

Top-Dressing

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Greenkeepers are not entirely in accord with regard to the matter of top-dressing. While the practice is steadily growing in favor and more golf courses have compost piles in the making than ever before, there are some skeptics who feel that the matter is being carried too far and that dire results are happening or are going to happen to the greens from such treatment. Some of the members of the Green Section have suggested that a historical and theoretical account of top-dressing might be advisable. It is in response to that suggestion that the following article has been prepared.

The top-dressing of grasslands is a very ancient farm practice. The Romans appreciated the value of manures and used them freely. Columella, who lived during the first century A. D., described fully the common animal manures and their relative values, and adds, "Nor am I ignorant that there is a certain kind of land, and some places in the country wherein neither cattle nor fowls can be kept; yet it is a sign of a slothful husbandman, even in such a place as that, to be destitute of dung; for he may amass and put together any kind of leaves, and collections of any other things, out of thickets and highways; he may cut down ferns, without doing any injury to his neighbor; yea, he may even do him service by it, and mix them thoroughly with dirt and sweepings of the courtyard; he may sink a pit, such as we directed to be made in our first book, for laying up dung in, and gather into it, in one heap, ashes and dirt of the kennels, sinks, and common sewers; straw and stubble, and other things that are swept out of the house."

There is no evidence that the old Roman had motorized golf courses in mind when he wrote this, but many greenkeepers are now practicing methods which agree quite closely with the recommendations which he gave. No information has come down to us to show whether the farmers in any of the civilizations earlier than the Roman practiced top-dressing or not. The Roman methods of farming were adopted by many neighboring peoples and had a very pronounced influence on European agriculture. The Roman agricultural writers were widely quoted during the sixteenth century in the northern European countries, where the old Greek and Roman classics were looked upon as the fountain heads of all worth-while knowledge.

A quotation from Hartlib's *Legacie*, which was published at London in 1651, is illustrative. "An old writer (Columella) saith that his Grandfather used to carry sand on clay, and on the contrary to bring clay on sandy grounds and with good success, the Lord Bacon thinking much good may be done thereby; for if Chalke be good for loamy land, why should not loame be good for chalky bankes." Hartlib also asserts that "all things that will rot, if they were stones, would be dung." English and French agricultural writers after the time of Hartlib continued to advocate the use of compost for top-dressings, especially for grassland. Each particular writer favored certain materials, just as greenkeepers today have their individual preferences for this or that fertilizer. Some favored muck from swamps; some, rich loam; some, composts of manure and soil; while others, probably from observing the vigorous growth along highways,

strongly recommended the use of dust of roadways. Barnyard manure, then as now, was known to be very helpful to growing plants.

These agricultural writers had rather vague and woozy theories in regard to the reasons for the beneficial effects of these materials, but all seemed to agree that there was great virtue in the mixing together of different kinds of soil. "Clay on sand and sand on clay" was a catchy slogan used over and over again. Mortimer in 1707 says, "As Clays are an improvement to Sand, so Sand by the same reason is an advantage to cold Clays, in that it warms them, and unlocks their binding quality."

These old English farmers went to great trouble to procure their favorite manure. Another quotation from Mortimer is an instance: "Soot also is very good both for Corn (any grain crop) and Grass, especially what grows on cold Clays or Lands much run over with Moss; but Sea-coal Soot is the best by much. They commonly allow 40 Bushels to an Acre, but some Lands will require more: It produces a mighty fine sweet Grass, and destroys Weeds and Trumpery. Wool-nippings and tarred hempen Roaps cut small, and untwisted, are beneficial for Land. Raggs are a very great improvement of Chalky binding Lands. (Clays) Many Loads of them are fetched from London to Dunstable which is 30 Miles, only to lay on their Lands. They cost about 4d. per Bushel at London. They chop them very small and sow them just after the sowing of the Corn, allowing 4 Sacks to an Acre, each Sack containing 6 Bushels."

The Europeans who settled America came imbued with European farming methods including top-dressing. The New Englanders near the coast adopted the Indian method of fertilizing with fish, but in the middle colonies of New York, New Jersey, and Pennsylvania, where fish were not available, manuring and top-dressing with soils and composts were in common practice. Woods earth and soils from ditch banks were favorite materials. In New Jersey the greensand marls were hauled long distances for farm use.

Deane (1790), one of the earliest agricultural writers after the American Revolution, says:

"Composts ought to be different according to the different soils on which they are to be laid. A soil that is light and loose requires a compost that is heavy, or one which has a large proportion of the mud of deep ditches, swamps, or ponds, and cow dung. Clayey and heavy lands require a compost, in which something that is light and warm predominates, as lime, the dung of horses and sheep, etc.

"Composts may be made of common earth, turfs, the dirt of streets, straw, mud, together with dung, lime, marle, ashes, weeds, salt, or oily substances, and any kind of animal or vegetable matters. They should be well mixed, and lie one year, one summer at least, in heaps, and be several times shoveled over to promote fermentation and putrefaction.

"They should be kept, if practicable, in a temperate degree of moisture. If they lie too wet, they will turn sour, and not putrefy; if too dry, there will be no fermentation at all. * * *

"A compost of clay, turf, ditch-earth, with lime, soot, or ashes, is an excellent dressing for grasslands. The time to lay it on is in autumn. Neither would it be amiss to do it in the spring; only as carting it on would be apt to injure the surface when it is wet and soft."

A visitor in 1769 to John Bartram, a colonial Quaker farmer who has the honor of having started, about 1730, near Philadelphia, the first botanical garden in America, gives us this information: "He next showed me his orchard, formerly planted on a barren sandy soil, but long since con-

verted into one of the richest spots in that vicinage. 'This,' said he, 'is altogether the fruit of my own contrivance. I purchased some years ago the privilege of a small spring, about a mile and a half from hence, which at a considerable expense I have brought to this reservoir; therein I throw old lime, ashes, horse dung, etc., and twice a week I let it run, thus impregnated. I regularly spread on this straw, and whatever damaged fodder I have about my barn. By these simple means I mow one year with another fifty-three hundreds of excellent hay per acre, from a soil which scarcely produced five-fingers (a weed). * * * With the banks of my meadow ditches, I have greatly enriched my upland fields * * *. When I want to break up my clover fields, I give them a good coat of mud, which hath been exposed to the severities of three or four of our winters.' "

This history is given for the reason that no better proof can be advanced that an agricultural method possesses merit than that it has been in general use by farmers over a long period of time.

The general practice of top-dressing with composts and soils in European countries and America declined less than one hundred years ago. It is worth noting, however, that the farmers of Japan and China still rely on this means of maintaining the productivity of lands which have been farmed for at least forty centuries.

The first influential writer to discredit the old custom of top-dressing



Spreading Compost on Grass Turf

was Jethro Tull, of England, about 1740. Tull was a pioneer advocate of tillage in England, notwithstanding the methods of farming which he advocated had then been practiced by the white farmers in America for more than a hundred years and by the American Indians for untold centuries before. The main feature of the "Tullian System" was thorough working of the soil. Tull preached that tillage was manure and that any soil would be productive if its particles were in a sufficiently fine state of subdivision. He invented the first grain drill, designed to put wheat and other small grains in drills so that they might be cultivated; also several "horse-hoes," the beginnings of modern cultivators.

The next shock to the top-dressing practice came from Germany. Baron von Liebig, one of the greatest of the early nineteenth century chemists, conceived the theory, from analyzing plants, that all the benefit which crops derived from manures is due to the mineral elements which these manures contain. According to Liebig, a farmer might better burn his litter and manure provided he scattered the ashes on the land than to go to the labor of hauling the unburned material to the field. This theory had an influence on agricultural thinking and practices perhaps never since accomplished by the work of any other scientist. While the main features of Liebig's contentions were soon disproved by field tests, the value of mineral fertilizers was demonstrated, and the great commercial fertilizer industry of the world stands as a monument to the "Liebig theory."

BENEFITS FROM TOP-DRESSINGS OF COMPOST

It has been amply demonstrated that turf grasses on soils of ordinary productivity can be maintained indefinitely by the use of chemical fertilizers alone. But the continued use of commercial fertilizers without any organic manure produces a solid, hard condition of clay soils which is not desirable from the golfing point of view. There is no better way to loosen a hard, impervious soil than to incorporate a large amount of decaying vegetable matter with it. This effect is secured if the decaying organic matter is on top and only the leachings soak into the soil, as any one can see who digs into and observes the friable condition of the soil under a compost pile.

Another benefit which comes from top-dressings is the mulching effect which they give to the turf. Plant roots feed as near to the surface of the soil as the heat of the sun and the moisture in the soil will allow. The upper layer of soil is usually rich, especially in sod land, and the plant food there is continually becoming available. A thin mulch which keeps this upper layer moist adds to the feeding ground of the grass plants. A top-dressing of inert material like pure sand often has an immediately beneficial effect on the grass.

A covering of dark substances, like charcoal, muck, or black earth, absorbs more heat from the sun than light-colored materials and will actually raise the temperature on light-colored soils a few degrees. This is sufficient to produce a favorable effect on the growth of grass in early spring when the ground is cold.

Of course, the plant food which compost carries is a direct benefit to the grass. In well-rotted compost the plant food is in a readily available condition and the grass soon takes on a healthy dark green appearance after it is applied.

In the case of creeping bent and Bermuda greens, top-dressing buries the rooting stems or stolons and gives a much better putting surface than is obtained without it.

DANGERS FROM TOP-DRESSING

It is difficult to think of any serious trouble which may arise from the use of good top-dressing if ordinary care is exercised. Of course, any practice, no matter how good it is, can be overdone, and it is possible to cover the grass sufficiently to smother it out. Green leaves must have sunlight in order to manufacture the material that goes to make up the roots, stems and leaves of the plant. Very frequent or heavy applications may cut off too much light.

It has been suggested that there might be danger from a too liberal use of compost producing a coarse-textured turf. The experience of the writer indicates that fineness of turf comes from crowding of the plants in the sod. Some of our selections of creeping bent are very coarse in the nursery rows but produce turf of fine texture. Any thing that increases the number of plants and thus increases the crowding appears to make the grass finer instead of coarser. The most heavily fertilized plats in our fertilizer experiment have the finest texture of all. While we have now no data bearing directly on this point we feel that the undernourished greens greatly outnumber those that are too highly fed.

The most serious injury which the writer has ever observed from top-dressing has come from the use of materials that do not decay and mix with the soil but remain in layers. Take for instance much of the commercial "humus." It decays very slowly and does not penetrate the soil as will sharp sand, nor is it washed down into the soil as is clay on sandy soils. Fortunately a great deal of the humus which has been used on putting greens has been blown away or was washed off the green by rains. Occasionally we find turf in which a layer of humus or coarse, smooth sand has been buried a half inch or more below the surface by subsequent top-dressings. Any one can test the effect for himself where such a condition exists. That layer will be found to be the weak place in the sod.

Low-Priced Golf at Pittsfield, Mass.

FREEMAN M. MILLER

One of the newest members of the Green Section is the Pittsfield Golf Club, Pontoosuc Lake, Pittsfield, Mass. The story of the organization and plans of the club furnishes a striking example of what a little money and large faith and cooperation can do for wholesome outdoor sport.

In the spring of 1920 the Pittsfield Boat Club acquired an 85-acre farm largely to control a 15-acre pine grove and pavilion on Pontoosuc Lake. Having no particular use for the remaining 70 acres and aware of the fact that they were remarkably well adapted for a natural golf course, 80 members of the boat club entered into an agreement to form a low-priced golf club, and the officers of the boat club were authorized to make a low rental of the tract to any organization which might be formed to carry out the project. The boat club further manifested its interest by