UNDERSTANDING TURF MANAGEMENT
The fourteenth in a series
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TOPDRESSING

It has been suggested that the concept of topdressing originated when someone recognized that creeping bentgrass growing on coastal sand dune areas spread faster and provided a more dense stand where the stolons were covered by drifting sand. This observation was applied to the maintenance of golf and bowling greens where it had the added benefit of levelling the surface and providing a smoother ball roll.

Since that discovery several reasons have emerged for topdressing. They are: thatch control, soil modification, smoothing and levelling, covering of bentgrass stolons, covering of seed during overseeding, recycling organic wastes through composting and winter protection. Two of these reasons, thatch control and soil modification will be covered in some detail.

Although thatch does not present a problem in most sports field management programs, lightly used areas on a field, such as corners may have a significant build up of thatch. Thatch can also become a problem on the grounds surrounding a sports field. Thatch is defined as the accumulation of living and dead leaves, roots and stems and other organic debris between the soil surface and the base of the green vegetation.

Why worry about thatch on a sports field? It should only make the surface more resilient. Thatch influences the quality of the turf, however, by creating localized dry spots, causes scalping during mowing, and increases the potential for disease, insect and winter injury.

Studies by Prof. Eggens of the GTI have demonstrated that topdressing is one of the most efficient procedures available for thatch control (Table 1). In this experiment topdressing was done monthly with the soil indigenous to the site at a rate of 0.1 m^3/100 m^2. The data was recorded after 10 topdressing operations over two years. Although cultivation reduced the depth of thatch, Eggens found topdressing alone was more efficient for the control of thatch than any of the cultivation procedures which are more costly and time consuming.

Substitution of topdressing for turf-damaging verticutting or coreing has the additional advantage of not opening up the turf sward to allow the germination of weeds. Eggens studies tended to show that annual bluegrass was not as prevalent in topdress-only plots as in plots where some form of cultivation was used.

Topdressing is often recommended for the modification of the root zone as well as levelling and smoothing the surface. The latter is accomplished by matting the surface after the topdressing operation.

A cardinal rule in topdressing is to topdress with the same material as was used in the construction of the existing root zone. If this rule is not followed it is impossible to predict what water transmission and retention values may develop with time as diverse layers of sand:soil mixes build up. Coring to relieve compaction, followed by topdressing with a non compatible mix may, over a period of time, result in a clay:silt:sand ratio which will compact to a greater degree than the original material.

A noted Canadian golf superintendent once remark "You can tell the number and duration-of-tenure of superintendents at any golf course by the number and depth of the sand layers in the surface of the green." The same may be said for some sports fields. Each resulting layer will have different water characteristics.

If the original rooting zone was a clay, a saturated zone may occur in the topdressing layer following a heavy rain or irrigation. Similarly a saturated zone may eventually develop due to a perched water table if the original root zone was constructed from a sand having a significantly different size distribution than the topdressing sand. The worse scenario is to topdress a sand rooting zone with a silty clay soil which will eventually plug the pores in the sand and ruin the advantages of a sand rooting zone.

Because of the time required to modify a rooting zone, the danger of incompatibility of particle size of the original material with the topdressing material and the restriction of the new root zone to the depth of coring, it is not recommended that topdressing be used as a procedure for field renovation. It is better to 'bite the bullet' and carry out a complete field renovation at which time corrections of any drainage problems can also be achieved.

The rate and frequency of topdressing is generally dictated by the amount of thatch accumulation. The rate may vary between 1/8 and 1/4 inch per application. Table 2 converts the depth of application to vol-

Table 1: The influence of topdressing and cultivation on the control of thatch in bentgrass maintained as a putting surface.

		Without Topdressing	With Topdressing
		mm	
Control	11.5		
Topdressing Only	4.2		
Vertical Mowing		9.4	4.0
Core Cultivation		8.1	4.9

Table 2: The volume of material required to topdress 1000 ft.^{2} area to various depths.

Depth of Topdressing	Volume ofSoil
(inches)	(cubic yards)
1/8	0.40
1/4	0.77
3/8	1.14
1/2	1.54
5/8	1.91
3/4	2.31

ume of material required per 1000 ft^2. Light topdressing at a rate of 1/8 inch every two weeks may be necessary if a new bowling green is being levelled. Most sports fields, however, may only require a topdressing at 1/4 inch twice each season to control thatch. The operation should be coordinated with periods of rapid tiller development and with the time of overseeding.

Topdressing may be used as a means of disposal of composted organic wastes from other parts of a grounds maintenance program (see Bladon, Sports Turf Newsletter Vol. 6, No. 1, pp 4). Bladon has found his program of topdressing with a soil:compost mix has reduced his thatch problems to near zero. He no longer uses any form of verticutting or coring for thatch. High capacity topdressing equipment has made the procedure rapid and economical. Furthermore his tipping costs at the local landfill site have been greatly reduced.

A factor which should be considered in the selection of topdressing materials is freedom from weeds. Obvious contaminants such as quack grass rhizomes should be ample reason to reject a supplier. Freedom from other weeds may be checked by a simple germination test. Freedom from herbicides used on the field where the topsoil was obtained should also be considered.

A final consideration should be freedom of the material from stones and other debris, such as broken glass, which might cause injury to the athlete.

Environmental Persistence of 2,4,-D and Other Pesticides used in Turfgrass

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Pesticide use can be an important component in well designed programs to maintain turfgrass in high use areas. However, it is important to examine the persistence of any pesticides used if we are to understand and to minimize the chance for human exposure to these pesticides, particularly in public areas such as parks, school yards or sports turf situations.

Despite all the facts to the contrary, the general public continues to be fearful of 2.4-D. The logical and correct reaction is that most people prefer to avoid exposure to 2,4-D, or to any pesticide. Some municipal and school jurisdictions have banned the use of 2,4-D in public areas. The Ontario government has developed regulations that some areas must be posted with signs when treated with pesticides so that people can choose to avoid the area and minimize any chance for exposure. These concerns and questions led to a series of studies at the Univ. of Guelph on the environmental persistence of 2,4-D and other pesticides used on turfgrass.

The following is a summary of the main results of these studies.

When turfgrass is treated with pesticides for weed or insect control, only very low percentages (1 - 6%) can be physically dislodged by vigorous scuffling with cloth-covered boots immediately after treatment. Dislodgeable residues decline rapidly to well below 1% of applied material within one day for the insecticides diazinon, chloropyrifos or isofenphos and within four to five days for 2,4-D or related herbicides.

Mowing the turfgrass does not markedly influence the disappearance of dislodgeable residues.

At equivalent rates of active ingredient, granular herbicides or insecticides are less dislodgeable than liquid formulations of the same chemicals applied as sprays. However, at the high rates usually recommended for 2,4-D applied as a fertilizer formulation, the dislodgeable residues were not lower.

Irrigation or rainfall immediately after application reduced dislodgeable pesticide residues to negligible levels (less than 0.01%) even on the day of application. A light irrigation may even enhance the effectiveness of insecticides, particularly when they are applied as granular formulations.

[Editor's Note: A summary of an address presented by Prof. Stephenson at the First Annual Ontario Turfgrass Symposium, Guelph, Jan. 7 -9, 1992]