

fairway. The stone drain catches the water and seepage. The tile across the fairway carries off the water. The effect produced was so cheering that we put in three systems across that particular fairway. We have had such a success that all of the players have congratulated me, and the work done has made them very happy. The system has been tested out by several very hard storms, and the drains are working splendidly. This is a comparatively inexpensive way of doing it, and it certainly brings results."—*Elliot D. Pierce, Greenkeeper, Kittansett Club, Marion, Mass., May 21, 1924.*

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## Suggestions for Making Compost

By R. A. Oakley

Regardless of whether you are contemplating any unusual work on your greens this summer or fall, you will need a liberal supply of compost to put and keep them in first-class condition. If you are to do much new sowing, or if you intend to use the vegetative method of planting creeping bent this fall, you will need a very considerable quantity of compost. The time to start with your preparation is now. Don't put it off because you do not have just the kind of manure or other organic matter you think should be used. Don't put off the making of a compost pile just because you think the only manure you can get at a reasonable price is coarse and full of straw and weed seeds. Both weed seeds and straw will decay in a relatively short time, if properly treated. The kind of treatment to give compost is important. In some respects quite as much so as the materials included in it.

If a supply of good manure or mushroom soil is available, the question of making compost is a simple one. If neither of these materials can be had, then the problem is, How can a good quality of compost be made without them? Straw and coarse manure are commonly available where well-rotted manure or mushroom soil are difficult to obtain. It is intended here to suggest a means of treating straw and coarse manure so that they may be converted into very valuable material for top-dressing greens or covering bent stolons at the time of planting. THE BULLETIN for February, 1922 (page 36), contains a brief discussion of a method of rotting straw quickly and thereby rendering it suitable as an ingredient of compost. The method was devised by the Rothamsted Experiment Station and may be described briefly as follows: To each ton of dry straw used in the making of compost add 100 pounds of ammonium sulfate and moisten thoroughly. Keep the straw moistened until the fermentation or rotting is well under way, and then mix with loam or clay loam as in the making of compost with manure. The whole mixture then should be kept moist and worked over occasionally. The Rothamsted investigators advise the addition of lime to the ammonium sulfate and straw, but experiments conducted here in a crude way indicate that lime is not necessary, and where compost is to be used on putting greens, especially on bents or fescue, it is not desirable. Since the publication by the Rothamsted Experiment Station of this method of converting straw and similar vegetable matter into a form approximating barnyard manure, at least one concern in England has attempted to commercialize it. Doubtless the method used by this concern involves some modifications of the simple one here described.

There are some points in the making of compost by the Rothamsted method that should be considered carefully. These are as follows: (1) In determining the quantity of ammonium sulfate to use, be sure to estimate the straw or other organic matter on a dry basis, keeping in mind that a ton of ordinary straw and manure is equal to little more than one-fourth of a ton of dry straw. (2) Keep the compost pile moist and work it over two or three times during the season. (3) After the compost has rotted sufficiently and is screened and ready for use on the greens, do not forget that ammonium sulfate was included at the time the pile was started. Make allowance for this when adding ammonium sulfate to the screened compost before applying it.

A little experimenting with the ammonium sulfate method should enable any club to use it advantageously. It will surely aid in making available for composting a supply of organic matter that would otherwise be regarded as unfit. Furthermore, it has other good points. One which should be mentioned specifically is that it hastens the devitalization of weed seeds in the compost pile.

In the minds of many persons, weed seeds in manure make it thoroughly taboo. The thought of weed seeds has done more to deter the making of compost than any other single factor outside of sheer carelessness and neglect, and where it has not been offered as a legitimate reason for not making compost it has been used as an excuse. In the first place there are relatively few kinds of weed seeds carried in manure that really cause trouble when they germinate on putting greens. Most of them produce seeds of weeds that are naturally tall growing and will not live under putting green conditions. There are some of course that cause trouble. Crab grass is one of them, but crab grass seed in manure is relatively quickly devitalized in the compost pile; and this brings up the point desired to be established. The devitalization or killing of weed seeds in manure is easily accomplished by composting. This statement is not based on hearsay or guesswork, but on actual investigations. The whole question will be discussed in full at some later date; but if you are a bit curious about it, take a representative sample from your compost pile that has been in existence for three months, put it in a tray and keep it moist and warm. Then note the number of noxious weed seedlings that appear. Repeat the experiment with a sample from the same pile after it has stood six months. After you have done this the chances are that you will be less inclined to blame your compost for the presence of weeds in your greens.

Another suggestion for the making of compost involves the use of green or freshly cut vegetable matter. On almost every golf course there are tall-growing weeds or plants of some kind growing in places where they can be cut with a side-bar mower or a scythe. Sometimes a patch of sweet clover is present. It is an easy matter to rake up this material and haul it to the compost pile. If properly layered with soil and treated as though it were manure, it will make a good quality of compost. Again, don't be unduly afraid of weed seeds.

While the conclusion that the proper kind of organic matter is not available and the fear that the weed seeds may be introduced have deterred many from making compost, quite a number of clubs have delayed making it because it was felt that not enough organic matter was available for the making of compost of suitable quality. It is indeed an exceptional case where a sufficient quantity of organic matter can not be had to make

compost that will be highly useful in maintaining putting green turf. In fact, the present tendency seems to be in the direction of too much manure.

Probably the ideal compost pile should start off with organic matter, at the rate of the equivalent of one part of good manure to three parts of soil, to be composed of loam or clay loam, and sand, in the proportions required by the soil of the greens to which the compost is to be applied. The more clay in the soil of the green, the less sand, and vice versa. As it is screened and ready to apply to the greens, the compost that is now being used at the Arlington Experiment Farm on bent turf on stiff clay soil, by actual analysis contains approximately only 6 per cent of organic matter on a moisture basis equivalent to that of ordinary manure. An analysis of a sample of compost now in use on the greens of the Merion Cricket Club, Philadelphia, was found to contain 8 per cent. Bear in mind that it is easily possible to include too much manure or organic matter in compost, and that good results may be obtained with even a very small percentage. To sum up this feature of the subject, compost poor in organic matter is better than no compost at all, if the proper proportions of loam, clay loam, and sand are used.

While it is not intended here to discuss the effect of compost when applied as a top-dressing to turf, the rate of application is of such importance as to justify a brief reference at this time. Recommendations or instructions have usually been given in terms of depth of application. This is an exceedingly indefinite matter. No two individuals will make estimates of a depth of application of compost anywhere nearly alike. The best way to get at it is to make an application that appears to be suitable, then measure the area, and estimate the quantity of material applied. In experiments at Arlington it has been found that for regular treatments of creeping bent turf, 1 cubic yard of screened compost is sufficient to top-dress 5,000 square feet of turf. For covering bent stolons at the time of planting, 1½ cubic yards of screened compost are necessary for 1,000 square feet of planted surface. You may not agree with the rates here suggested, but surely you will agree that this is the proper way of stating the rate of application.

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## Some U. S. Golf Association Decisions on the Rules of Golf

QUESTION.—One of our subscribers has recently raised the following question based on Rules 31 and 20. Suppose that in a single match both players are using the same make of ball. They reach the putting green, and A, assuming that the ball farther away from the hole is his, plays it and holes out. He goes forward to the hole and picks up the ball, and then discovers that he has played B's ball. Now the question is, Does the statement printed below the footnote to Rule 20, which says, "On the putting green, the ball shall be replaced," mean that B's ball must be replaced and that the hole is then played out in the proper order without any penalty, or does this statement emphasize only the fact that on the putting green the ball is to be replaced instead of dropped, according to the provisions of Rule 20? From the manner in which Rule 20 and the statement above mentioned are printed in the rules, I have taken it that the ball must be replaced and played on the putting green. In addition to this consideration, it would appear to me that it would be fair to replace the ball, since the opponent is put to no disadvantage on the putting green, where the mistake may readily be discovered.