

QUESTIONS AND ANSWERS

All questions sent to the Green Section 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. 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 Section.

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.

Lime and fertilizers for Kentucky bluegrass.—Is sulphate of ammonia a good fertilizer for a bluegrass fairway? (Ohio.)

ANSWER.—We do not recommend the continued use of sulphate of ammonia on Kentucky bluegrass. Sulphate of ammonia will in time acidify the soil. Acid soil seems to be suitable for bents and fescues but tests indicate that bluegrass thrives much better on soils that are derived from limestone or are supplied with ample calcium carbonate (lime). Lime is alkaline in character, and although it may not be present in the soil in sufficient quantities to make the soil alkaline it is nevertheless necessary for bluegrass. Sulphate of ammonia and lime act in a contrary manner in their effect on the soil, and better results have been obtained with bluegrass when sulphate has not been used too frequently. Lime is not a fertilizer and hence plant food must be supplied in addition from time to time. Organic fertilizers, such as well-rotted manure, bone meal, poultry manure, cottonseed meal, and sewage sludge, have given very favorable results on Kentucky bluegrass turf.

Relative availability of the nitrogen in sulphate of ammonia and nitrate of soda.—On page 196 of the Bulletin for September, 1926, the following statement appears with regard to the nitrogen in poultry manure: "As the nitrogen is usually in the form of an ammonium compound it is a quickly acting fertilizer." We have been under the impression that the nitrogen in a nitrate compound was a quickly acting fertilizer, while in an ammonium compound it was slower in action. (Alabama.)

ANSWER.—While the nitrogen in an ammonium compound, such as sulphate of ammonia, is conceded to be a trifle more slowly available than the nitrogen in nitrate salts, such as nitrate of soda, there is really little difference. If we were to put nitrate of soda, in terms of relative availability, at 100, then sulphate of ammonia would rank from 90 to 95. In general fertilizer practice, nitrate of soda and sulphate of ammonia are considered equally desirable, other things being equal.

The principal factors entering into the cost of constructing a golf course.—In order to assist us in placing a fair estimate on what it should cost to construct a new course we should appreciate any figures you can supply on costs of constructing a number of golf courses in various locations. (Alabama.)

ANSWER.—The Green Section has not attempted to collect costs of constructing golf courses throughout the country; so many factors are involved that it would be almost impossible to apply the figures

from one course to another. In the first place, the personal factor introduced by the architect himself greatly influences the cost of construction. Some architects will choose every difficult situation on a course and will thus incur a large expense in efforts to overcome natural difficulties. Others will lay much emphasis on artificial work, thus incurring a large expense for moving dirt and similar operations. On the other hand there are architects who, realizing that the club expects a well planned golf course without indulging in too much artificial landscaping, will endeavor to take advantage of the lay of the land and on some properties will be able to plan a course which will require very little drainage, filling, or grading. Apart from the architect's plans, another personal element is involved in the construction superintendent chosen. No matter who the contractor may be, a great deal depends on the superintendent in charge of the work. No two men can work alike in landscaping, a feature which can not be as definitely provided for in specifications as can the construction of roads or buildings.

In our opinion the following figures may serve as a rough guide in estimating construction costs:

If the property is free from stone and rock and needs no clearing of timber, stones, or other obstructions, \$1,500 a hole, including tee, fairway, green, traps, and rough, should be sufficient.

In addition, the water system on a course that does not require fairway irrigation, should cost in the neighborhood of \$12,000.

Another additional cost would be involved in clearing of timber, which on the basis of 100 trees to the acre, should amount to roughly \$500 an acre. With less trees to the acre, or on old stump or brush land, the cost would be somewhat less.

Picking and removing stones from stony land, \$100 an acre and up.

Extensive property drainage problems, as well as the improving of poor soils by the addition of large quantities of manure, humus, clay, sand, or fertilizer, would need to be figured extra.

These figures are applicable only to courses laid out so that no extensive filling is required and the natural lay of the land is utilized.

For details of construction work attention is invited to the issues of the Bulletin for March, July, and August, 1928.

Improving turf on shaded areas.—On the two sides of my house where there are no trees I have developed as fine a Kentucky bluegrass lawn as one will find anywhere, but on the two sides shaded by numerous trees I can not get bluegrass to thrive. Can you give me any information that might help me to establish a turf on this shaded area? (Wisconsin.)

ANSWER.—Wherever grass grows under or near trees there is competition between the trees and the grass. Not only does the shade hold the grass back, but the roots of shallow-rooted trees and shrubs will rob the grass of much plant food and moisture. Although soil in a shady place may look cool and damp, this does not necessarily mean that it has plenty of moisture. The moisture in shady places is often not free water and hence is not available to the plants. Certain grasses thrive better than others in shady places. For your locality we would recommend a mixture of one part redtop, two parts red fescue, and three parts rough-stalked bluegrass (*Poa trivialis*), sown at the rate of 7 pounds to 1,000 square feet. If your lawn in

the shady place has been established for some time, it would be well to open up the soil by spading and raking. If necessary, the physical structure of the soil should be improved by the addition of organic material, such as well-rotted manure. Sand mixed with clay soil will also tend to make the clay more porous. Clay mixed with sandy soil will increase its capacity for retaining moisture and plant food. Such fertilizers as cottonseed meal, pulverized poultry manure, and sewage sludge can be used to advantage on established lawns, while bone meal gives splendid results when mixed in the surface soil at the time of seeding. A shady lawn that is robbed of food and moisture by trees and shrubs is usually greatly improved when watered as frequently as one waters lawns in sunny places. Turf under trees will also be greatly encouraged by spring and fall fertilizing, whereas the lawn in the sun can do nicely with only one application of fertilizer a year, preferably early in the fall.

Creeping bent in comparison with other grasses for greens; grass for tees.—We are planning to put in some more bent greens on our course. We now have a strain of creeping bent purchased from a nursery and it has proved quite satisfactory. We are advised, however, that you do not recommend bent greens any more as they have not proved satisfactory. It has also been recommended to us that we buy some German bent and start a garden for use on our tees. Is that the best bent for tees in this locality? (Illinois.)

ANSWER.—We still recommend creeping bent stolons for producing putting green turf where climatic conditions are not unfavorable, because we know of hundreds of such greens throughout the country which are entirely satisfactory. We do not claim, however, that creeping bent stolons make the only good turf for putting greens. If you have a strain on your greens which has given satisfaction, we can see no reason why you should change it. In regard to a grass for tees, we find that, as a rule, bluegrass is preferred for tees in your section of the country. The addition of a little bent frequently greatly improves the turf for that purpose, but bent alone on tees often leads to disappointment. If you wish to try German bent tees, we suggest that you change perhaps two tees to this grass and compare them with the mixture of bluegrass and bent for a couple of years before going to the expense of changing all the tees at once.

Fairway turf and acid soils.—Have you any information on the proper acidity or alkalinity for fairway soils? Do you recommend the application of lime on sour soils? (Delaware.)

ANSWER.—The degree of acidity most suitable for fairway grasses is as yet unknown. It is, however, well established that certain grasses can thrive on soils which are more acid than is desirable for other grasses. A fairway which consists chiefly of bent grass can usually be allowed to remain more acid than one in which bluegrass predominates. If you could send us a few samples of soil from various locations on your fairways and inform us as to the grasses most prevalent on your fairways, we could test the samples for acidity and might be in a position to give specific recommendations. We do not recommend the indiscriminate application of lime on so-called sour fairways. Often the so-called sour areas can be attributed to defective drainage rather than to excessive acidity.

“It is important for the public to understand that scientific progress is not a mere series of the lucky accidents and happy inspirations of a few favored individuals, but a long and toilsome process of investigation, hypotheation, and verification on the part of many workers who often follow fallacious theories and turn into blind alleys from which they have to find their way back to the highway leading toward truth.”

—OTIS W. CALDWELL.