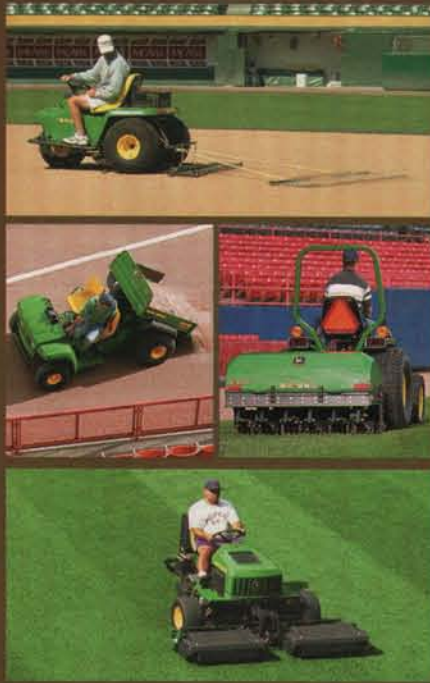




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The first ice storm hit at the end of Christmas break; more ice storms followed in January. Most areas of the field were covered with about 1 in. of ice.

He used a half-inch drill bit on a power drill to open up the areas that were too hard for standard aeration. The openings were filled with the same coarse, washed sand used in the topdressing program.

This process, combined with spot irrigation, brought these sections into good enough condition for working with the walk-behind aerators. These machines also are used for the wings and the infield while a tractor mounted unit is used for the combination slice and core of the outfield. A pull-behind unit is rented for slicing only of the outfield.

Newville says, "Our biggest surprise came on a Saturday morning in May. Heavy rains overnight brought us in early to work the skinned area. We discovered a drunk driver had crossed through two cyclone fences and put his truck on the third base wing, then managed to drive away. We were left with fences that needed repair, tire

tracks, a few oil spots and the one of the metal letters of truck maker's name."

Newville approached the Booster Club with a proposal to enter into and fund a lease purchase agreement on a 68-in. triplex reel mower for the outfield and a 25-in. walk-behind reel mower for the infield. He says, "This was a pretty big step for our Booster Club. I showed them the improved turf conditions a similar combination had helped us achieve at Putnam North. That information, coupled with the positive initial changes the aggressive maintenance program was producing, motivated them to step up to the plate. We started mowing with the triplex in early November 2000 and added the walk-behind in January 2001. We can now mow every day to get the consistency and quality we're after."

The reel mowers also help with the transition back to bermudagrass. Mowing height is gradually lowered to 5/8-in. This combined with core aeration, the regular fertilization program, and Mother Nature's heat phase out the ryegrass as the aggressive common bermudagrass bounces back.

Newville notes that the school district, under the coordination of Dee Wilson, Putnam City District athletic field manager, provides a finite amount of fertilizer, seed, conditioner, and the field marking chalk. The third source of materials comes through an arrangement worked out with Jeff Foster, David Bonds, and Larry Lindsay of Estes Inc., a local distributor. The company provides additional seed, fertilizer, conditioners, herbicides, fungicides, and pesticides, along with consultation services as needed, in exchange for an advertising sign posted at the field.

Also over the past 2 years additional improvements have been made. Lights have been installed, a permanent outfield fence was erected, and new bleachers have been added. Future projects include: adding a warning track to the wing areas, moving existing bullpens to the outfield, and installing larger dugouts.

Newville has future projects on his mind as well. He'll continue for the third season as a member of the field maintenance staff for Oklahoma City's AAA Stadium, Southwestern Bell Bricktown Ballpark. And, he'll tackle a new field and new challenge moving from the baseball coaching staff to serve as head softball coach.

He says "After working with the RedHawks, I've been determined to bring that same level of safety and playability to our fields. My goal is to provide the safest facility for everyone that comes in to play. Monte's been an excellent resource to help make that happen. I've also just come back from my second STMA Conference. The networking is excellent. It's an unbelievable resource to make the connections so you can just call someone up to exchange ideas and get information. It's an ongoing education process."

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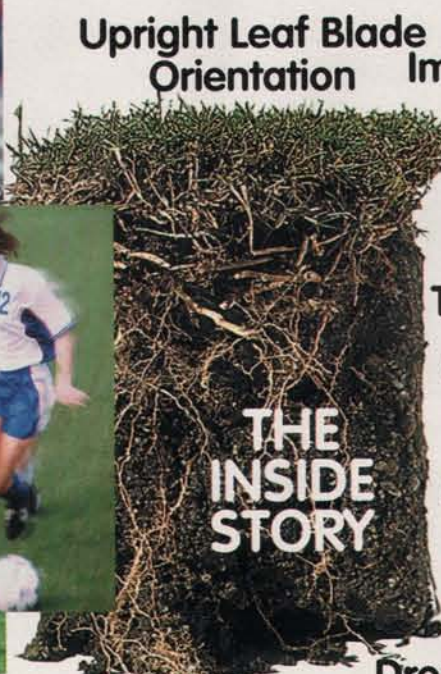
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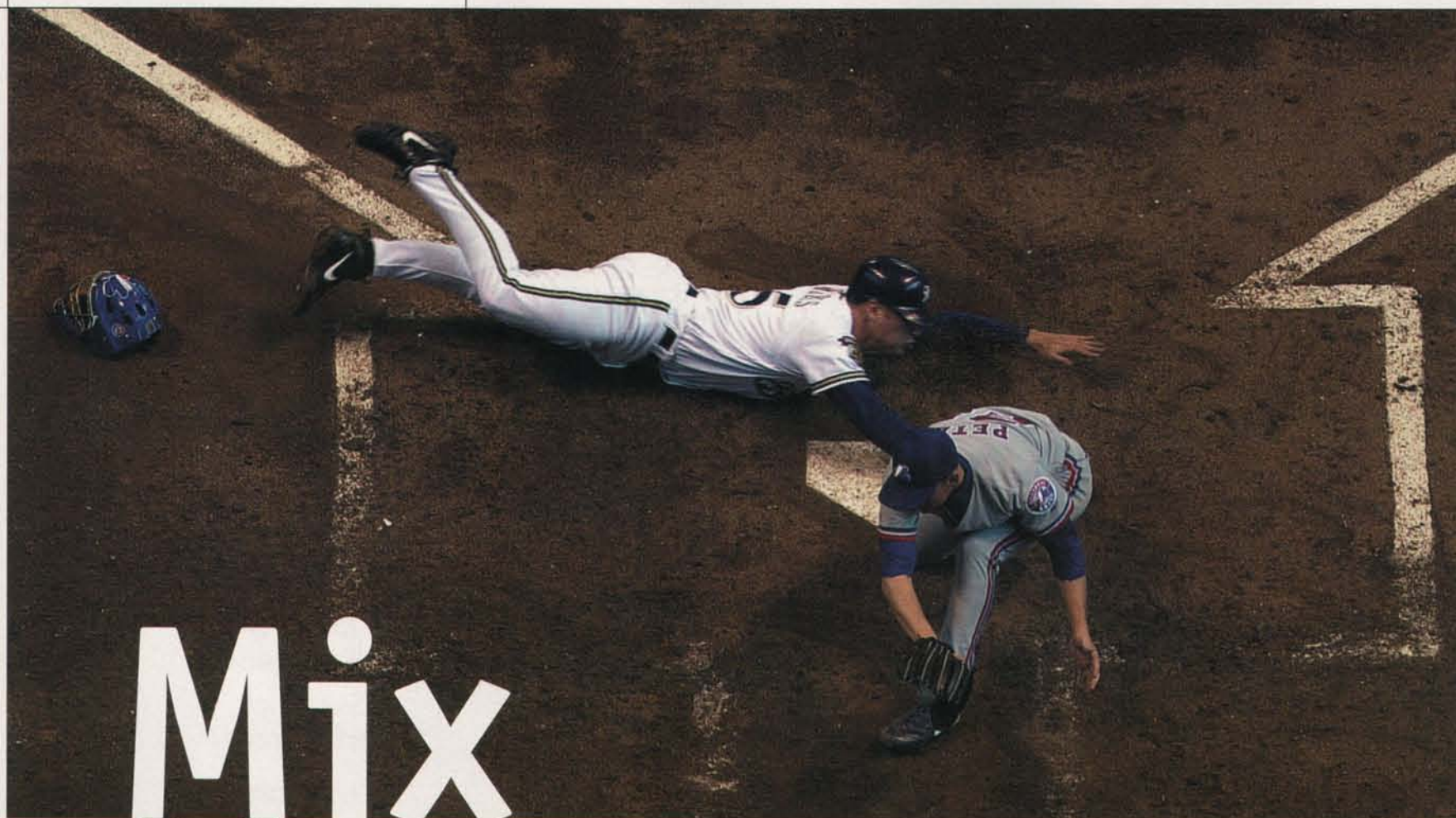
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Developed at the Coastal Plains Experiment Station in Tifton GA by Wayne Hanna, USDA/ARS Geneticist

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Mix Masters

Experts share
their secrets to
establishing and
maintaining a
quality infield

The composition of baseball infields varies from region to region and groundskeeper to groundskeeper. Sports turf professionals face varying climates as well as other challenges. For example, the infield at Qualcomm Stadium, home of the San Diego Padres, is removed and installed each season because of football. According to Southern Athletic Fields, a Columbia, TN, supplier of commercial infield mix, the best infield mix is what works best for the groundskeeper. Many sports turf professionals rely on local suppliers for materials that are native to their area. With such a wide variance in climates, materials and philosophies, how do you know what is right for your infield? To provide some insight into what might work for you, SPORTSTURF magazine spoke with several sports turf managers to determine what works well for them.

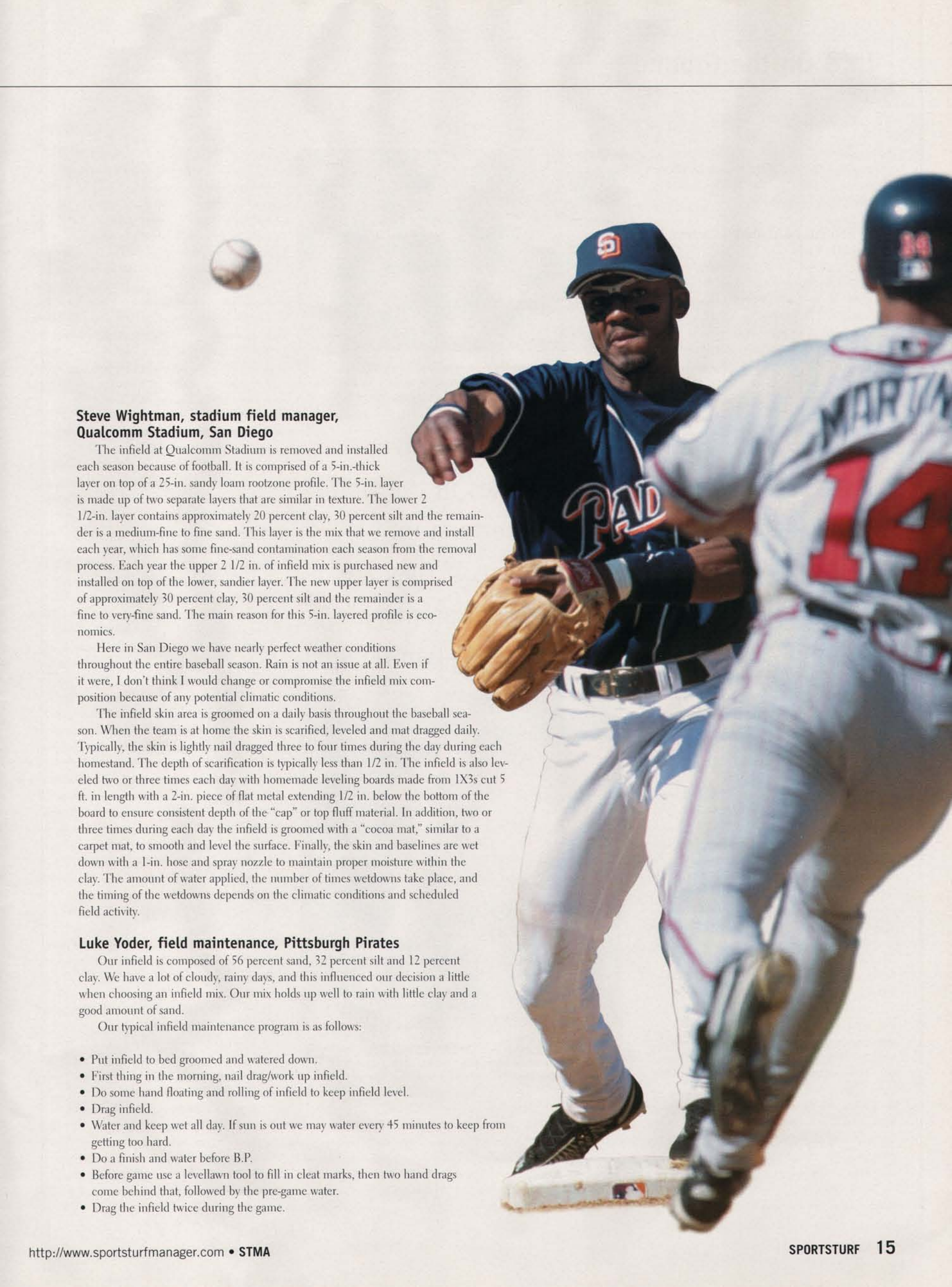
Murray Cook, president, Sports Turf Managers Association

As a rule of thumb, the average clay/sand/silt ratio is 30 percent clay, 60 percent sand, and 10 percent silt. Florida is a bit sandier and less silt. Pro levels will need more clay, but only 5 or 10 percent more.

I have found that clay products are hard to locate, and when you find them it is difficult to keep them consistent. There are different types of infield construction methods for installing the clay. Some people place a filter fabric down before laying the clay on the sub surface. Although I do not entirely agree with this application, it may be useful in the removal of the infield clays if you need to turn your baseball field into a soccer or football field.

The most important tip for infield clays is to establish a 4- to 6-in. base of material that is consistent. When adding soil conditioners only install as a top coat into the first 1/2 in. Some fields need soil conditioners throughout the clay profile to assist with drainage, but if you get the right material down the first time this will not be needed. Maintaining moisture in your clays will also help in the overall management of the surface.





**Steve Wightman, stadium field manager,
Qualcomm Stadium, San Diego**

The infield at Qualcomm Stadium is removed and installed each season because of football. It is comprised of a 5-in.-thick layer on top of a 25-in. sandy loam rootzone profile. The 5-in. layer is made up of two separate layers that are similar in texture. The lower 2 1/2-in. layer contains approximately 20 percent clay, 30 percent silt and the remainder is a medium-fine to fine sand. This layer is the mix that we remove and install each year, which has some fine-sand contamination each season from the removal process. Each year the upper 2 1/2 in. of infield mix is purchased new and installed on top of the lower, sandier layer. The new upper layer is comprised of approximately 30 percent clay, 30 percent silt and the remainder is a fine to very-fine sand. The main reason for this 5-in. layered profile is economics.

Here in San Diego we have nearly perfect weather conditions throughout the entire baseball season. Rain is not an issue at all. Even if it were, I don't think I would change or compromise the infield mix composition because of any potential climatic conditions.

The infield skin area is groomed on a daily basis throughout the baseball season. When the team is at home the skin is scarified, leveled and mat dragged daily. Typically, the skin is lightly nail dragged three to four times during the day during each homestand. The depth of scarification is typically less than 1/2 in. The infield is also leveled two or three times each day with homemade leveling boards made from 1X3s cut 5 ft. in length with a 2-in. piece of flat metal extending 1/2 in. below the bottom of the board to ensure consistent depth of the "cap" or top fluff material. In addition, two or three times during each day the infield is groomed with a "cocoa mat," similar to a carpet mat, to smooth and level the surface. Finally, the skin and baselines are wet down with a 1-in. hose and spray nozzle to maintain proper moisture within the clay. The amount of water applied, the number of times wetdowns take place, and the timing of the wetdowns depends on the climatic conditions and scheduled field activity.

Luke Yoder, field maintenance, Pittsburgh Pirates

Our infield is composed of 56 percent sand, 32 percent silt and 12 percent clay. We have a lot of cloudy, rainy days, and this influenced our decision a little when choosing an infield mix. Our mix holds up well to rain with little clay and a good amount of sand.

Our typical infield maintenance program is as follows:

- Put infield to bed groomed and watered down.
- First thing in the morning, nail drag/work up infield.
- Do some hand floating and rolling of infield to keep infield level.
- Drag infield.
- Water and keep wet all day. If sun is out we may water every 45 minutes to keep from getting too hard.
- Do a finish and water before B.P.
- Before game use a levellawn tool to fill in cleat marks, then two hand drags come behind that, followed by the pre-game water.
- Drag the infield twice during the game.

- Post-game, push material back into position areas, level areas, roll areas, drag infield (different pattern each time), and then hand water infield again if tarp is not going on.

Doug Gallant, head groundskeeper, Cincinnati Reds

We use a blend of sand, silt, clay and Turface Pro League Red that is manufactured off site and trucked in. We use a 100 percent commercial mix approximately 5 inches deep. Our blend consists of 60 percent sand, 25 percent silt, 15 percent clay and 10 percent by volume Turface Pro League Red.

The stadium is located in what is known as the transition zone. The spring is typically wet, summers are warm and very humid, and fall is cooler with moderate rainfall. We want infield clay that will drain quickly, but will also have the ability to retain moisture in hot, dry conditions. The whole key to infield management is water. There is a fine line between too much and too little.

Our infield is nail dragged daily to keep the top 1/2 in. loose. It is then mat dragged to re-establish grade and fill any low spots, and lightly rolled. Then water is applied as needed, usually 2-3 times per day in hot, dry weather. We also use infield tarps to cover the dirt areas when the team is on the road for an extended period. This prevents the infield from drying up and turning into a concrete slab.

Dan Douglas, director of stadium grounds, Reading Phillies

The Reading Phillies' infield is a mix of a variety of materials applied over the last 50 years. The top 6 in. is a commercial mix of one form or another. The top 2 in. is a newer material, slightly different from the bottom 4 in. We use a mix called Professional Diamond-Tex from Martin Limestone, Inc. in nearby Lancaster, PA. It is a manufactured mix, which means they purchase and mix the soils to achieve the desired color and consistency. Professional Diamond-Tex is approximately 60 percent sand, 30 percent silt and 10 percent clay with 100 percent of the particles passing through a #8 sieve.

Reading is on the northern fringes of the transition zone. During the playing season we can bounce around between cool and wet and hot and humid. The Professional Diamond-Tex is slightly lower in clay content than other commercial mixes, which allows it to accept more water during a rain. This allows us to play through some inclement weather. However, the mix has enough clay to provide the base material the stability it needs during ideal playing conditions. No matter what the weather, I can tweak the playing conditions of the skinned area either with a hose or the efficient use of topdressings.

Each spring, at least 2 weeks before the season starts, we will add more infield mix, till, level roll and topdress the infield. The base material will be monitored and leveled as needed throughout the season. Daily maintenance consists of lightly scarifying and screening as needed, topdressing as needed, watering as needed and tarping as needed.

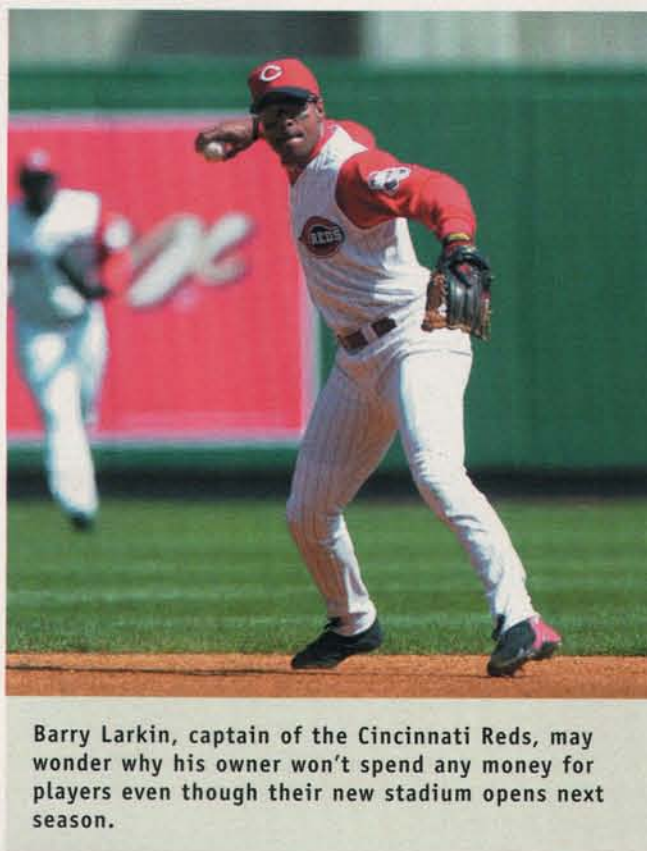
Infield mixes should be considered the base material. This base should be kept free of depressions, but maintain the proper slope to encourage surface drainage. A topdress-



PNC Park's field looks terrific; too bad Buc fans' team is one that Bud Light Selig quotes as having "little or no hope . . . of reaching postseason."

"The most expensive infield mixes in the world will not perform up to expectations if they are not cared for properly."

—Dan Douglas



Barry Larkin, captain of the Cincinnati Reds, may wonder why his owner won't spend any money for players even though their new stadium opens next season.

ing should be applied to this base material. The ball should be bouncing off the topdressing, not the base material (infield mix).

The most expensive infield mixes in the world will not perform up to expectations if they are not cared for properly. Constant leveling, scarifying and screening is essential, but the most important element is water. Excess moisture can be controlled through the use of topdressings. However, many fields lack the ability to add moisture. Dry infields become hard, uneven and unsafe. Before a lot of money is spent on importing an infield mix, a facility should provide adequate access to water and dedicate the resources[dash]both equipment and personnel[dash]to maintain the infield properly to ensure safe playing conditions.

Connie Rudolph, head groundskeeper, Midway Stadium, St. Paul, MN

The infield of our baseball field is composed of a product called Agralime, which is a crushed aggregate (limestone). Agralime is a local source of infield mix coming from Bryan Rock Company, of Shakopee, MN.

The typical climate conditions in Minnesota during the summer are pretty average. We have our extremes, but usually the temperatures are in the 70s and 80s during June, July, and August. The humidity is average to high and our rainfall is also average. Because we do get periods of rain, this infield works well because it drains well. Following a substantial rain we can usually play within an hour after working on the field.

We need to water the Agralime, like other mixes, to keep it moist for optimal playing conditions, but I feel the overall maintenance hours are reduced with this type of infield material because of its drainage capabilities and no need of a tarp.

Our maintenance program is like most others. We have the field graded once a year to keep the slope up and we add a ton of amendment every other year. As needed we edge, fill low spots, nail drag, and sweep the edges. Daily, we water and drag before and after games.

Additional tips I would offer would be to add an amendment as needed to increase water filtration and water holding capacity. If you have a limited labor budget, consider adding irrigation heads that only cover the infield so you can still have control over the infield moisture without wasting a lot of people hours.

John Mott, superintendent, RecSport Grounds, Ohio State

Our base mix is 70 percent clay and 30 percent sand with a geotextile rock barrier at approximately 12-in. depth. The top surface is 100 percent Diamond Pro vitrified clay.

Game conditions vary from 32 degrees Fahrenheit to 100 degrees Fahrenheit. Early spring can be very wet. The summer months can yield very dry and hard conditions. The vitrified clay topcoating helps on both counts. In 2001, we did not have a single rainout when the rain stopped by 1 p.m. Diamond Pro has demonstrated excellent characteristics for helping keep some moisture in the base material during dry periods and letting us get on the skin shortly after wet periods.

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Sports
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The skin to turf threshold is edged a minimum of three times a year. If conditions dictate we will edge more often. Usually a student can maintain these by hooping the vegetation on a weekly basis. The batter's boxes and pitching areas, which are lined with clay bricks, are repacked as wear dictates. The areas around the bases, which tend to get excessively worn out, are repacked once a week. This requires the moving back of the top layer of Diamond Pro and packing with a small driveway roller. The fields are level dragged

once each week with a drag

designed to put material in the low areas and cut it off the high areas. Daily maintenance is done by using either a mat drag or a Kromer with a broom on the back. We usually wet down the skin with dust control irrigation before starting the daily grooming.

We use a leveling type drag to maintain grade, fill low areas, and remove high areas. A Kromer with a scarifier, water tank, and broom on the back are used to do finish work. A Cushman with a mat drag may be substituted for the Kromer.

Heather Nabozny, field superintendent, Detroit Tigers

The base of my infield skin consists of a loamy soil. The mechanical analysis is 15 percent clay, 46 percent silt and 39 percent sand. The infield soil is native to Ohio and is custom blended for our field.

Here in the Metro Detroit area of Michigan our climate varies. Our spring is typi-

Moisture management is the most critical maintenance practice we do to ensure a consistent playing surface.

—Mike Boekholder

cally wet and mild 50s to 70s. Our summer is generally a mixture of sun and rain, with temperatures in the 70s to 90s. During the fall our temperatures go back down to the 50s to 70s, and we get a mixture of sun and rain.

The main reason that I continue to use this type of infield soil mixture is because it has a considerable amount of silt, which softens up well with water. However, it is not so soft (loose) that players would lose traction.

I wet the infield skin between 3 to 6 times daily depending on the weather. We nail drag it daily and we use small nail drags that we walk by hand. We then mat drag again and rewet. We follow up the rest of the day with waterings. We drag between home and visitors batting practice and then again at pre-game. We drag three times during the game. Post game we rake and broom the clay from the lips, rake up the debris into piles and remove them from the skin. We then drag the skin one more time before we leave for the night.

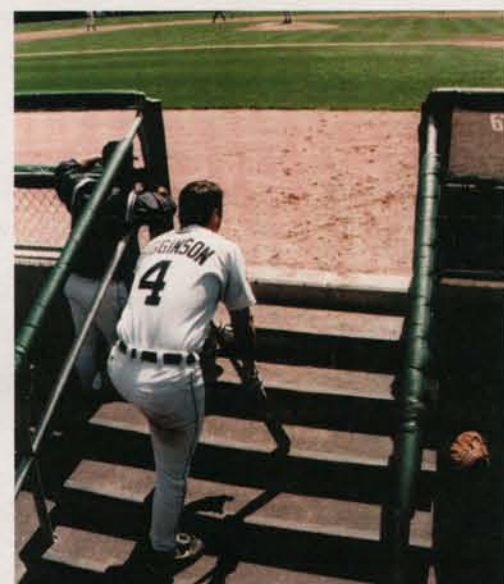
Mike Boekholder, head groundskeeper, Victory Field, Indianapolis Indians

Our infield mix is composed of approximately 30 percent Tennessee red clay, 8-10 percent silt and 60 percent angular fine to medium sand. All of our infield mix has been purchased from the same supplier. It is a blended material; the supplier blends the clay percentage up to the amount we prefer. The mix is just the sand/silt/clay mix. There are no other additives, such as calcined clays, etc. We blend Stabilizer powder into the mix ourselves each fall and top our infield skin with a combination of Diamond Pro vitrified and calcined clay infield conditioners weekly throughout the playing season.

We have typical Midwest weather, lots of thunderstorms and heavy downpours in the spring and summer. We do have a lot of humidity. I use a mix that is a bit on the sandy side, because I like the way it packs and retains its moisture. I'm not sure that I would increase my clay content more even if I didn't have as much rain to deal with on a daily basis. Our infield depends on surface drainage primarily to remove excess moisture, not percolation of the excess moisture through the infield mix.

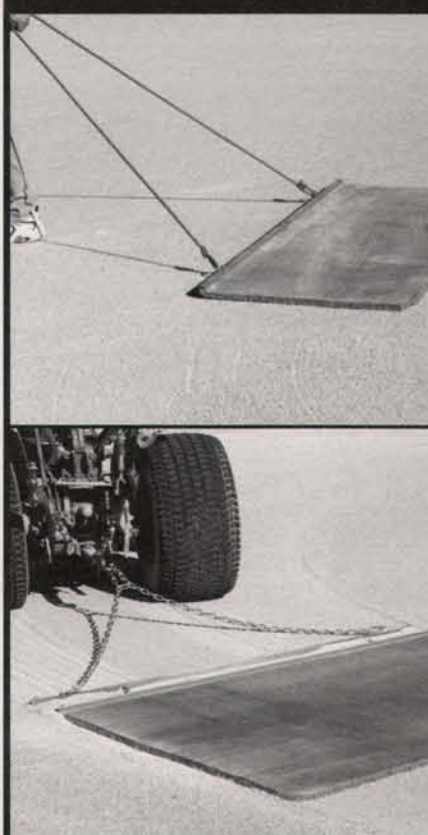
Our infield is watered several times a day, even when the team is out of town. Moisture management is the most critical maintenance practice we do to ensure a consistent playing surface. On game days, the infield is nail dragged by hand and mat dragged by hand. We alternate dragging directions to ensure that the grade is maintained as close to specifications as possible. We add infield conditioner on a weekly basis to maintain the proper top cushion on the skin. Edges are broomed nightly after games, and power washed with a high-pressure hose nozzle at least once a month to ensure no lips build up. The infield skin is raked with a field groomer and rolled after each game.

We groom our infield primarily by hand with a 3 x 3-ft. homemade nail board. We mat drag with 6 ft., 6 in.-wide homemade mat drags, again pulled by hand. After games, a John Deere 1800 field and bunker rake is used to "rake" the infield, removing all cleat marks from the skin. We use a sand trap type rear attachment as opposed to a tray groomer that would simply smooth the surface rather than raking it lightly. This unit is not used to put a finished surface on the infield, but rather to remove cleat marks from the clay base of the infield.



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