

STRICTLY GOLF

Don't gamble on sand selection

Insist on sand that has been subjected to particle size analysis, says this author.

by Stephen McWilliams

■ When superintendents select general construction-type sand for greens construction or maintenance, they increase the potential for chronic turf problems.

Selecting sand for sand-based systems must be based on a proper chemically- and mechanically-dispersed particle size analysis. This process strips silt and clay from the individual sand grains to show a true particle size distribution. By not separating the silt and clay from the sand fractions, a basic drop sieve analysis (common in the construction industry) can misrepresent multiple sand grains as one particle.

Because the goal of a sand-based system is balanced air and water management, the level of fine and very fine fractions is critical in the initial grow-in and long-term operation of USGA-perched water table systems.

A basic turf management rule: don't topdress sand-based systems with sand that is finer than the base rootzone mix. Doing so can lead to restricted air movement due to layering, and as a consequence, root pruning, a loss of surface stability, and rapidly deteriorating turf quality.

When buying sands for a sand-based system, make sure the particle size distribution—the primary basis for your decision to purchase the materials—is determined by a chemically and mechanically dispersed particle size analysis. It is also prudent to sample and test the delivered sand. Mistakes do happen.

—The author is president and CEO of Turf Diagnostics & Design, Inc., Olathe, Kansas.

Comparison of full mechanical particle size analysis and dry sieve analysis						
Case 1				Case 2		
Dry sieve	%Δ	Full mechanical		Dry sieve	%Δ	Full mechanical
1.6	-0.9	0.7	Total gravel %	0.0	0.0	0.0
12.7	-3.9	8.8	Very coarse %	7.5	-5.7	1.8
31.0	-6.4	24.6	Coarse %	44.9	-17	27.9
30.8	-1.5	29.3	Medium %	31.4	+9.8	41.2
15.9	+7.5	23.4	Fine %	17.9	+6.6	24.5
2.9	+2.8	5.7	Very fine %	0.1	+0.3	0.4

Textural analysis				
Case 1			Case 2	
Dry Sieve	Full mechanical		Full mechanical	Dry sieve
N/A	91.8	Sand %	98.4	N/A
N/A	0.3	Silt %	0.4	N/A
N/A	7.3	Clay %	2.1	N/A

The importance of full mechanical analysis

■ For any important turf application, these tables show that the quality of the sand has been misrepresented by an unacceptable testing method.

Case 1 and Case 2 show a considerable shift (%Δ) in sand distribution from the "Total Gravel," "Very Coarse" and "Coarse" fractions to the "Medium," "Fine" and "Very Fine" fractions. This indicates a potential risk of relying on a dry sieve analysis when buying sand for use in high-performance sand-based systems.

To meet 1993 USGA standards, all sand testing must be a full mechanical particle size analysis. All sand distribution testing for turf applications should be tested in this manner.

In a full mechanical analysis, if there is any silt and clay, the particle size distribution for the sand cannot total 100 percent as sometimes seen in the dry sieve method. If a sand particle size analysis is presented and the distribution totals 100 percent, further investigation is called for.

—S.M.

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