

## EXPERIENCES IN ATHLETIC FIELD CONSTRUCTION WITH SANDS

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During the last 20 years there has been increasing interest in athletic field quality and particularly in the use of sand mixtures.

Before relating experiences with sand field construction, it may be useful to examine the qualities of a good athletic field and relate these to the use of sand mixtures for fields. A good athletic field should:

1. offer a uniform, stable, non-slip footing over the complete field--rain or shine;
2. offer smooth, uniform surface so that footing is secure;
3. offer some cushion or resiliency in the case of a fall;
4. offer a dense uniform turf surface for footing, cushion and color;
5. look good to the spectators;
6. be able to be maintained;
7. offer an appropriate surface for the requirements of the game;
8. and most importantly, to be as safe as possible for players.

There are other characteristics that could be listed but these should do.

What will it take to achieve a safe playing surface?

1. It will take a smooth surface with uniform footing which will require a uniform soil throughout the whole field
2. A solid, stable non-slip footing, rain or shine, will take a soil that can remove excess water from the surface and interior rapidly enough so that it does not affect footing; or a soil that will be stabilized by water.
3. For a field that can be maintained, it will take a soil that maintains an adequate infiltration rate and adequate percolation rate while retaining enough moisture to support growth, that has nutrient holding capacity, and offers solid footing when wet and uniform surface characteristics.

The only soil type(s) that offer these characteristics are very sandy or sand mixtures.

For more information on the subject, see University of Minnesota bulletin: Athletic Field Construction and Maintenance, AG-BU-3105, Taylor, Blake and White, 1987.

My experiences with sands have led me, personally, to the following:

1. Medium sands are best.
2. At least 60% of the sand used should be in the 0.25 to 1.0 mm particle size range.
3. Particle sizes less than 0.1 mm should make up less than 3% of the sand.

4. Particle sizes greater than 2.0 mm should make up less than 3% of sand.
5. The fineness modulus of the sand should fall within the range of 1.75 and 2.5.
6. The best soils for sand mixtures should have a silt:clay ratio of less than 2:1.
7. Sands mix better when it is a little moist.
8. Soils mix better at slightly below field capacity.
9. That most local peats are generally not satisfactory because of silt content and highly decomposed organic matter.
10. Sphagnum peat (94% organic) that has been mined, processed, and shipped under good quality control is best.
11. Unless you can use peat of high quality, you are better off letting the grass produce the organic matter.
12. The best mixtures result from premixing with a front end loader before processing through a shredder which has a rotary screen as the last operation.
13. Mixing in place, say with a rototiller, never results in a very satisfactory or uniform mixture.
14. Sand mixtures should be made up of at least 90% sand by weight.
15. People who do not get professional advice prior to devising the mixing ratio and testing the end mixture usually cause more problems than they solve and spend more for a poor field than they would have for a very good field.
16. If you can't do it all-the-way, then don't try at all. You will probably be far better off to make the best of what you have and disturb the native soil as little as possible.
17. You must have an automatic irrigation system.
18. You must have a subsurface drain system.
19. I like sharp sands.
20. You should mix phosphorus and sulfur into the soil mix before seeding.
21. Use equal amounts of nitrogen and potassium on a regular basis.
22. Be sure to irrigate the field a few hours before a game or practice--it must be moist when in use.
23. Good luck.