

scheme of hazards was out of the question; but most of the holes being more or less of the dog-leg variety, the rough made sufficient hazard to make the course quite interesting. The tract was a farm which had been in corn and potatoes. On sixty or seventy acres of pasture that is not too hilly a 9-hole course can be opened for play at even smaller expense.

No matter how small the amount of money available, it is poor policy for the club to attempt the design or improvement of its course without the services of a competent architect. An excellent idea is to have complete plans made in the beginning and let the carrying out be a matter of time and the growth of the club's resources.

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*Cornell University Establishes a Course to Train Men to Superintend Parks and Golf Courses*

Realizing the necessity of securing better trained men to superintend golf courses, especially in relation to turf matters, the Green Committee authorized its chairman to take up the matter with various agricultural colleges. The original idea was that a two-year course to high school graduates should suffice, but on further thought it was realized that to secure men skilled in such matters as soils, drainage, landscape architecture, turf growing, the use of machinery, the control of pests, etc., a more thorough training was necessary.

The idea has been adopted by Cornell University. Dean A. R. Mann, of the College of Agriculture, informs us that the course will be offered beginning the next college year.

This we regard as a great step in advance and enables us to look forward to a supply of competent men for such duties as park superintendents and managers of golf courses and country estates and for similar important functions. It is a realization of the idea that agriculture has public duties in connection with such esthetic matters as parks and with such amusements as golf, as well as with the raising of crops and livestock. There is reason to believe that other institutions will follow the splendid enterprise of Cornell.

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## 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.

1. *Our supervisor subscribes to the idea of an acid soil, but contends that we need to sweeten up the soil to give the young grass a start, and has roughly estimated 200 tons of lime. That figures at least 3 tons per acre, which is as much as is recommended for alfalfa or clover. It seems to me that this would give us a considerable crop of white clover, and a liberal use of lime at a neighboring club less than a mile away has done just that. An agriculturist friend of mine thinks we should use about 200 pounds of sulphate and 400 pounds of acid phosphate, but is of the opinion that 3 tons of lime per acre would offset the acidity of this fertilizer and absolutely guarantee the white clover nuisance. My specific question is, Do we need a sweet soil to start the grasses which thrive best later on in an acid soil? As we are now buying materials I should like your comment.*

*Our soil is a fairly heavy clay loam, and we are using a lot of cinders and horse manure to increase the porosity of it. Do you think we are apt to need potash under those conditions? L. W. E., Ohio.*

We must disagree with your supervisor with regard to the rate of application of lime. In fact, we are not at all sure that you need lime; but assuming that a normal application will do no harm, we would say put on about one ton to the acre. Presumably you have tested your soil to see whether it gives an acid reaction. Practical farm experience indicates that a ton of lime to the acre ordinarily is enough for all practical purposes. This, of course, applies only to your fairways. You will not need any lime in the rough, and we would not advise using it on your greens. As for applying sulphate of ammonia and acid phosphate, we think this might be done later to advantage. If you use well rotted manure in the soil of your greens, very little commercial fertilizer will be needed. Sulphate of ammonia can best be used as a top-dressing, unless possibly there is a chance of creating an acid condition in the soil by heavy application before the seed is sown. There is no doubt in our mind that the bents and fescues thrive on an acid soil, and that on acid soils they are better able to combat the weeds than on neutral or alkaline soils.

You ask whether it is necessary to have an alkaline soil for grass seedings. We are not prepared to state. We doubt very much that it is necessary, for since your soil is a fairly heavy clay loam a little lime will probably improve it by flocculating somewhat.

We should say, offhand, that you need no potash.

2. *I am enclosing two samples of seed on which I wish you would report. H. K. G., New York.*

The sample labeled "fancy recleaned redtop" contains 95 per cent of pure seed of redtop, some timothy, and a considerable amount of yarrow. We would consider it a very good sample of redtop, but with an unusual quantity of yarrow, which, however, is not objectionable for golf purposes. The other sample, labeled "red fescue," is apparently of New Zealand origin, and contains 95.82 per cent of pure seed with a very small quantity of redtop and rye-grass mixed. We would consider it a very good sample.

3. *Our greens were well constructed under the supervision of ———, using the proper amount of humus, etc. At the time we purchased our seed last summer it was practically impossible for us to secure bent seed, so we purchased a mixture from ———, a sample of which we are sending you under separate cover. The grass seems to be coming rather coarse, but probably will fine down some when we can roll and cut it closer and more regularly. If it develops that the seed we are using is not as fine a grade as we should use, can we incorporate finer grasses into our greens by topdressing heavily and reseeding with the better grasses? R. A. Y., Indiana.*

The seed sample consists mainly of chaff redtop—that is, the cheapest grade of redtop with considerable red fescue mixed. To speak frankly, you were swindled in this purchase of seed. The red fescue is all right, but chaff redtop is very cheap seed and, generally speaking, very undesirable for putting greens. This should illustrate to you very clearly the desirability of having the seed sample examined before you purchase, as unfortunately the statements or guarantees that many seed companies make

are not to be relied upon. There is one rather fortunate thing about the undesirable grass being redtop, namely that under putting green conditions nearly all of the redtop will disappear in one year and practically all of it in two years. Therefore by incorporating seeds of the fine bents into your greens, topdressing them at the same time, you will within a year or so be rid of the redtop and have greens composed of the fine bents.

4. *Three of our greens were completely winterkilled last winter. We must have new turf in readiness for play by July 1st, and we have no turf bed from which we can procure this. Our soil is medium heavy loam with clay sub-soil; rather acid. We would like to know whether to use Rhode Island or German Creeping Bent to re-seed; also whether nitrate of soda and acid phosphate would be the best fertilizer. E. B. P., New Hampshire.*

We are at a loss to account for the winterkilling on three of your greens unless it is due to poor drainage. It is rare, indeed, that cold alone will destroy any of our northern turf grasses. To plant seed now and secure a good putting green by July 1 is by no means easy. The best that we can recommend is that you prepare the ground immediately and seed to re-cleaned redtop seed, seeding heavily, using 5 pounds to 1000 square feet. Redtop grows more rapidly than any of the other turf grasses and young redtop makes admirable putting greens. Later it becomes rather too coarse; but it has this advantage, that most of it will die out from your putting greens at the end of the year, and practically all of it in two years. It is for this reason that we recommend the use of redtop. About September 1 you should seed South German mixed bent on top of the redtop. You understand, we are recommending redtop only because of the fact that you can get results from that more rapidly than you can from any other grass and secure satisfactory putting greens. Nitrate of soda and acid phosphate are good fertilizers for putting greens, but barnyard manure is better. Inasmuch as you have to prepare the ground, we would suggest that you have these fertilizers mixed with the soil at the time you prepare the seed bed.

5. *When I was out in California I found they were killing the Argentine ants by putting some kind of dope in a little tin can and hanging the can on the side of the tree, it being supposed that the curiosity of the ants led them to crawl around in the material, which killed them. Would a similar scheme be effective on a golf course? D. O. C., Ohio.*

The habits of the Argentine ant are entirely different from those of the ants which inhabit the northeastern portions of the United States, and for this reason the ants inhabiting lawns and golf courses in your particular region present an entirely different problem from the relations of the Argentine ant to the citrus fruit culture. The poisoning process moreover is a very slow one and is not recommended as one of the best methods of controlling the pest. The matter of poisoning our common lawn and field ants has not been very thoroughly investigated, principally because until recently they have been considered of comparatively minor importance. In point of fact, the chief objection to their presence is their habit of colonization of plant lice or aphids on various cultivated plants, including grasses. We are inclined to believe that soil fumigation presents a more promising field for investigation than the possible use of poisons to be ingested by the ants. Farmers' Bulletin No. 928, of the U. S. Depart-

ment of Agriculture, contains a popular account of the Argentine ant and methods for controlling this pest, and it would be interesting to try some of the methods of poisoning described in that bulletin.

6. *We are buying a small-power spraying machine to spray our greens whenever any work of that sort is required. Of course, the machine and the tank should be carefully washed out after each use, and if that is done can you see how any harm can arise from using the same machine to apply the different things, such as Bordeaux, sulphate of ammonia, nitrate of soda, worm destroyer, and the like? C. E. B., Ohio.*

There should be no danger whatever if the machine is thoroughly washed out immediately after using, each time it has been in operation. This should be done anyway, as it tends to prolong the life of the machine.

7. *We have several golf courses on the east coast of Florida on the greens of which courses they use northern grasses for the winter season's play only. These grasses are put in by seeding the greens in October and by January 1 they produce a pretty good turf which dies out about April 15, as at that time they are longer watered, the season for the use of the golf links being about over. These greens therefore lie idle for about seven months in the year. During this time many weed seeds naturally come in and weeds spring up which are hard to keep out of the greens during the playing season. We would like to inquire whether it would not be a good thing to put a cover-crop of some legume on these greens during the seven months when they are not in use. We would like, if possible, to obtain full information as to just what the benefits might be from such cover-crops. In this connection, it would be advisable, if the cover-crop is to be turned into the soil, to have one which would rot very thoroughly so as not to produce a lot of coarse trash which would have to be removed from the green before seeding in October. J. R. B., Florida.*

We regard the matter of plowing up these greens and planting them to legumes in the summertime as all to the good and we see no reason why it should not be entirely practicable. Probably your best legume for the purpose would be the bush velvet bean, although any of the velvet beans could be used, but will not make the mass of material, although they the whole summer season and make a great mass of material. Cowpeas could be used. The advantage of using these is that they grow through should prove very helpful. If you use velvet beans we would suggest that before they are plowed up they be practically cut to pieces with a disk and then plowed under. After plowing under the ground should be thoroughly disked so that there are not large loose places in the soil caused by the abundance of green matter plowed under. This matter really should be plowed under at least two weeks before the ground is seeded so that it becomes pretty well rotted and the soil compacted. If you do not have considerable rain, rolling will be necessary; and at any rate on the sandy loam soils rolling will do no harm. The cheapest and, under your conditions, the best seed to use for sowing on your putting greens is red-top. Bear in mind you use your greens only during the winter, and during the winter you would be putting on seedling redtop, which makes a beautiful fine turf. It is a waste of money to buy the more expensive seeds like Rhode Island bent or South German mixed bent under your conditions.