



Q&A

Big book smooths bumpy ground

BY DR. DAVE MINNER, PH.D., ASSOCIATE PROFESSOR, IOWA STATE UNIVERSITY

Have Questions?

SEND THEM TO DAVE AT: ISU, HORTICULTURE DEPT., AMES, IA 50011

Dear Dr. Minner,

I'm a landscape architect working with a firm in Rapid City, S.D. I came across your name through the Q&A articles in the Sports Turf Topics 1998-1999 compendium of STMA articles. We are increasingly involved in the design of sports facilities and I'm really having a hard time finding good sources with actual construction specifications for and the subsequent maintenance of sports fields. Most of what I read is much too general to be of any use. Soccer, baseball, softball, and football fields are on the priority list as of now. Could you provide some advice as to reference materials, persons, societies, etc.?

Nancy Hovdenes
Landscape Architect
Rapid City, South Dakota

The latest and most comprehensive written resource is *Sports Fields: A manual for Design, Construction and Maintenance* by Puhalla, Krans and Goatley, 1999, 464 pages, ISBN #1-57504-070-0. Contact Ann Arbor Press, Chelsea, Mich., 800-487-2323. Prior to this publication there was no comprehensive book on building and managing athletic fields. I teach my Athletic Field Design and Construction course at ISU from this book and it also is my first reference when stumped by a phone call. The entire book is easy to read and takes a practical approach to designing, building and managing fields. The authors also deal specifically with each sport and offer suggested drawings and layouts of irrigation and drainage.

Other resources on my shelf include: *Natural Turf for Sport and*

Amenity: Science and Practice, 1994, 404 pages, by Adams and Gibbs, ISBN 0 85198 720 6, Oxford University Press, 845 North Park Ave, Tucson, Ariz., 85719. The authors are from the United Kingdom and the sports are European; however, this book gives an excellent account of drainage principles and design. It talks about sand by pass systems that are becoming more popular in the United States because of their good performance at a reduced cost.

Two small and inexpensive publications are: *Athletic Field Construction and Maintenance* by Taylor, Blake, and White, Ag-BU-135, 1987. This 16-page guide was developed by the University of Minnesota Extension Service, Minneapolis, Minn. It has a simple formula for mixing sand, soil and peat for fields. Cornell University has a 13-page guide titled *Athletic Field Maintenance—a Guide for Sports Turf Managers*, by Hummel and Petrovic.

Floyd Perry has a series of very practical guides that are loaded with pictures and comments on athletic field management. The series of *Floyd Perry Pictorial Guides* is published by Grounds maintenance Services, 5234 Cypress Creek Drive, Orlando, Fla., 32811, or call 800-227-9381.

Now for a specific question from Nancy: "We renovated a city park soccer complex with native soil fields and no subsurface drainage. Excessive moisture was not a problem because of a semi-arid climate. The root zone featured 6 inches of topsoil mixed with 2 inches of compost. Goal areas were

reinforced with Netlon mesh elements. The fields were fall seeded with 75 percent Kentucky blue and 25 percent perennial rye; final grading looked great, very smooth and level, but now the field seems lumpy with high and low spots. Starting over with regrading is not an option right now, so how do we smooth out the field? How much corrective leveling can be expected from some kind of coring and topdressing program? Should we aeriate, topdress, roll, fertilize, irrigate or limit play, or should we use the same topdressing as the field is made of or use straight sand? How much topdressing and how often?"

Wow! Take a breath, Nancy! These are all good questions and the best place to start is with a strategy. You will not change the grade on the field by topdressing or any other type of management, so do not expect to make water run off of the field. However, you can turn remarkably bumpy fields into a smooth surface by aggressively coring topdressing and dragging. I've been able to smooth out 2-inch bumps and depressions caused by settling, trenches, clumpy grass, low irrigation heads and rutting traffic. The field will get smoother with each successive topdressing, but I like to let the client know that this is a slow process that should be evaluated after three years of adding about 0.5 inches of topdressing each year. Core topdress and drag as often as possible to reach these targets. Coring and topdressing two to four times per year with 1/8 to 1/4 inch of topdressing is not uncommon. As much as 1/2 inch of top-

continued on page 38

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Q&A

continued from page 42

dressing sand can be applied before deep coring with a vertidrain.

On native soils I typically use straight sand since it is effective, easy and inexpensive. Aggressive coring will help mix the sand with the native soil. The most effective modification (greatest change in physical properties with the least amount of added sand) has been obtained from sands in the very coarse to coarse size range. Select a uniform coarse sand (80 percent of the particles between 1.0 and 0.5 mm and 95 percent between 2.0 and 0.5 mm) to maximize large pore space when modifying native soil fields high in silt and clay. Other beneficial materials such as city compost or inorganic amendments (Turface, Axis, Zeopro, etc.) can simply be topdressed and incorporated into the profile with coring and dragging.

The best time to smooth out the bumps and depressions in the field is at the end of a playing season when the grass is worn and some of the soil may be exposed. Slow dragging with a leveling bar or drag will cut the topdressing off of the high areas and deposit it in the low areas. Combine this with seeding and the repeated process over a three-year period will result in a much smoother field.

Advertiser's Index

Company	Page	Circle
Bannerman Ltd.	2	101
Bishop Enterprises	20	110
Covermaster Inc.	17	107
Cygnat Turf & Equipment	19	109
Delta BlueGrass Co.	11	106
Diamond Pro	42	123
Earth & Turf	10	105
First Products Inc.	37	121
Goossen.	34	118
Laser Leveling Inc.	20	113
M.S.T. Consultants Inc.	21	111
National Mower Co.	36	120
New York Turfgrass Association	24	115
Ohio Turfgrass Foundation	12	107
Partac Peat Corp./Beam Clay	38	122
Pennington Seed Inc.	43	124
Thomas Bros. Grass	22	112
Tiftway Sports Inc.	24	114
Toro Co.	5	103
Triangle Marketing Sales Group Inc.	26	117
Turfco Mfg. Inc.	23, 25	113, 116
United Horticulture Supply	3	102
West Coast Turf	9	104
World Class Athletic Surfaces Inc.	35	119

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