

STUDY OF THEORY SUGGESTS Composting Practice IS DUE FOR MUCH REVISION

By B. R. LEACH

AN adequate supply of suitable top dressing material is one of the most important of modern golf course essentials, but the present day methods of preparing topdressing, employing the compost pile method, is both laborious and expensive while the quality of the product obtained is not always of the best, as I shall proceed to show.

Let us consider for a moment the theory of composting. Composting, in the last analysis, consists in heaping together a mixture of animal manure or vegetable matter and soil, the ingredients in varying proportions with the object of inducing decomposition thereby rendering the mass homogeneous and of such a condition that it will be conducive to the growth of plants. Composting has been practiced for centuries not only by greenkeepers but by florists, nurserymen and gardeners. Greenkeepers still cling to the compost pile but the method is rapidly going out of use among florists and nurserymen, first because the method is unduly laborious and secondly because it has been found that there is a much cheaper and easier method and that the product obtained thereby is much more suitable for the purpose intended.

One would off-handedly suppose that the composting method should produce a topdressing mixture just about right for application to the greens when mixed with additional soil, but as a matter of fact this is not so. In the first place, a compost pile rarely possesses the proper moisture content for rapid decomposition, first because the rain runs off it regardless of how it is built, and secondly it dries out much more rapidly because it has a greater surface exposed to the wind. If a compost pile once gets on the dry side it is a Herculean task to again work it into a properly moist condition. Furthermore, and decidedly of the greater importance, is the fact that the type of decomposition which goes on in a compost pile is not of a satis-

factory nature and the product of this decomposition is not the best material for topdressing greens.

I have traveled around a goodish bit in my time, but come to think of it I have never seen a compost pile in nature. The compost pile is a man made institution, a sort of vain attempt to paint the lily and perfume the rose, and is not so hot. When nature is desirous of decomposing animal or vegetable matter she doesn't heap it up in a pile. Rather she spreads it out in a thin layer on the surface of the soil as for instance the thin carpet of fallen leaves in the forest or the mat of last year's dead grass stalks in a meadow.

In the decomposition of the compost pile or the decomposition of the leaves in the woods the active agents of decomposition are in both cases bacteria, but they are not the same type of bacteria. The bacteria responsible for the decay of leaves in the woods are known as *aerobic* bacteria, or as the name implies, they act on organic matter only when there is an abundance of oxygen available to them as would be the case in the thin layer of leaves in the woods. A compost pile, on the other hand, will contain aerobic bacteria of those outer portions of the pile where this type of bacteria can obtain adequate supplies of air for their proper functioning, but the proportionally greater internal bulk of the pile will be insufficiently supplied with the aerobic bacteria for the plain and simple reason that there is not sufficient oxygen containing air present therein for the aerobic bacteria to function properly.

Nevertheless decomposition does occur within the internal masses of a compost pile, but it is an entirely different type of decomposition. Under these conditions, with an inadequate supply of air to contend with the aerobic bacteria give way to another type of bacteria known as *anaerobic* bacteria or in other words bacteria capable of functioning in an atmosphere practically devoid of oxygen.



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Now, in an off-hand manner the average hard-boiled citizen may dismiss all this distinction with a wave of the hand and a wide yawn, but the thinking greenkeeper will listen to Daddy while he does a little more explaining. In the first place, rotted manure or vegetable matter may all look alike, but believe me there's a difference from the plant growing angle.

Let us first consider the nature of rotted organic matter obtained as the result of the action of aerobic bacteria; that is, the type which works in an atmosphere well supplied with oxygen. Under these conditions decomposition goes on until all the heat of decomposition is given off. In other words, the organic matter unites with the oxygen of the air and the ultimate product is a grade of humus virtually free from animal heat and of immediate use to plants.

The humus obtained as a result of the decomposition of organic matter by anaerobic bacteria in the virtual absence of oxygen is, on the other hand, of an entirely different nature. Under these conditions the decomposition never goes to that state of completion desirable for humus intended for greens. The organic matter is only partially decomposed, and at this state of the decomposition it may contain undesirable toxins; that is, compounds of a poisonous or semi-poisonous nature. When compost of this sort is applied to greens the oxygen of the air unites with these toxic products and neutralizes them, but in the meantime they are not enhancing the turf to any extent and may prove detrimental for the time being.

Of interest in this connection are the perennial arguments waxing pro and con as regards the merits and demerits of the various types of bog peat which has been erroneously labeled humus. The word humus applied to a peat is erroneous. It isn't humus in any sense of the word. It is simply peat and nothing but peat. Peat is a sterling example of the product resulting from the action of anaerobic bacteria working in an atmosphere lacking in oxygen. Freshly removed from the bog it is often so loaded with toxins that when applied to a green it will frequently cause serious damage. It is therefore customary to expose this material to the air for a considerable period of time before applying it to turf. During this exposure to the air the oxygen works on these toxic compounds and neutralizes them, thereby rendering them harmless.

Such properly weathered peat may be applied to a green with impunity as far as the possibility of injury to the turf is concerned, but on the other hand it will result in no benefit to the grass or to the soil because the organic matter present in peat is in a sort of semi-petrified condition and resists stoutly the decomposing action of the oxygen, bacteria, water, etc., of the ordinary soil type and especially an acid soil.

Weathered peat may be very aptly compared to a half-baked potato. The reaction of a traveling salesman who cuts into a 40 cent baked potato on a dining car only to find it raw in the center is exactly the same as the reaction of turf to peat. Both are only half-cooked and before the peat is of any value to turf the cooking must be completed.

For many years the owners of peat bogs have frothed at the mouth because the technical highbrows of the golf course maintenance racket have steadfastly refused to countenance the application of bog peat to turf.

Technical men have taken this stand simply because bog peat, as stated above, is only half baked, in the sense of the comparison with the potato and until such time as bog peat can be treated in such a way that the resulting product is of immediate value as a soil conditioner for turf the owners of peat bogs are out of luck. I believe the era of bog peat transformation or modification into organic matter suitable for soil is much nearer at hand than is commonly supposed. The ever diminishing supply of animal manure and the crying need for organic matter by nearly all soils will bring about the ultimate exploitation of bog peat in due season. In the meantime it offers little from the standpoint of efficient turf maintenance.

Laborious and expensive though the compost pile method of producing topdressing material may be it is nevertheless not exactly a safe bet to assume that any fertilizer mixture will take the place of the product of the compost pile as a topdressing material for greens. Nor do the various brands of commercial so-called "humus" offer a satisfactory solution of the problem. Nevertheless there does exist a simple, easy, inexpensive and practical system of manufacturing adequate amounts of topdressing material. Furthermore this method is not in the experimental stage

because it has been used extensively by florists and nurserymen for several years.

The method in brief consists in taking a small piece of land, enriching it for one or at most two growing seasons by means of cover crops, fertilizer and if possible manure until the soil is rich as cream and in perfect physical condition. At the end of this period you can skim off three inches of the surface soil, run it through a screen and it is ready for the greens. In a future article I will discuss the "soiling" method of producing topdressing in detail and furnish pertinent reasons as to why it will ultimately render the compost pile as extinct as the Australian Dodo.

GREENKEEPING PROBLEMS

in

LEACH'S MAIL BAG

Sir:

Have you any information regarding use of Double Duty Tobacco Fertilizers on putting greens.

C. H. B. (Illinois).

Answer.

Sir:

Have had no experience with "double duty tobacco fertilizers" as such but would advise that tobacco dust and refuse in general can be applied to turf with impunity. Usually, however, it is rather expensive as a fertilizer when compared with other sources of nitrogen such as ammonium sulfate, etc.

B. R. Leach.

Sir:

I am enclosing one pair of beetles which I hope very much are what we call in this section June Bugs, and not the Japanese Beetle.

For the first time our golf course has quantities of these beetles on the greens and fairways. I suppose the best method of treatment is spraying with arsenate of lead, but I am rather uncertain as to the best time to spray.

H. L., (Illinois).

Answer.

Sir:

The beetles forwarded under separate cover are your native May beetles. Arsen-