

# Infield skin maintenance: Use your resources wisely

*Editor's note: During a panel discussion on infield dirt care at last month's STMA Conference, Gary Vanden Berg, CSFM, director of grounds for the Milwaukee Brewers, said a few years ago Atlanta Braves manager Bobby Cox reminded him, "80% of baseball is played on the dirt." Maintaining your infield skin is as important as any task you do because its effect on playing the game safely and fairly is enormous.*

## What is an infield mix?

All soils consist of sand, silt and clay. The infield mix is the combination of these components plus any conditioners or additives. To understand how your mix works you need to understand the components.

One hundred percent sand is loose, free flowing and drains well. On its own and dry, sand will produce an unstable and unpredictable surface. However, with the right amount of water it will be firm and playable but forgiving, allowing for sliding and clean ball hops. Consider a beach where the water meets land. This area would make a very playable surface.

Silt and clay have opposite issues compared to sand; Too much of these and you have poor drainage. Also, when clay and silt get too dry they become rock hard, often cracking, and create dangerous hops and possibly injury. These issues can be greatly compounded when clay and silt get compacted due to heavy traffic. If kept at the right moisture level, and properly groomed, clay and silt are very stable and wear resistant making them ideal for high impact areas.

All three components are necessary to attain a safe and playable field that is easy to maintain. WATER MANAGEMENT IS CRITICAL TO PROVIDING A SAFE AND PLAYABLE FIELD NO MATTER THE SOIL MIX. Knowing the makeup or composition of your infield mix will



Doug Gallant of the Cincinnati Reds, courtesy of Profile Products





help determine a baseline from which maintenance practices can be developed. A sand, silt, clay analysis can be performed on your field in two ways:

Submit a sample of your infield mix (1 pint baggie) to your local distributor, soil testing lab or your local Ag Extension service. Ask them to perform a sand, silt, clay or particle size analysis. There are reasonable costs associated with this option.

Or, fill a straight sided jar half full of your infield mix. Fill with water and shake vigorously until the soil is suspended in the water. Set aside and let it stand until the mix has fully settled. This will take from 1 hour to overnight. The sand will settle out first and will be at the bottom, the silt next and the clay last and at the top layer. Measure each layer and divide it by the depth of the total mix in the jar. This will give you the percentage of each component.

Proper soil sampling technique: Remove the top ½ inch of infield mix. Take several samples from around the infield at a depth of ½ inch and 3 inches. Mix these samples in a container to get a well-mixed sample. Use this mixed sample to do your jar test or send out for testing. If certain areas of your field stand out as significantly different, sample and test these areas individually.

#### How much do I need?

Most mixes consist of a minimum of about 60% sand to a maximum of 70% sand and the balance silt and clay. In locales where the particle size of the sand is fine, sometimes called “sugar sand,” a higher percentage of sand is utilized in the mix. With most infield mixes, the calcined clay recommendation is 1 ton (40 bags) of product per 1,000 square feet of skinned area incorporated with a Rototiller, into the top 4 inches of the infield mix. This equates to 10 tons for a high school, college or professional field with 90 foot base-lines and grass infield.

The variable in mixes besides sand particle size is the amount of clay. Some products combat the negative effects of

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clay by preventing compaction and maintaining appropriate moisture levels. Therefore, as the percentage of clay increases in a mix so does the amount of material required. For higher clay content mixes (60%+) we recommend 1.5 tons (60 bags) per 1,000 square feet incorporated into the top 4 inches of the infield mix or 15 tons for a high school, college or professional field with grass around the mound. If the infield is completely skinned, double the amount is recommended.

Incorporating 1 to 1½ tons per 1,000 square feet into the top 4 inches of the skinned area is identified as “full rate” or “complete renovation.”

Thanks to Profile Products for this information. Turface is their best known product. [www.profileproducts.com](http://www.profileproducts.com)

## The basics of infield care

To create an ideal infield skinned area, you must have a good knowledge of the following:

- Infield mixes vary from region to region. The published ASTM standards include an ideal range of what a good infield mix should be and place infield soils into certain criteria as closely as possible. Before building or renovating an infield area, you must conduct a textural analysis to determine the amount of Sand/Silt/Clay in both existing and potentially new materials, along with particle sizing, to make sure that they will bond together and create an ideal infield. You will determine if the infield mix is appropriate for your specific field. Dark red color has long been the standard for ball fields, but do not allow color only to be

## Silt necessary ingredient for infield skin

By Grant McKnight

The ideal ratios of sand, silt and clay in your mix can put you on the path to fewer rainouts, lower maintenance costs and a better playing field. There are many infield mix suppliers across the nation and most sell mixes containing a two-to-one ratio of sand to clay. Among the higher profile infield mixes, the inclusion of silt is found at levels below the clay content.

When Natural Sand Company entered the ball field market with DuraEdge infield mix, I was told a number of times that the ideal mix contains no silt. With my background in construction materials and mining, I found this concept to be very peculiar. All soil is composed of sand, silt and clay. Without silt, there is nothing to bind the larger sand particles to the smaller clay particles. A mix with 3-5 percent more clay than silt virtually eliminates “chunk-outs,” increases the amount of moisture the dirt can absorb and provides firm footing in what is normally unplayable conditions.

In light of the fact that many infield mixes contain little or no silt, we created FieldSaver to amend fields lacking the correct ratio of sand, clay and silt. Through this program, “chunking-out” is no longer an issue for our clients.

Natural Sand Company recently used this program with Mike Boekholder of the Philadelphia Phillies and Bill Deacon of the New York Mets to help them increase their fields’ playability. In both cases, the infields were “chunking-out” consistently during games no matter how much water was applied to the surface. We added FieldSaver in an effort to balance the silt and clay ratio in each infield. The results of correcting the infield mix composition were outstanding. Nowhere was this more apparent than in game five of the 2008 World Series in Philadelphia. After a run was scored and the game was subsequently halted, the conditioners on the surface were removed and Mike was surprised to see a relatively uncompromised clay surface.

Grant McKnight is the owner of Natural Sand Company, [www.naturalsand.com](http://www.naturalsand.com). ■



**Water management is critical to providing safe and playable skins no matter your soil mix**



the overriding reason for adding a particular type of infield mix.

- Sand Particle Size is an overlooked element in the success or failure in the infield skin material. A high percentage of coarse sand particles equals weaker stability, while a high percentage of fine sand particles equals hard and slow percolation rate.

- Soil Amendments vary in color, granulation sizes, absorption qualities and texture. What your current mix consists of, and what your final goal is, should help determine what soil amendment you choose. There are many products from soil conditioners like calcined or vitrified clays to percolation products (crushed aggregates), it really comes down to your personal preference and your needs for the infield.

- Nail drags/scarifiers are vital tools for your infield. They allow you to keep that ¼ to ½-inch of fluff on top, but yet also maintain a firm surface. Using a nail drag is recommended as often or more than a finishing drag to eliminate any divots, ball marks, cleat marks or the chicken scratch from the infield.

- Water Management is the most important part of a groundskeeper's job. As Trevor Vance for the Kansas City Royals says, "We are not groundskeepers, we are moisture managers." Groundskeepers deal every day with how much water to put in our clay, when to add water, when to not add water, is it going to rain,

is it hot and dry, etc. If you can control the amount of water on your field, it will make the job to a better infield easier. If a poll were taken of all groundskeepers, the number one thing that we check daily is the weather. Determining what the weather will be for the day determines how much water to add to your infield or not to add. Watering before the contest is good, but not ideal. Water needs to be added the day before to ensure that it is throughout the entire infield mix profile and will be consistent for the contest. Infields play the best after the removal of a tarp because that is when the moisture content is consistent and the weight of the water on top of the tarp has created a firm infield.

- Dragging Patterns can determine a good or bad infield. You want to avoid creating lips around the edges of your infield that can cause bad hops or unsafe conditions for the players. These can be eliminated by brushing your edges, using a stiff drag around the edges, washing the edges occasionally when needed or if necessary removing them by cutting them out with a sod cutter.

In dragging your infields, you need to follow some basic practices: vary patterns daily; smooth drag the opposite way you nailed dragged. If you naildrag in circles, smooth drag in a long pattern. Do not drag faster than you can walk. Stay at least 1 foot away from edges.

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Minute Maid Park, Houston, courtesy of Dan Bergstrom

- Leveling Fields is important. This should be done after adding infield mix to your field or as a process of yearly maintenance. This will keep your fields level and remove any birdbaths that have been created over time.

- Using a ½ Ton to 4 Ton Roller is possibly the best kept secret in maintaining a really good infield skin. Periodic rolling will pack the infield soil making the infield mix firm and consistent.

Thanks to Bill Marbet and Glenn Lucas of Southern Athletic Fields for this information. MuleMix field conditioner is among many infield products they offer, [www.mulemix.com](http://www.mulemix.com).

## How much moisture can your dirt handle?

Tarp or no tarp? How much water should be applied to the skin? How long will it take for the field to reach consistent levels? The infield skin can provide unlimited frustration for turf managers. By identifying the composition of the infield mix, you can predict how the amount of surface moisture and the clay content of the playing surface will interact. When you know your infield mix ratio, you can answer the question, “How much moisture can your infield skin handle?”

Infield mixes can be made from native soils, designed mixes, or crushed aggregates, or a blend of them all. These materials all originate from nature and require a large proportion of very fine particles to provide enough cohesiveness to knit together to form a firm playing surface. Although necessary, these same fine particles can reduce drainage and act as binders when they dry out creating excessive hardness.

Turf managers wanting to achieve a consistent playing surface capable of taking in large amounts of water while remaining playable should do three things: test the composition of your current infield mix, add an amendment to balance your silt and clay content and then record your results in games played throughout season.

“A groundskeeper’s main mission is to manage water effective-

ly. Water is your best friend and your worst enemy,” says Clayton Hubbs of Stabilizer Solutions ([www.stabilizersolutions.com](http://www.stabilizersolutions.com)). “The right amount of water keeps your turf lush, maintains the perfect playing consistency of your skin, and keeps your mound firm, yet malleable. Too much water or too many rain delays and you might be out of a job.”

If Mother Nature is the culprit you can count on a postponed practice, game or even tournament, but is postponement necessary? Hubbs’ product, Stabilizer, is a 100% natural soil enhanced with polymer. That polymer essentially replaces water and can protect the soil from the elements by repelling water and never freezing, allowing northern managers to get practices started earlier in the year.

Hubbs says managing water can help balance your budget, not only by reducing irrigation costs but also time and labor costs. Grant Trenbeath, head groundskeeper for the Arizona Diamondbacks, calculated that his warning track featuring Hilltopper has saved him 500 man hours each year, says Hubbs. EP Minerals, makers of Play Ball! Conditioner ([www.epminerals.com](http://www.epminerals.com)) recommend applying your conditioner and nail drag an inch or two deep for fast playability, or work it 4 to 6 inches deep in new construction or renovation. Incorporating deeper treats 10 times more soil than surface treatments and provides an opportunity to address soil interfaces or layers that are causing poor drainage. When filling low areas, the company recommends mixing your conditioner into the infield mix before placing. If the filling is sizeable, consider regrading and refreshing the entire infield soil by applying the proper amount of conditioner by incorporation.

With regard to infield conditioners, the book “Sports Fields” by Jim Puhalla, Dr. Jeff Krans and Dr. Mike Goatley, says, “One real benefit of calcined diatomaceous earth products is that they allow the maintenance staff to rake (infield) soil out of the grass, which is just about impossible with other conditioners.” And “[infield



conditioners] also help control dust control during the summer, because they hold water in the soil longer. This is especially true of the diatomaceous earth products; in most of the country, it should be possible to wet the soil thoroughly in the morning and play on it all day without having to stop and re-water." The authors say diatomaceous earth conditioners can also be used in smaller volumes than calcined clay.

### Tips for limited budgets

With a little creativity, quality products, and volunteer support, a small budget can go a long way. Raechal Volkening, a consultant who spent 7 years with the Milwaukee Brewers before starting her own business, shares her experiences with budget-challenged organizations.

Before Raechal's tenure with the Brewers, one of her jobs was head groundskeeper for the Butte Copper Kings. During her season there, she was faced with very little funding for supplies or labor. In order to achieve success, she was forced to come up with some creative solutions. "Thankfully, the previous groundskeeper had some Pro's Choice on hand that the crew could work with. I was able to get by with the existing supplies. "Beyond that, I found

four staff members through the welfare department that were eager to learn and got the community involved for additional labor. I borrowed equipment from other local organizations wherever possible. But the biggest lesson I learned was not to think of myself as an island. There is a lot of support available when you reach out."

- Create a sense of pride and ownership by getting the community (athletes, parents, booster club members, etc.) involved.
- Have players work on their specific areas (pitchers on mound, infielders on lips, etc) for greater connection and sense of ownership.
- Take advantage of work-study programs.
- Share or borrow equipment, especially items you only need a few times a year.
- If your program has more than one field, pick one to showcase. Make it the example of what all your fields could be.
- The value in amendment products is cumulative. If you can only afford to use a limited amount of product now, build up over the season or subsequent seasons. ■

*This advice supplied by Oil Dri, makers of Pro's Choice products, [www.proschoice1.com](http://www.proschoice1.com).*

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