

## New Agricultural Bulletins Applying to Golf Course Problems

Many of the bulletins issued by the State agricultural experiment stations and the United States Department of Agriculture have much of value and interest for those responsible for the care of the golf course. Below are given brief reviews of some recent publications of this type. If any of our readers seek further information on the subjects covered in the bulletins they may obtain copies of the bulletins on request from the authors or the institutions which issue them.

### "THE PERSISTENCE OF CERTAIN LAWN GRASSES AS AFFECTED BY FERTILIZATION AND COMPETITION"

This is the title of Bulletin 217 of the Agricultural Experiment Station, Kingston, R. I. The authors are E. S. Garner and S. C. Damon. The bulletin gives recent observations and an interpretation of results on the turf plots at the station, which was a pioneer in investigation of turf in this country. The grass plots at the Rhode Island station were started in 1905, long before golf turf problems had aroused much popular notice. The early observations on these plots led to the conclusion that soil acidity was an important factor in controlling troublesome weeds in turf and was largely responsible for the widespread use of sulphate of ammonia in turf culture in this country. The authors summarize the results of their studies as follows:

"The data contained are critically examined and afford evidence that—

"The fertilizers given have been effective in producing healthy turf and a wide range of H-ion concentration.

"The bent grasses are particularly tolerant of an acid-soil reaction.

"Kentucky bluegrass does not persist as well as the acclimated bent grasses, especially under conditions of relatively high soil acidity.

"Red fescue and fine-leaved fescue are exceptionally durable grasses in alkaline as well as in acid soils.

"Redtop and crested dog's-tail are short-lived under acid or alkaline lawn conditions.

"Acclimated velvet bent is an aggressive and persistent species and an excellent lawn grass.

"Without top-dressing, certain strains of creeping bent show a marked tendency to 'run out' after a few years under New England conditions.

"The number of weeds persisting is in inverse ratio to the degree of acidity; the higher the acidity the fewer the weeds.

"White clover volunteers most freely in soil having a slightly acid reaction."

### "TRANSPLANTING TREES AND SHRUBS"

This is the title of Farmers' Bulletin 1591 issued by the United States Department of Agriculture. It was written by F. L. Mulford, of the office of horticultural crops and diseases, Bureau of Plant Industry. The bulletin deals with the care and methods used in transplanting trees and shrubs, both deciduous and evergreen. Such a bulletin should be useful in any greenkeeping library, since the moving of trees and shrubs is a common task about golf courses, and

all too frequently the work shows every evidence of absence of information on the subject or lack of interest. As pointed out in the bulletin, "transplanting trees and shrubs is a means of quickly transforming natural desolation and that brought about by human operations into attractive scenes." If work is poorly done the expenditures for the work may be in vain; and in addition to the money losses there is the serious loss of time. Various methods of handling must be employed with different types and sizes of plants as soil conditions vary. Mechanical helps, such as derricks, pulleys, and jacks, are advisable for large plants. The following considerations, according to the bulletin, are essential for success in the transplanting of trees and shrubs.

"A good plant, including a well-developed root system and a healthy top.

"Moving at the proper season: deciduous plants while dormant; evergreens when the ground is sufficiently warm and moist to stimulate the plant to the immediate formation of roots.

"Proper digging: dormant deciduous plants to be dug with a minimum of injury to the roots, but without soil; evergreens with a ball of earth about the roots.

"Well-protected roots; that is, kept covered and moist, and the ball, if any, unbroken.

"An adequate hole, wider and deeper than the spread of the roots.

"Proper setting: set at the depth at which it formerly grew, with the roots well spread.

"Suitable soil as to moisture, texture, and fertility.

"Correct planting: the soil to be brought into close contact with the roots.

"Top pruning, to balance the loss of roots or other injury.

"Maintenance of adequate soil moisture until the plant is reestablished."

#### "BETTER LAWNS"

Under this title the Ohio Agricultural Experiment Station, Wooster, Ohio, has recently issued Special Circular 18, by F. A. Welton and R. M. Salter. The circular contains instructions on the building and maintenance of lawns. The discussion appears under four main headings, (1) establishing a new lawn, (2) maintenance of turf, (3) rejuvenation of old lawns, and (4) pests. Advice is given on the subject of grading a new lawn, its drainage, preparation of its soil, its fertilization, and the tools useful in these operations. There is also a discussion of various standard seed mixtures suitable for lawns both in sandy and in shaded locations. It is pointed out that weeds and grasses are responsive to soil reaction, and suggestions are made as to the suitable soil reaction for success with different lawn grasses. Special treatment is recommended for the extremely sandy soils often found in the lake ridges of a State. It is pointed out that commercial seed mixtures are apt to be badly contaminated with weeds and worthless grass seed, although it is stated that "satisfactory results may be obtained from the use of ready-mixed seeds providing care is exercised to purchase them from reliable firms." Advice is given as to the time, rate, and method of seeding. There is a short discussion of creeping bent, in which it is pointed out that creeping bent although suitable for lawns under special conditions is not recommended for ordinary use.

In a discussion of the maintenance of turf, a mixed fertilizer of approximately a 10-6-4 analysis is recommended. Compost is recommended for grass and suggestions are made for using leaves and waste material for the compost pile. Lime is recommended only where the soil is acid. It is pointed out that "on the limestone soils of western Ohio, it is seldom if ever that lawns need the addition of lime." Where the soil is naturally acid it is stated that "an application of 25 pounds of hydrated lime or double this quantity of finely pulverized limestone to 1,000 square feet once every 5 or 6 years is sufficient." Rolling is recommended in the spring. It is pointed out that grass should not be cut too short, especially in dry weather and in early spring and late fall. Clippings should be left on turf except in shady and damp situations. An application of "water in liberal quantities at intervals of several days, rather than in light and frequent applications," is recommended.

Advice is given as to the best methods of rejuvenating old lawns. It is pointed out that this can not be accomplished in a short time and that "two or three years, even, may elapse before a satisfactory turf can be reestablished." It is explained that the rejuvenation of old turf involves three steps, "(1) elimination of weeds, (2) liberal fertilization, and (3) reseeding." Each step is explained in the circular.

Suggestions are also given on the control of four common lawn pests. Carbon bisulfide treatment is recommended for ants; arsenate of lead for the control of grubs; cyanide of calcium, carbon bisulfide, or trapping for the control of moles; and bichloride of mercury or arsenate of lead for the control of earthworms.

#### "ARTIFICIAL MANURE FROM STRAW"

The New York State Agricultural Experiment Station, Geneva, N. Y., has recently issued its Bulletin 573 under this title. The authors are R. C. Collison and H. J. Conn.

On many golf courses there are large quantities of hay, leaves, and other refuse which are usually burned or hauled away. The golf club officials frequently inquire as to whether this material can not be profitably used as organic matter for compost. Different methods have been tested out in recent years for decomposing waste material, particularly straw. The bulletin here referred to deals with the problem of decomposing piles of straw to form artificial manure. Although the authors of the bulletin conclude that this method is not an economical one for farms in New York due to certain requirements, especially that of the large water supply that is necessary, the system might nevertheless be practical on certain golf courses. Those who are associated with clubs where grass and leaves are regarded as a nuisance would do well to obtain a copy of the bulletin and test for themselves the practicability of the method. It also contains detailed descriptions of the various raw materials, decomposing chemicals, and methods of composting used in the experiments. The results are summarized in an introductory abstract, from which we quote:

"For some years investigations have been under way at this station concerning the injury to plants caused by the presence of cereal straw in the soil or other medium in which the plants are growing. The most recent work has been concerned with methods of treating

straw to overcome this injurious effect. While these investigations were in progress, an English method was announced which, it was claimed, would rot straw quickly to an artificial manure. This method, together with a simple fertilizer mixture which had already been used for the same purpose, was used to rot straw in these experiments. Both methods, in about three months, rotted the straw to a point where no injurious effect was noted on the growth of plants. The investigations indicated, however, that the labor involved, the large water supply necessary, and the cost made it questionable if the method would be practical under average farm conditions, at least in New York. Where the necessary requirements mentioned can be met, the method is worth a trial. Cutting down labor and water supply by depending on natural rainfall was not successful in producing a good grade of 'artificial manure' within a reasonable time."

#### "FACTS ON LAWN MANAGEMENT"

This is the title of Extension Leaflet 85, issued by the Extension Service, Massachusetts Agricultural College, Amherst, Mass. The author is L. S. Dickinson. The leaflet gives advice on the management of lawns both from the standpoint of construction and maintenance.

In discussing the subject of construction the importance of the foundation and subsoil is stressed since these not only furnish the means of escape of excess water but also should hold a quantity of water in reserve for dry periods. A layer of a 5-inch depth of good top soil should be used. Some detailed advice is given on the subjects of preparation of the seed bed, seed, and seeding. Tables are given showing the grass seed found in typical lawn grass mixtures. Different rates for mixing seed of different grasses used on good soil, sandy soil, and shady locations are given.

It is pointed out that "it is far better and cheaper to restore to a good condition a poor lawn than to rebuild it, especially if there is some good grass already growing." A list of fertilizers is given, with notes on their rate of application and effect on turf. It is advised that clippings be left on lawns, and that the mowers be raised during dry weather. A thorough soaking once in six or eight days is advised in preference to short and daily sprinklings. It is advised that grass go into the winter rather long and that it be raked thoroughly and rolled in the spring. Suggestions are also given on the control of ants, moles, earthworms, dandelions, and crab grass.

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**To measure the area of a putting green:** If rectangular, multiply the length by the breadth.

If circular, multiply the square of the radius by 3.1416.

If triangular, multiply the length of one side by half the distance from the middle of that side to the tip of the triangle.

If oval, 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.

After allowances are made for the areas of indentations, projections, or other irregularities of the green, the figures obtained will closely approximate the area of the green.