

perform well at lower fertilization levels. Some tolerate higher salinity; some tolerate shade. Some varieties can withstand short periods of excess moisture.

Researchers also are working with endophyte (technically, any plant that grows within another plant, such as certain fungi or algae) "enhanced" turf varieties which are resistant to specific insects. Advances in genetic engineering now on the horizon may be able to take turf development further and faster than all the previous more traditional plant breeding methods.

The performance of each grass variety will differ according to the soil profile, pH, nutrient levels, irrigation pattern, mowing regime, temperature and humidity patterns, amounts of sun and shade, wind conditions and other components of its maintenance "package" and the unique micro-climate of its site.

Importance of Quality

The National Turfgrass Evaluation Program (NTEP), with headquarters in Beltsville, MD, collects, compiles and distributes data from tests conducted at a wide variety of sites across the country. Additional testing is conducted by university turfgrass extension personnel and by the seed companies. For recommendations on varieties that will perform as desired on specific site conditions under specific maintenance practices, contact local representatives of seed suppliers and the extension service. Also check with other sports turf managers who face similar situations to see what varieties have worked best under actual field conditions.

To build on the strengths of each grass variety and minimize the weaknesses, a combination of varieties can be used. A grass blend combines varieties of one grass type, such as several different bluegrasses. A grass mix combines varieties of two or more grass types, such as varieties of bluegrasses and varieties of perennial ryegrasses. Seed suppliers package blends and mixes of selected varieties that combine the best characteristics for specific uses. Again, check these mixes and blends for performance under specific conditions, including actual field use.

Because turf seed is a crop, the availability of certain varieties may vary according to weather conditions during the growing and harvest seasons. Seed costs also are variable, rising or lowering according to supply and demand.

It's important to start with high quality, viable seed. Check the label. State laws regulating the sale of turfgrass seed

require certain information to be stated on the seed label. Requirements vary somewhat by state, but generally include: the name of the producer or seller; the seed lot number; the type of seed; the seed variety — if a named variety is claimed; the purity (given as a percentage); the rate of germination (given as a percentage); and the date the seed was last tested for germination. Filler — non-seed, inert materials — must be listed as a percentage. Weed and/or crop seed also must be listed as a percentage present. Noxious weed seeds must be listed by name, along with the amount present (generally given as the number of seeds per pound).

Certification programs assure that seed is of the purity and germination rates listed on the label and is "true" to variety. Named varieties and certified seed will cost more than non-certified seed and "generic" seed.

Don't skimp on quality. It's a tough world out there, and a certain percentage of even the best quality seed is bound to fail. Why start with less than the best? The initial cost of the seed is small in comparison to the labor and material costs — and the time investment — required for mature turf to develop from seed.

Getting Started

Proper preparation and follow-up are critical. Use soil tests to check pH and nutrient levels, and correct deficiencies according to test results. Prepare the area with aeration, surface cultivation, top dressing or a combination of these so that the seed will have the best possible growing conditions. Select application equipment that will ensure good seed-to-soil contact.

Irrigate as required to keep young seedlings viable. Gradually adjust the light, frequent irrigation used during the germination and early growth periods to less frequent, deep watering to encourage deep rooting in the mature plants.

Mow the young grass when it reaches mowing height, rather than allowing it to become overly long. Follow the one-third rule, removing no more than one-third of the grass blade with any one mowing.

Finally, control use. Sports turf is under as much stress as players bound for the Super Bowl or the World Series. Don't put tender grass plants into the challenge of the game until they're adequately prepared. □

Steve and Suz Trusty are partners in Trusty & Associates, a consulting firm located in Council Bluffs, IA. Steve is executive director of Sports Turf Managers Association.

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In a field northeast of Palm Springs, CA, workers harvest and roll sod destined for the Super Bowl in Phoenix.

Evolution Of A Super Field

By Stephen Guise

Anyone lucky enough to attend a Super Bowl knows first-hand that its "hoopla" is truly an experience of a lifetime. But it's not all fun and games. Since the National Football League accepts nothing but the best playing field for its ultimate game, preparation for the Super Bowl starts months ahead of time.

For this year's Super Bowl, and perhaps for subsequent ones, it began in October 1994, when devastating frost and ice hammered Florida and the East Coast's turfgrass industry. The damage caused a shortage of the preferred overseeded Bermudagrass sod. Needing a playing surface for the 1995 Super Bowl at Joe Robbie Stadium in Miami, NFL consultant George Toma knew he had to look west and contacted West Coast Turf, a Southern California turfgrass sod producer.

Just days following his call, 28 truck loads of refrigerated thick-cut sod rolled out the gates of West Coast Turf for a 3,000-mile trek across the country. The on-site stadium crew, rounded up by groundskeeper Alan Sigwardt, helped Toma install the new field in record time. The field, come game day, was outstanding. It was then, one year away from the 1996 Super Bowl at Sun Devil



As in years past, the sod for this year's Super Bowl was raised and laid under the direction of George Toma. Photos courtesy: West Coast Turf.

Stadium in Arizona, that the NFL decided to purchase the field for this year's Super Bowl.

Many sports turf managers have questioned this move: Why would anyone purchase a new field one year prior to a game without knowing the condition of

the existing field? The answer is easy when one understands the calendar of events at Sun Devil Stadium. It hosts Arizona State University, the NFL's Arizona Cardinals, and the Tostitos Bowl (Fiesta Bowl), which was played just three and a half weeks before the Super Bowl. The NFL's field team knew that this amount of play would be too much to handle.

The evolution of advance planning for the best possible playing surface had been reached. After 30 years of preparing the field for Super Bowls, Toma would finally have the field of his dreams, without the ulcers.

Twelve months prior to the game between the Steelers and Cowboys, the sod was purchased and prepared in the warm climate of Bermuda Dunes, CA, located just northeast of Palm Springs. In November of this past year, Joe Foster, vice president of West Coast Turf, explained the condition, "I had roots down eight-plus inches and the Tifway Bermudagrass was thriving. We overseeded the fields with a blend of perennial ryegrass at a rate of 30 pounds per 1,000 square feet in October."

As fall approached, Foster applied Primo, a growth regulator, to slow down the actively growing Tifway 419

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Super Bowl Sod

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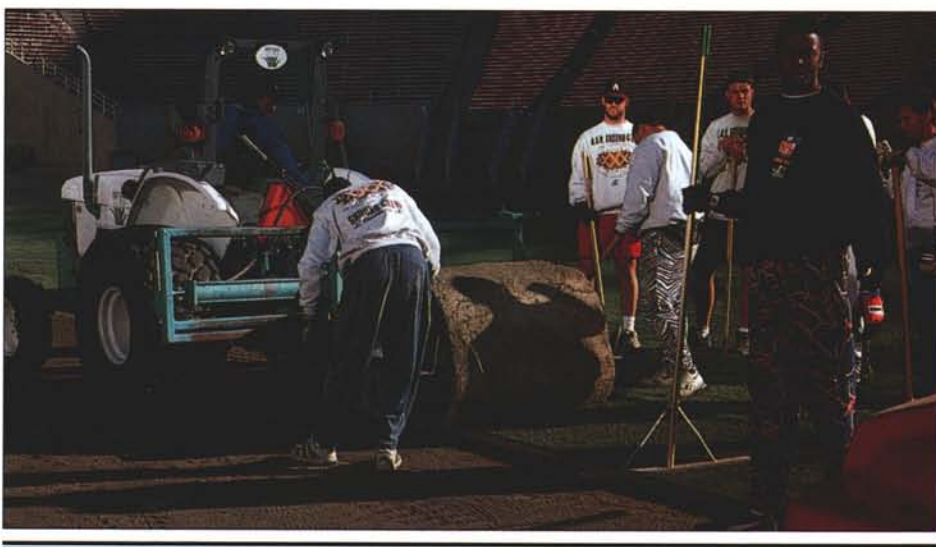
Bermudagrass and to reduce the competition for the overseeding process.

The fertility programs were kept at one pound of active nitrogen per month using urea as the source. Prior to overseeding, an application of pre-plant fertilizer (6-20-20) was applied at the rate of 400 pounds per acre. Sulphate of potash had been applied to harden off the grass 30 days prior to the harvest date. This would aid the turfgrass in the event of a potential frost. The grass was manicured and cut at a height of 7/8 of an inch and was ready for delivery. Within four weeks, by December 1st, the fields were dark green and lush.

In an area of the state where produce is grown, turfgrass thrives. The weather patterns this year have been challenging throughout Southern California and particularly in the high desert area of Bermuda Dunes. Ammonia nitrate was used during the cooler periods for a nitrogen fertilizer. Foliar applications of Sprint, an iron micronutrient fertilizer



Rolls of sod sit aboard trucks ready to make the trip to Sun Devil Stadium.



The Super Bowl XXX crew lays the two-inch sod as soon as it arrives.

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produced by Ciba-Geigy, were applied weekly at the suggested label rate, starting three weeks prior to harvest, to increase the turf's natural color.

As the East Coast was spreading urea on snow and ice during the worst storm to hit the Northeast in 70 years, Toma awaited his best friend to arrive at sunny Sun Devil Stadium: green grass! The huge rolls of two-inch-thick sod came rolling in on January 5th, just 23 days before the big event. It took only three days to lay the new turfgrass on the warm soil of Arizona. George Toma's Super Bowl ground crew — including Ed Magnum, groundskeeper for the World Series Champion Atlanta Braves — were together again.

It takes many people from around the U.S. to prepare the Super Bowl field each year — people from many walks of life, with separate expertise and

personalities. Glued together as a team with a common goal, they provide the best playing surface for the enjoyment of millions of observers and for the safety of players who gained the opportunity to represent their fans on that winter afternoon in January.

But that is only part of the Super Bowl turf's story. After the big day, Sun Devil Stadium manager Don Follett had to start "deconstructing" the field, to bring the heavily overseeded turf back to a 100-percent Tifway 419 Bermudagrass field. Look for "Super Bowl Field — Post Game Report" in an upcoming issue. □

Stephen Guise, of Guise & Associates, Fullerton, CA, is a chairman of the Sports Turf Managers Association and is co-chairman of their Technical Review Committee.

CHEMICAL LOG

Quick-Release Fertilizers For Fast Green-Up

By Helen M. Stone

Dr. Alex Shigo, noted tree expert, often speaks about an industry-wide fallacy — that we can “feed” trees, shrubs, turf and other plants. In reality, plants manufacture their own food through photosynthesis. Elements from the air, water and soil are combined and altered in order to provide the starches plants use for energy and growth. Therefore, we cannot feed a plant.

What we can do is provide all the essential elements a plant needs in order to manufacture its food. The warm temperatures of springtime bring a flush of growth that can deplete a plant's energy reserves if any elements are deficient. However, applying large quantities of fertilizer with an “it can't hurt” attitude is no longer the way to go (if it ever was). Excessive fertilization is not only a waste of time and money, but, especially with soluble nitrogen, it can be a potential threat to groundwater, streams and ponds.

Greening Up

Turfgrass is probably the most demanding plant when it comes to regular fertilization. Proper turfgrass fertilization not only ensures a beautiful playing surface, but also will help discourage insects and diseases. Striking the proper balance (in terms of adequate potassium levels) can even help turfgrass withstand drought.

Nitrogen (N) is especially important to proper turfgrass growth, although phosphorus (P) and potassium (K) also are important. The latest information from the University of Massachusetts states that turfgrass uses N-P-K at a ratio of approximately 4-1-2. Purchasing fertilizers with this ratio should give you good results.

Since nitrogen is the most used (and abused) nutrient, it pays to know a little bit about how it works. Nitrogen is essential to chlorophyll and protein formation. However, in order for the plant

to absorb nitrogen, it must be in the form of an inorganic nitrate ion (NO_3). In some cases, plants also use ammonium (NH_4^+) and amino (NH_2^+) ions.

An ion is simply an atom, molecule or compound that has a negative or positive charge. Ions are attracted or repelled by other ions, depending on the charge. Soil particles have a negative charge. Therefore, positively charged ammonium ions are held by the soil. Negatively charged nitrate ions, on the other hand, have no attraction to the soil particles and are easily leached.

In nature, most nitrogen is in an organic form. Soil microorganisms convert the nitrogen to an inorganic form through a process called mineralization. The number of soil microorganisms, temperature and moisture all affect the mineralization process.

One other term you will frequently hear in regard to nitrogen is “salt index.” Water is attracted to salt. If the salt content in the soil is high, the water actually moves from the plant to the salt in the soil. This causes “fertilizer burn,” which, in essence, is simply leaf dehydration.

Organic or naturally derived fertilizers release nitrogen at a relatively slow pace over a period of several weeks or months because they rely on soil microorganisms to mineralize the nitrogen. Ureaformaldehyde (UF), isobutylidenediurea (IBDU), and sulfur-coated urea are manmade, but also considered slow-release. All are insoluble in water. They are normally low in salts, so the chance of burn is small to nonexistent. Applying slow-release fertilizers will not result in a rapid flush of growth. Finally, there is little potential for leaching and volatilization (conversion to a gas).

However, organic and slow-release fertilizers have been very slowly accepted. Fast green-up is often required. In addition, organic fertilizers are more expensive per unit of nitrogen. Finally, if the soil-microorganism population is low,

nitrogen release can be too slow for satisfactory results.

Quick-release fertilizers have been the primary choice of turfgrass professionals for decades. Ammonium nitrate, ammonium sulfate and several other quick-release fertilizers are all soluble in water. The low cost and fast results can make both players and accountants happy. In addition, because no microbial activity is necessary for mineralization, the nutrient is available even when soil temperatures are low.

However, quick-release fertilizers do have a few disadvantages. Most have a high salt index, and can burn plants if applied too heavily or if temperatures are very high. Because they release nitrogen quickly, they must be reapplied about every six to eight weeks. Finally, they have a higher potential for leaching and volatilization than slow-release fertilizers.

In recent studies conducted by soil scientist Sterling Olsen, fertilizer-use efficiency increased when both nitrate (quick-release) and ammonium (slow-release) fertilizers were combined. He also noted that combining the two types of fertilizers minimized leaching. Although his studies focused on corn plants, corn is a monocot just like turf, and considered a “heavy feeder.”

If you don't have the time or energy to blend your own fertilizers, don't worry. There are several commercially prepared fertilizers that combine quick- and slow-release forms of nitrogen all ready to go. Many also contain micronutrients, humates, enzymes and other biological “boosters.” These formulations can give you the best of both worlds in one easy application. The only drawback might be the initial cost. However, most will last all season long, saving time, labor and money in the long run.

If you are ready to refine your fertilization program, this spring is a great time to do it. New products and knowledge have made turf fertilization more environmentally friendly, cost-effective and efficient. □

STMA CHAPTER NEWS

Florida Chapter #1: The South Florida Research Station Field Day and Exposition will be held March 29th at the Institute of Food and Agricultural Science in Davie, Florida. Continuing education units will be issued.

The Florida Chapter will meet on May 21st at Joe Robbie Stadium. Meeting topics will include the field's Precision Athletic Turf (P.A.T.) system. A tour of the facility will be provided.

Further details on both events will be announced soon.

For more information on these events, the Florida Chapter, and other pending activities, contact: John Mascaro (305) 938-7477.

Southern California Chapter: Special thanks to the members of the Southern California Chapter for all their work on — and hospitality at — the National Sports Turf Managers Association Conference that was held in Anaheim, CA, on January 24-28, 1996. Thank you!

For information on the Southern California Chapter and upcoming activities, contact: Chris Bunnell at (619) 432-2421.

Midwest Chapter: The Midwest Chapter's Spring Seminar and annual Awards Banquet will be held March 6 in Schaumburg, IL. Budgets and Bidding will be the focus of the meeting. More details will be announced soon.

For more information on this meeting, the Midwest Chapter or other upcoming events, call: The Chapter Hotline (708) 439-4727.

Colorado Chapter: For information on the Colorado Chapter or upcoming events call the 24-Hour CCSTMA Hotline/FAX: (303) 438-9645 and leave a message, or contact: Ross Kurcab, Denver Broncos, at (303) 649-9000.

Iowa Chapter: For more information on the Iowa Chapter or upcoming activities contact: Lori at The Turf Office at (515) 232-8222 (phone) or (515) 232-8228 (fax).

Minnesota Chapter: For information on forming the Minnesota Chapter or for details on becoming a member, contact: Brian Deyak at (612) 255-7223.

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