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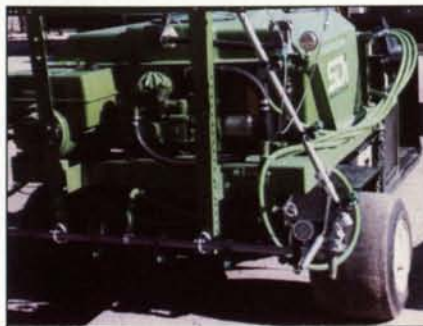
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VOLUME ELEVEN, NUMBER FIVE

MAY 1995

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14 *Coors Field: A Rocky Mountain Highlight*

Mark Razum, head groundskeeper at Coors Field in Denver, faces the challenge of keeping the ballpark in perfect condition — despite not-so-perfect weather conditions. Razum, who has been widely praised for his work on the Oakland Coliseum field, shares some of his techniques in this profile.

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33 *Integrated Systems for Controlling Aquatic Weeds*

Lakes and ponds at golf courses and horse-racing tracks require careful maintenance to control weeds. While chemical methods have been very successful in controlling weed infestations and are generally easy to use, many facility managers are looking at natural methods of controlling weeds due to environmental concerns.

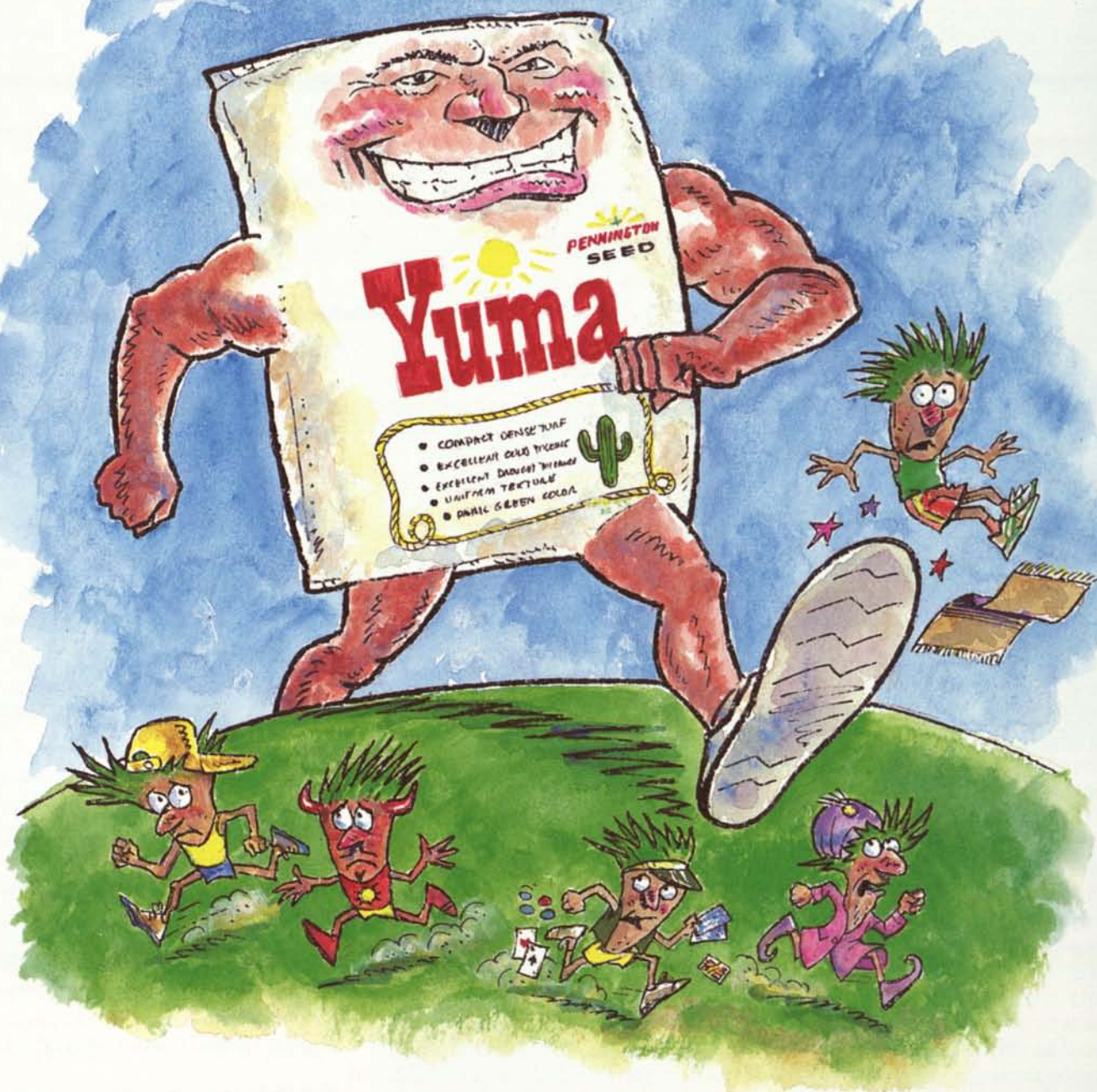
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On the Cover:

The Colorado Rockies played to a full house at the opening of Coors Field, their new home ballpark in Denver. Photo courtesy: Nate Cox/Rich Clarkson and Associates.

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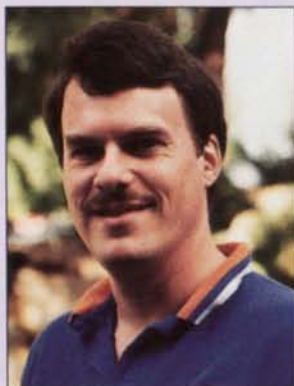


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THE FRONT OFFICE

OPINION PAGE



Standing Ovation

While many people haven't quite forgiven the major-league players and owners, baseball is nevertheless back in full swing, and changes are not limited to the personnel on major-league rosters.

In Denver, the Colorado Rockies have moved out of Mile High Stadium to a brand-new ballpark, Coors Field. Mark Altman, who served as a consultant on the project, gives us a behind-the-scenes look at

the process of building a new baseball field.

Coors Field is a state-of-the-art facility, from the irrigation and drainage systems to soil composition and field maintenance equipment. Turf for the diamond was grown in a carefully controlled environment, and the field is equipped with a special heating system to protect the turf in extremely cold weather and provide the best possible playing surface for the players even when the outdoor temperature is more suitable for skiing than baseball. These innovations in field design should make life a little easier for head groundskeeper Mark Razum, who is profiled in this issue as well.

Meanwhile, American League teams will no longer have to play on artificial turf in Kansas City. The Royals have joined their football counterparts, the Chiefs, in going to a new natural-grass surface at Kauffman Stadium. The Royals made the best of a bad situation by using the strike period to renovate the stadium. Details on the renovation will be included in a future issue of *SportsTURF*.

One of the most important changes made in the renovation was the regrading of the field. Now outfielders won't feel like they are throwing uphill when they throw back to the infield. Maybe when these players file for free agency or arbitration, they should offer some of the money they are making to the field designers and groundskeepers who make it so easy for them to play well.

The folks in Boardman, OH, are proud of the remodeled baseball facility at Boardman High School. Dave Dravecky Field, named for the former National League pitcher whose career was tragically cut short when he lost his pitching arm to cancer in 1989, is a shining example of what can happen when a community comes together with a singular goal. Dravecky's father is among those who were involved in the effort to renovate the field, which was selected as the Beam Clay 1994-1995 School Baseball Diamond of the Year.

Maybe the major-league players and owners haven't earned our respect — perhaps they never will. But the field designers and groundskeepers have done an outstanding job with these fields, and they should be appreciated for their hard work. Perhaps baseball fans should reserve their loudest cheers for the middle of the fifth inning when the grounds crew comes out to sweep the field and change the bases.

Mike Augsdorfer

Mike Augsdorfer

EVENTS

CALENDAR

JUNE

22-24 Sports Symposium and Trade Show, Baltimore, MD. Contact: Vince Angotti or Jim McIntyre, Towson State University, (410) 830-2384.

25-26 National Lawn and Garden Marketing Conference. Stouffers Renaissance Hotel, Denver, CO. Contact: Bob Mikulas, (719) 488-8050. Fax: (719) 488-8168.

28 Modern Arboriculture: The Science Behind the Treatment, a daylong seminar led by Dr. Alex Shigo. Six ISA CEUs and seven PAC, QAL and QAC CEUs have been approved. Sequoia Conference Center, Buena Park, CA. Contact: Ted Stamen & Associates, (909) 656-3431.

JULY

19-20 Fourth Annual Midwest Grounds Management Conference, Illinois State University, Normal, IL. Contact: Mike O'Grady, (309) 438-2032 or e-mail: meogrady@ilstuedu.

26 Turfgrass Field Day, sponsored by the University of Georgia and the Georgia Turfgrass Association. Georgia Experiment Station, Griffin. Contact: (404) 975-4123.

26-28 Summer Convention and Field Days, sponsored by the Turfgrass Producers International. Omaha, NE. Contact: (800) 405-TURF or (708) 705-9898.

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Wrigley in the Rockies

By Mark Altman

If groundskeepers took an oath, the first pledge would be, "I will have my field in top form for opening day." That goes triple this season for groundskeepers at major-league baseball stadiums. The fields were the only thing ready to go last month when the players strike that shut the game down after the '94 All-Star break was resolved.

The real losers last year were the fans, especially season ticket holders. The Denver Metropolitan Major League Baseball Stadium District has given fans an extra reason to go to the ballpark—the debut of Coors Field, a new stadium that combines nostalgia, comfort and natural turf.

Designed by HOK Sports Facilities Group for the two-year-old Colorado Rockies, Coors Field features the intimate fan contact of Wrigley Field and a surface that has championship written all over it. Mark Razum, head groundskeeper at Coors Field, joined the Rockies last October. "I like to get feedback from the players," says Razum. "During the pre-season this year, I had to rely on past experience because the regular players were on strike. [Rockies manager] Don Baylor made it clear he wants a fast surface."

Coors Field was designed to be both fan- and player-friendly. The "batter's eye" in center field is a sod nursery, a perfect green background for 90-mph fastballs



Coors Field, new home of the Colorado Rockies, is a Rocky Mountain gem day or night. Photo courtesy: Rich Clarkson and Associates/Colorado Rockies.

or nasty curve balls. The infield is fast, and the basepaths are on the firm side to favor the lightning instincts and speed of a young team. Razum is taking steps to speed up the outfield as well. Baylor wants his players to be ready when they compete on artificial turf out of town.

New Approach to Compatibility

Coors Field has sand-based Gravi-Turf construction, a design patented by Randall & Blake, Inc. (RBI), of Littleton, CO. The growing medium is a mixture of 90-percent silica sand and ten-percent reed sedge peat, which is placed on top of pea gravel. These physical standards were recommended by Chuck Dixon of Turf Diagnostics for RBI. My company, Altman and Altman, was the turf and soil fertility consultant for the Denver district. I had worked with RBI before on Foxboro Stadium for the New England Patriots and at the Denver Broncos training facility.

Dan Almond, RBI's landscape architect, quarterbacked the installations of Gravi-Turf fields at Foxboro, at Kauffman Stadium for the Kansas City Royals, and for the Broncos. "The beauty of sand-based fields is their ability to drain rapidly," Almond remarks. "Water anywhere on the field has to travel only eight feet to reach a drainpipe with our system. We guarantee that our fields will withstand five inches of rainfall per hour and still be playable."

Since the stadium is at an elevation of

nearly 5,000 feet, foul territory and the area around home plate are shaded during most of the winter, and snowfall in April is common, the Rockies also wanted field heating. The construction schedule for the stadium did not allow enough grow-in time if the turf was seeded. RBI could not get on the field until October 1994, and an exhibition game with the Yankees was scheduled for March 31, 1995.

The first steps were taken in the spring of 1993 when Charles Nicola, project manager for the stadium district, called a meeting with Almond, Dr. Tony Koski of Colorado State University, Tom Lujan of the Denver Broncos, Steve Wightman of San Diego Jack Murphy Stadium and me to select the turfgrass varieties for the project. Four Kentucky bluegrasses (A-34, Adelphi, Banff, and Touchdown) and two perennial ryegrasses (Saturn and Omega II) were selected.

The next step was to locate a sod grower who understood sports turf and the importance of compatibility with sand-growing media. Four growers were interviewed. RBI had worked before with Graff's Sod Farm of Fort Morgan, CO. Randy Graff had grown the sod for Kauffman Stadium and for Soldier Field during the World Cup Soccer matches.

A Unique Choice

The turf committee then made an important decision to prevent incompatibility problems: Instead of trying to match the growing medium of the stadium field to the sod farm or washing the sod before installation, a specified mix of sand and peat would be installed at both the field and the sod farm. "We had the luxury of time and wanted to take every step possible to prevent interface problems," says Almond.

In May 1993 the first of 600 tons of silica sand mixed with peat started arriving at Graff's Sod Farm 60 miles northeast of Denver. "We spread the mix 1.5 inches deep over a three-acre, pie-shaped section of our field," recalls Graff. "We laid plastic netting down before seeding. We irrigate with a center pivot that covers 123 acres in a single revolution. Our soil here is already 85-percent sand, so we already have good drainage. It was a real challenge keeping the growing medium evenly wet so the seed would germinate."

Another three-acre section of Graff's farm contained the sod for Kauffman Stadium at the same time. "It turned into a contest to see which sod looked the best," Graff adds. "The Kauffman job included a new, hard-to-get Kentucky bluegrass called Princeton 104. When the Coors people visited the farm, they noticed how good the P-104 looked. This variety was overseeded into Coors Field after it was installed."

Because the sod was growing in a basically inert medium, I was asked to develop a complete physical management and nutrition program. Tectonic, the supplier of the sand, provided samples for us to test in advance. I developed a program for Graff to build up basic nutrients in the sand and peat mix before it was seeded. This included diammonium phosphate (18-46-0), potassium sulfate, and a chelated iron and manganese source called Ruffin.

In June, after the seed was sown, we supplemented with Roots (three ounces per 1,000 square feet) and Nutriculture (12-31-14). Nitrogen and potassium were applied monthly through the irrigation system. We didn't core-aerify because we couldn't mix the subsoil with the growing medium. We used an Aer-way tine aerifier a couple of times to prevent development of a perched water

table at the sod/subsoil interface. That fall, the sod was toppedressed with the sand/peat mix. Because we were pushing the sod, we also applied PCNB, Spotrete and a sealer in the fall to prevent snow mold. The farm did receive a typical amount of snow cover that winter.



Soil and tissue samples were taken every six weeks and sent to Servi-Tech in Dodge City, KS, for analysis. Graff or I made the necessary adjustments. We followed this routine for 16 months.

As fall approached, the originally planned September date for installation of the sod was pushed back more than a month. This put a great deal of pressure on all of us since we now had to get the sod established in the stadium during the worst part of the growing season.

The month before the sod was cut, a number of changes were made to prepare the sod for Coors Field. Until this point, Graff had mowed the sod with an 18-foot-wide reel gang mower. Both Mark Razum and I suggested that Graff begin mowing the sod every day in different directions with a triplex reel mower. Razum planned to use a Ransomes Motor 180 at Coors Field, so the same mower was used at the farm. "I was amazed how much thicker the sod became with multidirectional mowing on a daily basis, and I've been growing sod for 20 years," Graff remarks.

Three weeks before harvesting, we started a program to stiffen the grass, reduce transplant shock and improve rooting following installation. We applied Nutriculture (28-8-18) along with Roots Fe, AquaGro L wetting agent and a complete package of trace elements. We wanted the turf to build up carbohydrates within the plant before it was cut. Twelve days before the sod was harvested, we made a foliar application of Nutriculture (12-31-14), Roots Fe, Agri-Plex For-X and

Aquagro L. This combination was also applied seven days before cutting.

Meanwhile, we had to build up the nutrition of the sand/peat growing medium once it was installed at Coors Field. Tectonic supplied us with a sample of the mix to be used at the stadium

Both Altman and Razum suggested mowing the sod every day in different directions with a triplex reel mower at Graff Farms. Photo courtesy: Mark Altman.

for testing. From that sample, we developed a mixture of nutrients to be mixed into the top three inches of the field. That mix consisted of Sustane (5-2-4), Par-Ex (10-18-22), Par-Ex coarse (31-0-0) and diammonium phosphate (18-46-0).

The field construction process reached a climax in October. The subsoil had been graded with shallow, V-shaped channels every 16 feet. Drainpipe was installed in the center of each channel, and the subgrade was covered with four inches of pea gravel. The irrigation mains and laterals and electrical heating cable were placed on top of the gravel. Finally ten inches of the growing medium were distributed and leveled to provide a flat surface.

Once the fertilizer mixture was applied to the field, it was incorporated into the top three inches by making three passes over the field with a nail drag. The risers and Hunter heads were installed, and one inch of water was applied.

Over a six-day period 120,000 square feet of sod were cut and installed at Coors Field. RBI coordinated closely with Graff's Sod Farm so that the sod was cut only in amounts that could be laid in one day. Graff first wet the sod to help the sand stick together and then cut 42-inch-wide rolls with a Bucyrus sod cutter.

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Coors Field

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Once a section was completed, the sod was sprayed with a mixture of Nutriculture (20-20-20), Roots Fe, Agri-Plex For-X and AquaGro L. A second application was made ten days later. In addition to the foliar treatments, a dry combination of Par-Ex and Sustain was applied. A soil test taken on November 4 and the expected dormancy of the turf by mid-December indicated that the remaining fertilizer applications should focus on potassium, phosphorus and micronutrients. I recommended a combination of triple super phosphate, potassium sulfate and two different Ruffin products to supply iron, zinc, copper and manganese. In late November a final feeding of potassium sulfate and Sul-Po-Mag (11-22-11) was recommended to harden the turf for winter.

As the sun's path moved farther south each day, home plate and part of the diamond were in shade much of the time. Different microclimates within the field became obvious. Separate maintenance programs were needed for these

areas. The electric heat helped us in March. Razum ordered Evergreen covers for the infield and foul territory along first and third base.

Razum went shopping for equipment before Christmas. Except for the Ransomes Motor 180 and the Grayco line machine, he bought Toro products. Razum purchased two walk-behind greensmowers for the infield, a topdresser, two walk-behind aerators, two utility vehicles and a MultiPro sprayer.

In January, I tested the field soil for the last time. The results showed that micronutrients were on the low side. However, the tissue test results showed no problems. I recommended applications of micronutrients beginning in early March and wrote a dress-up program for opening day. On February 17, 1995, the Denver Metropolitan Major League Baseball Stadium District turned Coors Field over to the Rockies.

A decision was made to turn on the electric heat and wake up the infield a month before the outfield was expected to come out of dormancy in March. Razum covered the infield with Evergreen covers to hold in the heat. "We put them on at night

and took them up every morning at 10 o'clock," Razum explains. He borrowed a Toro HydroJect to aerify the field with minimal surface disruption and hand-watered some areas of the outfield.

"We had two inches of roots in the infield and five inches in the outfield," says Razum. "But the infield was starting to catch up in April. We apply soluble fertilizers every ten days and rely heavily on slow-release nitrogen products from Par-Ex and Scotts. The color is great and really shows off the mowing patterns. We're mowing the infield just under one inch and plan to drop the outfield to just over an inch."

If anything can settle the nerves of players this spring, it will be Coors Field. Thanks to a group effort, Denver baseball fans have their own Wrigley in the Rockies. □

Mark Altman has a degree in agronomy and soil science from Purdue University. He and his wife, Sandy, operate Altman & Altman, a turf fertility consulting firm in Marshall, MN, specializing in high school, college, park and stadium sports fields.

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