SELECTION OF TOPDRESSING MATERIALS

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In order to have a successful topdressing program, it is essential to choose the right topdressing material for the job. Soils can vary from very fine, heavy textured clayey soils to very coarse, light textured sandy soils, depending on the location. Therefore, the same topdressing material may have different results on different locations.

It is important to know the texture of the soil in your root zone. A physical analysis of your soil will give you this information. Most soil testing laboratories provide this service.

In addition to the proportions of sand, silt and clay in a soil, the coarseness or fineness of the sand portion, has an effect on the physical properties of a specific classification of soil. Medium size sand with a relatively consistent particle size usually has a higher rate of hydraulic conductivity than a material containing a more diverse blend of coarse, medium and fine particles. A principle to remember; water will move from a coarser textured soil to a finer textured soil more readily than the other way around, providing there is adequate pore space between the particles.

When using any material to modify an existing root zone, adequate cultivation is necessary to insure proper incorporation of the material. The more a topdressing material varies from the existing root zone in relation to its texture classification and physical properties, the more cultivation is typically needed. Without adequate cultivation there remains a very real potential for layering in the soil. Anytime there is a layer created in the soil, the interface between the layers will have the potential to negatively affect hydraulic conductivity, root penetration and even air and gas exchange characteristics of the soil.

Before you can determine the proper topdressing material to use, it is important to determine why you are topdressing. A few reasons for topdressing are: 1) Modification of existing root zone (Increase water conductivity; Increase organic matter content; Increase tilth; Increase Cation Exchange Capacity [CEC]); 2) Increase success rate of renovation thru improved soil seed contact; 3) Smooth a rough uneven surface

Two common materials used to modify a root zone are organic materials (in the form of compost) and sand. Caution must be practiced with either material.

Sand is sometimes used to improve the drainage characteristics of a heavy textured clayey soil. A heavy textured soil should reach approximately 85% sand by weight to have a positive effect on hydraulic conductivity. Medium to coarse size sand should be used for this purpose. A steady supply of a uniform material, which conforms to very specific guidelines, should be consistently available. Variations in material uniformity can void the success of the most well planned program. An agronomist can best prescribe these specifications.

Leaf compost is being used more and more to topdress athletic fields. Production by private and public recycling plants alike has made it a widely available material. It is sometimes blended with sand and sold as organic topsoil. The benefit to incorporating compost into the root zone is realized through the addition of organic matter. The addition of organic matter can provide a number of benefits. In a light sandy soil, organic matter can be of benefit by increasing the ability of the soil to retain moisture. This increase can combat compaction and maximize irrigation efficiency. The incorporation of organic matter into a soil adds essential plant nutrients. Depending on the source of the organic matter, this "fertilizer effect" can be substantial and could replace one or more applications in a fertilization program. Organic matter can also increase CEC or the ability of a soil to retain nutrients. This increase in not usually necessary with heavy textured clay soils but may be of benefit in sandy soils. Note that it takes a tremendous amount of organic matter to increase soil CEC. Thus, in most situations the benefit of incorporating organic matter is more a result of increase water retention and nutrient addition, than increase in CEC.

The addition of organic matter can decrease the compactive tendencies of a soil and over time help to improve the soil structure (tilth) of a heavy textured soil. Tilth can be associated with the soft, fluffy texture of a well-maintained garden soil. A lack of tilth can be associated with the hard clumpy soil of a goalmouth. The benefits of organic matter can be realized in all areas of an athletic field but more noticeably in high traffic areas where existing soil structure has been destroyed.

Once soil structure is destroyed the ability of the soil to drain and maintain turf cover is severely compromised. The result is a weed-infested area of high compaction. A major cause of this destruction is playing games in wet water logged conditions where the soil is actually smeared under the stress of heavy foot traffic.

Similar materials to leaf compost are biosolids such as sewage sludge and spent mushroom compost. These materials are much the same as leaf compost in that they have high organic content but many have the added benefit of higher nutrient availability and therefore the potential for a greater "fertilizer effect".

As with any topdressing material, care must be taken when acquiring and applying compost. A quality compost material should be adequately aged prior to purchase and be properly screened to eliminate all twigs and debris. It should show no resemblance to its original components and have a clean earthy odor.

The results of a compost analysis report should be requested prior to purchase. These results should supply a minimum of pH, % organic matter, soluble salt levels, heavy metal levels and the Carbon:Nitrogen (C:N) ratio. Included with these test results, should also be a reference made to the acceptable levels of soluble salts and heavy metals. If the compost is a blended material it should also carry a physical (sand, silt, clay) analysis and have a texture classification such as loamy sand, sandy loam etc. A chemical analysis is also useful in determining the potential "fertilizer effect" of a topdressing material.

The C:N ratio is used as a barometer to measure the level of decomposition and should be less than 30:1. Higher C:N ratios can cause nitrogen supplies in the soil to become temporarily unavailable to the turf until the C:N ratio is reduced through further decomposition. This can have a negative effect on turf quality.

With compost materials as with any other topdressing material, care must be taken to provide adequate cultivation in conjunction with the topdressing procedure. The more a topdressing material differs from the existing root zone, the more cultivation is necessary to blend the two materials. This is done to minimize the effects of layering. Applying highly organic compost to a mineral based soil brings with it the risk of layering. If adequate cultivation is not provided, this risk can become greater with each subsequent application. In this particular situation more is not necessarily better. An anaerobic organic layer (black layer) in the soil is a potentially devastating problem on athletic fields

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Cultivation in conjunction with topdressing should be accomplished during times of the year when there is adequate moisture available and when the turf is actively growing and is in a position to repair itself. Topdressing materials with high organic matter content such as straight compost materials should not be applied when there are inadequate moisture levels or when there is the potential for drought stress. These materials have the ability to rob the turf of available moisture when moisture is in limited supply.

Core aerification is generally the recommended means of cultivation with any topdressing application. Multiple passes done in different directions are typically recommended. Again, the intensity of the aerification procedure is governed by factors such the extent of texture variation between the topdressing material and the root zone and the degree of thatch buildup in the area to be topdressed. When root zone modification or turf renovation is the intent of a topdressing application, multiple passes to provide a coring pattern of a maximum distance between core holes of 2" and at a depth of 2" to 3" is recommended. The application of topdressing should be accomplished prior to core aerification. The cores, along with the topdressing should be dragged into the core holes using a drag mat at the completion of the procedure. If a more rapid change in the surface conditions is desired, the soil cores can be removed after aerification; in this case it would be appropriate to topdress after soil cores are removed.

Where severe soil structure damage has occurred such as in goalmouths, it is sometimes necessary to till the area in an effort to blend the topdressing material with the damaged soil and create an adequate seedbed.

Be wary of over-cultivating with the rototiller style of equipment, especially if the soil is to dry. Rototiller style cultivators can destroy existing soil structure by pulverizing the soil into a fine grainy (dusty) material if over used. As with most soil cultivation procedures, the soil should be moist enough to hold its shape after being clenched in your fist but dry enough to crumble if rubbed between your thumb and forefinger.

It is not uncommon among sports field managers and contractors alike to incorporate topdressing into a renovation project. Topdressing can not only smooth and therefore improve the topography of a field, but also improve soil seed contact, which is critical to the success of an athletic field renovation.

When topdressing is used properly, it can provide beneficial results, which in certain situations could not otherwise be achieved as effectively. The cost of these benefits must be justified when compared to all other available options.

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