

as the determination of pH or phosphorus. The plugs can be cut approximately 1 inch square with a knife or by means of some other device. Approximately one-quarter of the plug taken with a hole-cutter serves as a convenient sample.

A method for collecting soil samples which is convenient and provides good samples is the following: Procure a piece of 3/4-inch steel pipe and cut it approximately 6 inches long. Then sharpen one end and bore a hole through the pipe 1/2 inch from the other end. The pipe may be driven into the soil and when withdrawn will be filled with a plug to the depth desired. A tenpenny nail put through the hole at the end of the pipe will assist in withdrawing it from the soil. The plug can then be pushed out of the pipe by means of a rammer.

Each plug should be wrapped in clean waxed paper to prevent crumbling and to preserve the sample in its original condition. The type of wrapping used for coins is approximately what is desired.

If the sample is to represent a pile or bed of compost, topsoil, sand or humus it must be a thorough mixture of several individual samples taken from different places. For most purposes a small sample is satisfactory since a pint is enough for a series of tests.

Many times samples are shipped without information as to what location they are from and the kind of trouble that the soil may be causing. It is helpful if data are sent on the following points: Is the area in shade or open sunlight? Does the soil dry easily or does it tend to remain wet and soggy? What humus material has been incorporated with it? What fertilizing and liming program has been followed in recent years? Is the soil artificially drained with tile? How long has the soil been used for turf purposes?

Where testing is desired as an aid to general fertilizing or liming of all fairways or greens it usually is unnecessary to sample each one. Only the typical or representative greens or fairways on each different type of soil need be sampled. One group of plugs from each such green or fairway is sufficient. It is interesting to keep a record of tests of soil from the same areas over a period of years.

When poor areas are sampled either a composite of the poor and another of the adjoining good area should be sent, or if the injury has a definite margin the sample may be taken at a place which will include half of the one and half of the other turf. The latter type of sample may be cut out to fit a cigar box for convenience in shipping. As the healthy grass may become brown and almost completely rotted during transit, a paper marked "good" or "bad" should be pinned into each side of the sample so that there can be no uncertainty when it is inspected.

Samples are of no value unless properly labeled, securely packed and properly addressed with the return as well as the sending addresses.

At this season of the year when clubs are interested in soil tests as a guide for fall fertilizing programs the Green Section often receives many samples. These are tested in the order in which they are received and unfortunately with our limited staff some delay is unavoidable. Clubs will help us materially by having samples forwarded to us well ahead of the time information concerning the samples is required for the pur-

chase of fertilizers. The principal reasons for wanting tests made of the soil should be stated, as, for instance, thin stand, excess of clover, excessive drying in patches, yellow, unthrifty growth, etc. Any general observations similar to the above may serve to aid the person who is testing the soil in making tests other than the regular routine tests and will be of much help in interpreting results and formulating recommendations.

The Green Section is planning a series of meetings to be held in different parts of the country for general discussions of turf problems. These meetings will be sponsored by local golf associations as well as greenkeeper and professional organizations. The schedule of meetings for the next few weeks is as follows:

Cincinnati, Ohio.—Date of meeting and place to be announced by the Cincinnati Golfer's League.

Chicago, Ill.—August 31 at Mill Road Farm Golf Course, Lake Forest.

Lincoln, Neb.—September 2 at The Country Club.

Denver, Colo.—September 4 at Denver Country Club.

San Francisco, Cal.—September—Date of meeting and place to be announced later by Northern California Golf Association.

Santa Barbara, Cal.—September 14 at Valley Club of Montecito.

Los Angeles, Cal.—September 16 at Bel-Air Country Club, Beverly Hills.

Phoenix, Ariz.—September 19 at Phoenix Country Club.

Tulsa, Okla.—September 22 at Southern Hills Country Club.

Kansas City, Mo.—September 24 at Mission Hills Country Club.

St. Louis, Mo.—September 25 at Westwood Country Club.

Indianapolis, Ind.—September 28 at Highland Golf and Country Club.

Pittsburgh, Pa.—September 30 at Allegheny Country Club.

The plan in most cases is to invite all in the district who are interested in turf maintenance to assemble for lunch or dinner. Immediately afterward Dr. Monteith of the Green Section will give a talk on some phase of turf maintenance, which will be followed by a general discussion of course upkeep problems, especially those of local interest. During the afternoon the course where the meeting is to be held will, in most instances, be open to play to all who attend. The details concerning the various meetings may be obtained by consulting the local associations sponsoring them, the club at which the meeting is to be held or the Green Section office in Washington.

All who are interested in the growing of turf are invited to attend.

Dr. Monteith will spend from one to four days in each of the above districts, during which time he will visit as many courses as time will permit and discuss with representatives of clubs any turf questions in which they are particularly interested. If any club that is a member of the United States Golf Association wishes to have Dr. Monteith make such an inspection of its course during the trip, please communicate with him directly at the Washington office or make arrangements through your local organization.

PURCHASE GRASS SEED ON A BASIS OF QUALITY

THE extended drought this year has killed considerable fairway turf, making it necessary to reseed. This is the time to check up on the amount of seed that will be needed. Orders should be placed soon in order to have the seed on hand for each planting so as to take advantage of the full growing season this fall.

There may be a question as to whether to fertilize an area in order to force the surviving grass into a quick recovery or to reseed. Usually fertilizer is preferable if a scattering of plants is alive. If large patches are dead it is advisable to reseed. It is well to remember that tender seedlings have a slight chance to survive

where established plants have been struggling along only half covering the soil. It is a good rule to try the fertilizer method first if there is any doubt as to the proper manner to improve turf. In many instances best results are obtained by using both seed and fertilizer.

There are State laws governing the sale of seeds and they require that the quality of the seed shall be shown upon a label attached to the container. Such information as the purity and germination percentages, the percentage of weed seeds, and the date the seed was tested are invariably required by law. If one multiplies

the purity (per cent. of seed named in relation to total weight) by the germination (per cent. of seed named which will grow) the product is a figure somewhat much more useful than either number alone.

Suppose there are two samples of Kentucky bluegrass to choose from; the first is 80 per cent. pure and germinates 70 per cent., and the other is 90 per cent. pure and germinates 60 per cent., and both are priced the same. Which is the better one to purchase? The product is 56 per cent. for the former and 54 per cent. for the latter, making the former slightly the better buy unless the weed seed content is greater.

Assume that the 56 per cent. sample was priced at 24 cents and the 54 per cent. one at 20 cents a pound. Which one is the cheaper? By dividing 24 by 56 one gets 43 cents a pound for the pure seed that will grow in the first case and the 20 divided by 54 equals 37 cents, the real price of the seed in the second. Obviously the latter seed is the better one to purchase.

The arithmetic may seem cumbersome but it offers a way to decide a somewhat difficult choice at times. This is another reason why it is much the safest policy to purchase the seeds as individual kinds rather than the fancy-sounding branded mixtures. The State laws seldom compel the seedsman to state the proportions of a mixture and there continues to be a practice of substituting a large percentage of temporary grass for the more expensive permanent grass seed in these mixtures. If a mixture of 95 per cent. Kentucky bluegrass and 5 per cent. colonial bent is desired, then buy the seeds separately and mix them or have the seedsman do it for you.

VACUUM MACHINE FOR HARVESTING BUFFALO GRASS SEED

WESTERN CLUBS where Buffalo grass is used on fairways and lawns will be interested in a report of improved methods of harvesting the seed. The seed of this grass has been difficult to obtain and is in great demand for the planting of abandoned wheat land as a means of controlling erosion by wind and rain.

Buffalo grass has demonstrated resistance to sun and wind and the ability to make a quick comeback when conditions are favorable. Buffalo grass leads the list of grasses which can best be used to regrass this idle and eroding land. It is also the best grass for lawns and fairways in the Great Plains territory where it is adapted.

The seed is found only on female plants and grows close to the ground among the curly leaves. Harvesting with grass seed strippers, or by cutting and threshing later, as is done with other grasses, is out of the question in the case of Buffalo grass.

SEASONAL REMINDERS

Fall Fertilizing: August is the month to make plans for fall fertilizing programs. Orders for fertilizer should be placed in sufficient time to have the material delivered ready for distribution in early September. Kentucky bluegrass and the other permanent turf grasses grow vigorously during the fall months if they are provided with ample food and moisture. Some clubs are able to supply both the food and moisture for fairway turf but most clubs are still dependent on nature for fairway irrigation. The drought this summer has done much damage to turf and if it is possible to purchase fertilizer it should be applied early in September so as to take full advantage of the fall rains. Expenditures for fertilizer this season will prove to be money well spent on practically any course.

Fertilizers should be purchased primarily on the basis of their plant food content. Fortunately for golf clubs, the day is rapidly passing when fertilizers are purchased without regard to the analysis. It should be remembered that all experimental work to date on turf has shown that nitrogen is the most important plant food to be considered in the purchase of fertilizers.

Nurse grasses are usually much less of a benefit in late summer than in spring plantings; in fact, it is highly doubtful whether ryegrass and redtop are desirable in a fairway mixture for August and early September planting.

The best test of what the mixture should contain is to find out what kinds of permanent grass the fairway contains now. If it is impossible to identify the grasses personally, someone who can do this should be found. Samples of the various grasses will be identified by the Green Section. Kentucky bluegrass is usually the major grass in the North except in New England and New York. Fescue also may be found and, if so, it should be included. A small proportion of colonial bent has been found to be beneficial in practically all northern fairway mixtures, and in New England it is the mainstay.

A fairway mixture that is widely adapted is Kentucky bluegrass from 90 to 95 per cent., and colonial bent from 10 to 5 per cent. A good mixture is Kentucky bluegrass 75 per cent., Chewings fescue 20 per cent., and colonial bent 5 per cent.

Dry knolls difficult to cover with grass should be spiked or disked in order to prevent the seed from being washed or blown away and to provide better conditions for germination. Although the spiking is by no means a perfect method, it is helpful in placing the seeds where they would be expected to find moisture and where they will not easily be washed away. A seeder similar to the grain drill but with less space between disks would probably give the best results.

A new suction machine built like a powerful vacuum sweeper has been developed by the Kansas State College and the Experiment Station at Hays. It has collected as high as 95 per cent. of the seed, or an average collection of about 64 per cent.

The collecting nozzle in the most successful models is about 6 feet long and 4 inches wide. A light chain dragging ahead of the nozzle loosens the seed from the stems or from the dirt where it may be slightly imbedded. Best results are obtained when the grass is closely clipped before the seed is collected. The most seed can be collected in the late summer or fall.

Buffalo grass also may be propagated vegetatively by scattering pieces of sod. The method of propagating Buffalo grass by this latter method is described in The Bulletin of the United States Golf Association Green Section, Vol. 13, p. 144.

In most golf course formulas, therefore, the nitrogen component should lead by a big margin. Phosphoric acid and potash, which are of great importance in many agricultural crops, are of less relative importance in golf turf fertilization.

Soil Samples: August is a good month in which to sample soils for testing as an aid in deciding upon the best fertilizer programs. If laboratory tests have not been made recently it would be well to have some made before deciding on the fall fertilizing program. The Green Section will be glad to make such tests for any club that is a member of the United States Golf Association. Samples should be collected and shipped as directed elsewhere in this publication. Examinations will be made as promptly as possible, and as complete reports and recommendations as are justified from the samples will be submitted to the club. We promise no elaborate tests nor exaggerated deductions.

Use of Lime: This is the best season to determine the need for lime in turf. Laboratory tests will serve as a useful guide in determining whether soil is ex-