

# Topdressing and Its Use on Bent Grass Greens

(Continued from April Golfdom)

By O. J. NOER

A good deep soil of uniform texture and structure simplifies the problem of maintaining any golf green. It is one of the secrets of good management, and is the reason why the task of preparing topdressing is an exacting one. Alternate layers of different soil, or of pure sand, peat, or heavy soil complicate maintenance during the hot part of the year. Excessive humus also aggravates snow mold in the winter time.

After assembling the ingredients which consist of a good soil, a suitable sand, and a desirable type of organic matter, the problem of making a satisfactory topdressing is one of choosing the ratio of each ingredient which will make a satisfactory mixture from the physical standpoint. This is not an easy task. A simple test which will evaluate the physical and colloidal properties of the soil and tell how much sand and organic matter to use with it is needed. A mechanical soil analysis determines the amount of sand, silt, and clay in a soil. It will show the kind and quantity of each sand separate, such as fine gravel, coarse, medium, fine, and very fine sand, but will not throw any light on the colloidal properties of the clay fraction. Some kinds of clay are more plastic than others, and have a greater cementing effect. A mechanical analysis will not be useful until a simple method is devised which will distinguish between the plastic and non-plastic clay, and evaluate their cementing properties.

There are two ways to test the topdressing mixture to determine in a practical way the best ratio of soil, sand, and humus. When a little damp topdressing is pressed firmly in the palm of the hand it should have a springy, resilient feel, and should fall apart when touched lightly after the pressure is released. Formation of a tight, compact ball is evidence of too much clay. Failure to retain its form indicates that there is too much sand and not enough soil. The other test may seem like a crude way, but it is the best method to use until the soil scientist devises a better one. Small amounts of sample topdressing mixtures are placed in small containers. Each one is puddled with an excess of water and allowed to air dry thoroughly. The dry mixture should crumble easily. Failure to do so is evidence of too much clay; otherwise there is not enough sand, or that it is too fine.

## Making Test Mixtures

When making test mixtures, a ratio of equal parts by volume of soil, sand, and humus is a good one to start with. Other possibilities are one part soil, 2 parts sand, and one part humus; or 2 parts soil, 3 parts sand, and one part humus, etc. Where screened mushroom soil is used, two parts soil, 2 parts sand, one part screened mushroom soil, and one part cultivated peat generally makes a good topdressing, provided the soil is a loam and the sand is coarse. When a desirable combination is found, it should be used consistently and not changed. Should it become necessary to procure any one of the ingredients from a different source, it should resemble the former one. Before the new topdressing is made in quantity, trial mixtures should be prepared and tested by the mud puddle method to see that the new topdressing is similar to the old one.

Mixing of the topdressing is a simple matter when the soil is weedfree, and the humus is a screened or cultivated peat. Most clubs use a Royer compost mixer, a Wichita grinder, or a Kemp soil shredder. A few put the peat through a hammermill before it is used, especially if it is moss peat. The ingredients are placed in conveniently located piles near the machine. Workmen are stationed at each pile so each ingredient can be shovelled into the machine in the proper ratio. Screening is not necessary when there is little or no coarse material in the sand or humus. Anything that does not mat into the turf is taken off the green with a dandelion rake, or a similar tool. Some greenkeepers attach a piece of burlap behind the flexible steel mat to collect the trash raised by the mat as it is dragged across the green.

Those who like to use manure in the topdressing should compost it with soil first. Best procedure is to build the pile with alternate layers of manure and soil. The bottom layer, the third, the fifth, etc. is manure 8 to 12 inches thick; the second, fourth, etc. is soil 2 to 4 inches thick. The pile should be turned several times during the course of a year or two to speed decomposition of the strawy portion of the manure; and kill weed and clover seeds. Manure compost should be shredded by putting it through a Royer, a Wichita, or a Kemp machine and screened to remove coarse trash before it is incorporated into topdressing. (Continued on page 104)

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## Topdressing Bent Greens

(Continued from page 44)

### Sterilizing Topdressing

At one time some clubs used steam to sterilize topdressing and kill the weed seeds in it. Others employed dry heat. Steam chests containing lines of perforated iron pipes were constructed, and an old boiler was used to generate the steam. The soil was steamed until small potatoes imbedded in it were thoroughly cooked. Those who used the dry heat method would spread a thin layer of soil on a large sheet of quarter-inch steel plate. A fire was built underneath. The soil was scraped off after it became thoroughly warm. If heated too hot, or too long, destruction of organic matter may occur. Very few continue to use either method because they are costly.

Most weed seeds will be killed in the soil bed during cultivation, or from the shading effect of the cover crop. There is an easier and better way to kill any remaining stray viable seeds than by steam or dry heat sterilization.

The addition, during mixing, of a 100 lb. bag of vegetable meal (cottonseed, soy bean, etc.) or of Milorganite per yard of finished topdressing will eliminate weeds.

These organic materials generate heat within the damp pile and tend to dry the mixture besides killing weeds. Temperatures may reach 135 to 150 degrees Fahrenheit, but will gradually subside to normal during storage in the soil shed. Hot topdressing should not be spread on greens during warm weather because it is apt to scorch the grass. The pile should be reworked first to reduce its temperature, but the best plan is to make the topdressing 3 or 4 weeks beforehand so that heat will dissipate naturally.

Dr. DeFrance of the Rhode Island Experiment Station at Kingston, R.I., devised a method of sterilizing topdressing with cyanamid. The method is similar to the one for vegetable meals. The rate for cyanamid is 13 to 14 pounds per yard of topdressing. Specific instruction can be obtained by writing to the Rhode Island Station for a copy of the publication describing the method.

When either method is used, the amount

of nitrogen furnished by the vegetable meal, or by the cyanamid, should be deducted from the amount customarily applied in fertilizer.

Chloropicrin, or tear gas, is another material which can be used to sterilize topdressing. It is a volatile liquid and is injected into the pile, which is covered with wet burlap or canvas to keep the fumes in contact with the soil long enough to kill the seeds. Details as to method and amount to use can be obtained from the producers of chloropicrin, or the local distributor of the product.

Fertilizers such as superphosphate, muriate of potash, 0-12-12, etc., and even nitrogenous materials can be mixed and applied with topdressing. This method eliminates the danger of scorching the grass and is an excellent way to provide phosphate and potash. As stated elsewhere, it is not so desirable to have topdressing rich in nitrogen. There are times when greens need to be topdressed, but the grass has plenty of nitrogen already. Then a topdressing rich in nitrogen will provide too much and will make the grass too soft.

### Test Topdressing Reaction

The finished topdressing mixture should be tested for reaction. When it is moderate to strongly acid, enough lime should be mixed with the topdressing to make the mixture very slightly acid, or greens should receive enough lime in late fall or early spring to counteract the acidifying effect of the topdressing used during that or the preceding season.

Every golf club should have a soil storage shed large enough to hold a season's supply of mixed topdressing with enough room for extra soil and humus. A good roof is essential, but the sides and ends can be open or closed part way up from the ground. Enough topdressing can be made when convenient in the fall for the entire season following, and stored where it will be dry and in good condition for spreading whenever it is needed. It is impossible to do a good job of spreading wet topdressing by hand or by machine.

The Root spreader is the only machine now on the market which will spread topdressing efficiently. Success with it depends upon having the topdressing reasonably dry. Hand spreading with shovels is a common method. The topdressing is

dumped in piles alongside the green, and is spread from shovels with a long, sweeping, quick swing. Experienced workmen can do a green quickly, and will spread the topdressing uniformly over the surface.

### Working In Topdressing

Topdressing is worked into the turf with the back of rakes or by dragging a flexible steel mat over the surface. When the green is rough from innumerable slight saucer-like depressions, the rope handle for dragging the mat should be attached to the extreme ends of the long side, so the mat does not flex and follow the contours. Then it will drag topdressing off the high spots, and deposit it in the depressions. More frequent topdressing is justified on such greens to develop a true surface. The rate should be slightly heavier also. For use on greens with true surfaces, the rope dragline should be attached to the short end of the flexible steel mat so it will follow contours when dragged across the green to mat the topdressing into the turf. After the topdressing disappears, any pebbles or coarse debris left on the surface is removed with a dandelion rake.

From 1 to 1½ yards per 5000 sq. ft. of topdressing can be used on creeping and colonial bent greens in early spring and late fall. Not more than ½ to ¾ yd. should be used at other times. More than that may smother the grass and retard its growth. Greens of velvet bent, or those with a high percentage of it should never receive more than ½ to ¾ yard to 5000 square feet at any one time. It is impossible to work more than that into the turf. Larger rates smother the velvet and retard its growth.

Greens with heavily matted turf should not get topdressing until after the surplus mat of grass has been removed. Heavy topdressing buries matted grass, but does not eliminate it. The buried grass makes the surface spongy and undergoes rapid decomposition during hot, wet weather. Whenever the green is too wet, the products of decomposition are injurious to grass and are a contributing cause of the injury usually called "scald" for want of a better name. When the grass is not too badly matted, the surplus can be taken off at one time by cross-raking and close cutting one or more times as need be.

This operation is best done in early spring, about the time growth starts. It should not be attempted in hot weather. The green should be fertilized and topdressed immediately after the mat is removed. An entire season may be required to remove the surplus grass on greens with an excessive amount of mat. Instead of using rakes, the better way is to brush or comb the turf once a week throughout the season. Brushing can be more severe in cool than in hot weather. No topdressing

should be used until the turf is tight so the topdressing will make contact with the soil.

Greens received very little topdressing during the war because of the manpower shortage. Even before that time, the tendency was to topdress less frequently. This was the case even on the vegetatively planted strains such as Washington, which was supposed to need topdressing every 3 or 4 weeks to keep the turf tight. Many greens have not been topdressed for 3 to 4 years, and some for a much longer time. Putting surfaces are still good where daily close cutting is practiced and where brushes are used to prevent mat formation. Discarding front rollers is a distinct help in that regard, and should be done wherever possible. In other cases the comb should be used on Toro mowers, and the steel brush on other makes. With a good tight turf, one topdressing in the spring and another in fall should be sufficient.

Soil structure in the greens on some courses is bad, and sand, peat or clay layers cause trouble on other greens. More frequent topdressing at the maximum rate which the turf can withstand is justifiable in these cases until a good soil structure is developed. Deep forking or drilling in the spring and fall before applying topdressing is desirable also.

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