We judge from your letter that you intend to do what you can to improve your greens this spring for temporary play and to remake them the coming fall. If this is the case, we think you will find a mixture of redtop and Kentucky bluegrass quite as satisfactory as any seed mixture

that you could sow; in fact, we would advise a very liberal proportion of redtop in the mixture. Redtop in the seedling stage makes very good turf, provided the plants are close enough together. It will last for a season; after that, of course it becomes thin and very unsatisfactory. Fall is the best time for sowing greens, and if you can get your green in condition for sowing next fall, we would advise you to sow either with mixed bent seed or Rhode Island bent seed.

**6. General treatment of bent greens newly planted from runners.**—Last fall we planted several new putting greens from creeping bent stolons. The stolons started growth nicely. Will you kindly outline a program to be followed next season for the best handling of these greens? (Wisconsin.)

Under normal conditions the greens should be top-dressed two or three times in the spring. It is desirable that the top-dressings should be worked down evenly into the grass each time so as to get a smooth putting surface by the time the grass is far enough advanced to permit of playing. A wire door-mat, the back of a rake, or some similar device is good for this purpose. About the last of April or early in May it is advisable to make an application of ammonium sulfate, at a rate of not to exceed 3 pounds to 1,000 square feet and to follow this with another application about the first of June. After that no more ammonium sulfate should be applied until September, unless you have brown-patch, in which case top-dressings and light applications of ammonium sulfate are advisable to hasten recovery of the turf.

**7. Seeding a polo field; Canada bluegrass.** We are writing to ask your advice on the seeding of a twelve-acre polo field. Canada bluegrass has been recommended as superior to Kentucky bluegrass on account of its supposed tougher texture and sod, and this can be purchased here at \$20 per 100 pounds. It was impossible to complete the grading and draining of the field sufficiently early to seed last fall, but two days' work will make it ready for seeding, and we are planning to sow at the earliest possible date in April fancy redtop at 80 pounds per acre, and Canada bluegrass; together with enough oats to give some shade at the start, at the rate of 120 pounds per acre. We have been assured that some method of sprinkling will be installed by spring, and so we are planning to use the field for a few practice games in July and August. The soil is clay loam indifferently well drained. (New York.)

Canada bluegrass rarely makes a good turf, and then only on certain types of soil in central regions. We would not recommend it unless there is ample evidence that Canada bluegrass will make a satisfactory turf under your conditions. Ordinarily it makes a very thin turf, and on soil that is at all good it is quickly replaced by other grasses. We would recommend that you seed your polo field to Kentucky bluegrass and redtop in the proportion of 4 pounds of the former to 1 pound of the latter. The middle of August to the middle of September is by far the best time to do your seeding. Spring sowings rarely make a knit turf during the first season, and besides the grass has much more severe competition from weeds. We take it that under your conditions you must seed in the spring. This being the case, we would advise you to seed just as early as possible. Indeed, if the ground is all prepared, it will be best to seed on top of the snow; and just as soon as the ground is dry enough in the spring, to give it a rolling. By seeding on the snow you can ordinarily save at least two weeks' time in the spring, and these early two weeks are very important in connection with the growth of grass.

You speak of using the field in July and August. We have serious

doubts whether the turf will be very well knit by that time. In other words, it is likely to be so loose that the ponies' hoofs will cut it up badly. To some extent you can help matters by crowding the grass along with fertilizer, and indeed we would advise you to do this and to use any other means practicable for securing the most vigorous growth of grass possible.

**8. Improving drainage.**—We are sending you a diagram of two of our greens with which we are having trouble. The greens were constructed and seeded down the fall of 1922, and the soil was taken from the banks of the river. Our course is situated on the banks of a river, and the whole course falls toward the river. We are seldom troubled with water, as the course seems to drain itself well. We however have no tile in the greens; in fact, we have hardly any tile on our course. Is our trouble due to improper drainage? (Illinois.)

From the looks of your diagram we are convinced that the trouble is lack of sufficient drainage. It has been our invariable experience that where high ground backs a green the seepage water from the high ground makes trouble, and the trouble can not be remedied until this seepage stream is cut off. On the attached yellow sheet we are sending you we have made what we gather from your diagram would be a cross-section of each of the greens. On this we have indicated the cross-section of the best method of remedying this difficulty; that is, to have a grassy hollow between the green and the high ground so that the seepage stream passes at least 3 feet below the surface of the putting green. A good many people have tried to cut off this seepage stream by tile placed at the base of the high ground, usually without success. Some degree of success has been reached where this grassy hollow is filled with coarse rubble and nearly to the top, but generally speaking we think a grassy hollow will open drainage at one end at least (both ends would be preferable), and this is by far the best means of remedying this seepage stream of subsurface water which tends to keep the soil soggy. We are speaking rather positively on this and without seeing the greens, because we have seen so many cases where it is nothing but this seepage stream which is the cause of the difficulty.

**9. Value and use of bone meal and potash as fertilizers.**—We understand that a good many greenkeepers use ammonium sulfate or sodium nitrate continuously on greens without giving them anything in the way of phosphorus or potash. Do you consider this wise, or do you believe it to be better practice and conducive to better results to give greens bone meal or something in the way of phosphorus? What would you advise? (Illinois.)

It is absolutely necessary for turf grasses to have some phosphorus and potash. In many soils the supply of these elements is sufficient, but where they are lacking they must be provided. It is advisable to go slowly in applying these materials, however, as they encourage the growth of clover and many weeds. An application once a year of bone meal, which contains phosphorus, at a rate not to exceed 10 pounds per 1,000 square feet of green, and muriate of potash at a rate not to exceed 3 pounds per 1,000 square feet, will insure ample supplies of these elements. It is advisable to experiment on a portion of one green to see if you get any benefit from the phosphorus or potash before treating all of your greens.

**No. 10. Measuring a putting sward.**—How do you measure the area of a putting sward in square feet? (California.)

**1. Rectangular or approximately rectangular swards.**—Multiply the length in feet by the breadth in feet. Allowance should be made for any projections from or indentations into the rectangle.

2. Circular or approximately circular swards.—Take the distance from the center of the sward to the outside and multiply it by itself. Then multiply the product by 3.1416.

3. Triangular or approximately triangular swards.—Multiply the length of one side by half the distance from the middle of that side to the tip of the triangle.

4. Oval or elliptic swards.—Add the long diameter to the short diameter, divide by 4, multiply the resulting figure by itself, and then multiply this final figure by 3.1416.

The figures thus obtained are closely approximate to the actual area. On many putting swards the area is varied more or less, usually on the side of increase, by the tendency of the greenkeepers to keep enlarging the swards at the margins. Very accurate measurements can be made by any one with the rudiments of surveying skill, but the above rules are satisfactory for general purposes.

11. **Use of peat in green construction.**—We have on hand a considerable supply of peat which we are contemplating using in the following manner in the construction of some new greens. We have however been advised by some that the use of peat in this connection is unnecessary, and by others that it is actually harmful. Will you kindly give us your opinion on the matter? We propose first to run the peat through a shredder and then mix it with clay loam and sand in the following proportion: 70 per cent peat, 20 per cent clay loam, and 10 per cent sand. In the seed bed proper we will also incorporate 200 pounds of bone meal to a green. (Minnesota.)

We think your method of using the peat is exactly right. We have seen no objection to mixing either peat or cinders with clay soil in order to loosen it up and give it more spring, but we have observed disastrous results following the use of either peat or cinders in layers. The thorough mixing of peat in the soil and subsoil we believe is advantageous.

12. **Tobacco dust and charcoal for ridding turf of ants and worms.**—It has been represented to us that tobacco dust used as a top-dressing will rid a putting green of ants, also that pulverized charcoal if used in the same way about once a year will rid a green of worms. Do you know of any detailed experiments that have been made along these lines? (Indiana.)

We have conducted experiments with tobacco dust and charcoal but have never noticed any particular benefit from their use in the way of ridding turf of ants or worms.

13. **Value of salt in exterminating weeds.**—I notice that THE BULLETIN has recommended the use of salt in the treatment of weeds and other vegetation growing in roads or sand traps. Is this in your opinion as effective as commercial weed killer? (Indiana.)

Common salt is not as effective as some of the arsenical preparations in killing weeds, but those preparations are highly poisonous and objectionable in that respect. Salt is therefore safer to use, and it will kill any vegetation if applied in sufficient strength.

14. **Top-dressing with mushroom soil.**—What is your formula for top-dressing with mushroom soil instead of manure? (New Jersey.)

It has been our experience that mushroom soil is excellent for use as compost. For your course we think it would be advisable to mix about one-third sand with the mushroom soil before using. Many people use it just as it comes, without the addition of anything else.