Other Field Improvements Orchestrated by G. C. Trivett

Installing chain link fencing and weather-proof netting to provide a 20-foot tall backstop

Designing and installing an automatic sprinkler system

Sodding the infield with Tifway 419 bermudagrass

Designing and constructing a two story press box and concession stand (valued at $50,000) for $12,000 actual cost, due to donations of labor and materials

Arranging the donation and installation of a new scoreboard

Developing an innovative equipment acquisition program utilizing bargain used machines and joint purchase/use arrangements

Installing a new warning track topped with granite rock dust

Demolishing the old baseball dugouts and installing new ones

Courtesy of: STMA

From left to right: Steve Guise, 1999 STMA President; G.C. Trivett, 1999 Dick Ericson Award recipient; Ross Kurcab, 1998 Dick Ericson Award recipient.

years. I start with 1/4 pound per 1,000 square feet in late winter and early spring because I'm phasing out the overseeded perennial ryegrasses. I'll raise that to 1 pound from June through September, to support bermudagrass growth. During late August, I also apply."

"Traditionally, I've applied 600 pounds of 10-20-20 fertilizer in late August to prepare for the perennial ryegrass overseeding in mid-September. This provides color and a good playing surface for early spring activity. But following the input from some of the sessions at the January STMA Conference and my own observations, I'm debating that. As the perennial ryegrasses have become more aggressive and tougher to phase out, they've shaded and cooled the soil, slowing the green-up and root development of the bermudagrass base and weakening it. Our perennial ryegrasses may linger into mid-June or early July. Chemical elimination has shown only limited success. Though I appreciate the green spring turf, I'm considering going with dormant turf for spring of 2001 and monitoring the comparative bermudagrass reaction. We'll still have some color in the bermudagrass when football and soccer end in October."

G. C. Trivett was the 1999 recipient of the Dick Ericson Award, one of STMA's Founders Awards, the highest honors the association bestows upon their own. Fittingly, his nomination for the award came from the Granite Falls Middle School and ended noting these accomplishments: "His hard work and dedication, his enthusiasm for learning and his ability to implement and improve the awareness of turf management."

Bob Tracinski is the business communications manager for the John Deere Worldwide Commercial & Consumer Equipment Division headquartered in Raleigh, N.C. He serves as public relations co-chair for the national Sports Turf Managers Association.

Irrigation Design for Efficiency

by Robert Bodi

I often tell my students that we live in a round world, but we are required to design and install irrigation systems that are manufactured to water a square one. With this in mind, how can we expect to ever have an efficiently designed irrigation system?

There are two major elements in being able to obtain an efficient irrigation system: They are the design of the system and the actual installation of it. You cannot achieve an efficient system without both of these two elements done properly. A poor irrigation design will frustrate a good installer and will result in system problems for years to come. Hiring an unqualified installer will waste a good design. To prevent this from becoming a reality, we will investigate just what it takes to design for efficiency.

There are many decisions that have to be made before a proper design process can begin. Some of the key components of the system will need to be decided upon before starting.

Water Window for Irrigation

Your point of connection (POC) is where the system starts. It is imperative for it to be sized correctly before the project begins. This is one of the most important aspects of designing a system. The POC could be the pump that pulls the water out of a lake or well or could be the connection to the city water main. The water demand for your entire system will need to be known to size this component. Some things to consider in sizing these are the total areas needed to be irrigated. Will there be one field or a complex? Will you sprinkle just the fields or common areas such as around concession stands, playgrounds, between fields and even parking areas? If these decisions cannot be nailed down prior to the initial design process, it would be wise to size the POC slightly larger for future additions.

Your water window will need to be addressed to determine the size of the POC. The water window is considered to be the amount of time it takes to exhaust the water from the system onto the area where it is needed. In other words, let's say you have a complex with four fields that have heavy play on them. You need to be able to sprinkle them in six hours and can only water five nights a week because of maintenance and play time (5 nights x 6 hours a night = 30 hours per week water window). For an example, the POC is sized to handle only one 2-inch zone running at any given time. You need 1 1/2 inches of water per week on your turf. You have 20 large rotor zones that are 2-inch valves and can deliver 3/4 inches per hour precipitation rate (PR). Therefore you will have to run each zone for two hours per week to achieve a PR of 1 1/2 inches for the week. This will give you a water

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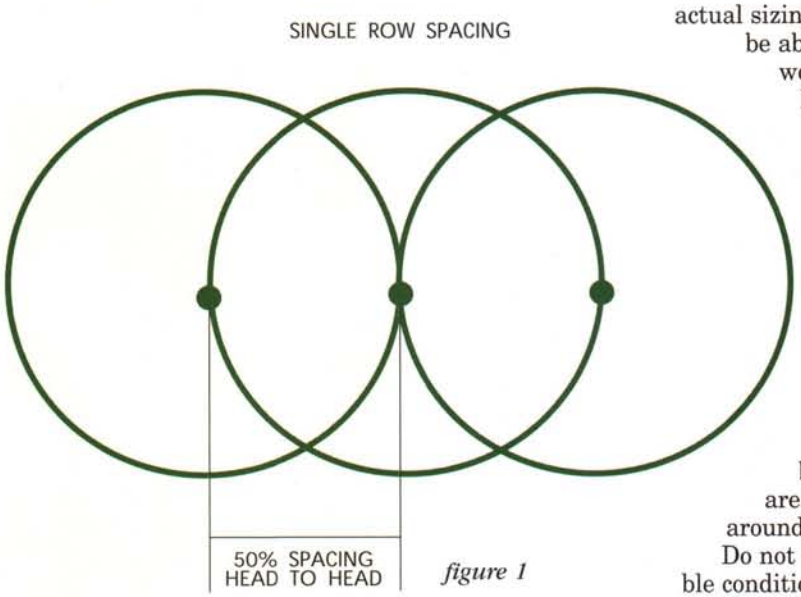

figure 1

window of 40 hours per week (20 zones x 2 hours run time per week). Remember that you can only run one zone individually at a time because of the size of the POC. So we have a problem: Our turf requires we run our system 40 hours per week, but we are only able to run 30 hours per week because of time limitations. What are our options? Hopefully we did our homework before the actual sizing of the POC and decided that we needed to be able to run two zones at a time. If so, then we would only have to size the POC and the main line to be able to handle the water demand within our water window.

The efficiency of the irrigation system is a factor to consider when sizing the POC and the main line. This will effect the run times greatly. The efficiency of a system will depend directly on such factors as wind, spacing of heads and psi of a system and its components. If a system has an efficiency rate of say 85 percent, then you would have to plan on watering approximately 15 percent longer to get the actual amount of water on the turf back to 100 percent of its needs. In most large area applications a good effciency rating will be around 70 to 80 percent.

Do not forget to size the system for the worst possible conditions. That is, design your system for the worst week of the year, with the highest ET rate for your area. If your system can keep up with that type of demand, then it will do what you will ask of it in the future.

Uniformity of Sprinkler Systems

An irrigation system with poor uniformity will be the main reason for wet and/or dry spots in the turf. One of the most important factors of good uniformity is sprinkler head placement. For good uniformity the industry stan-

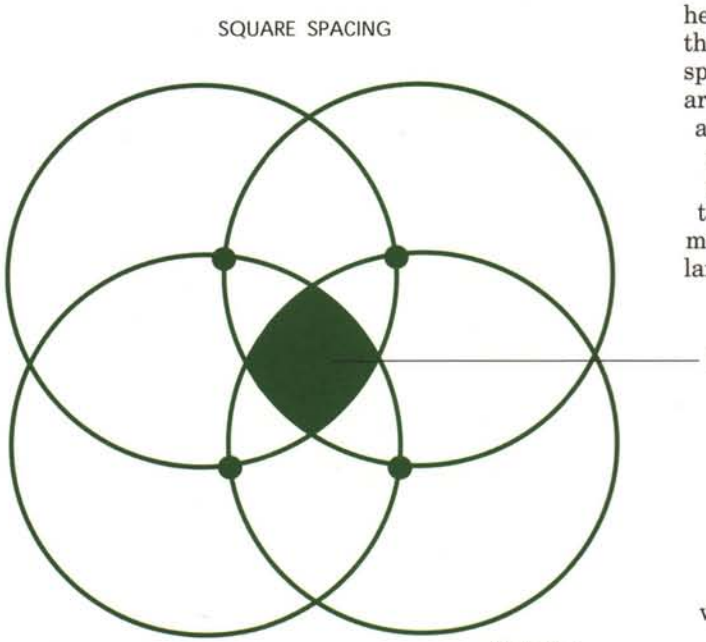

figure 2

dard is to place heads at 50 percent of their diameter. A common term for this is head-to-head coverage. On large turf applications such as golf and sports fields it is common to use 55 to 60 percent of the diameter. If you are irrigating an area with unusually high winds during the time of watering you should go to 50 percent of diameter or closer. Low angle nozzles are best for high wind situations also. They are less affected by the wind because of their low trajectory.

There are three types of spacing for heads: Single row, square and triangular spacing. Single row spacing provides the least uniformity, square offers higher uniformity, while triangular is the most effective.

In single row spacing (Figure 1) you will have a single row of heads in the center of the area to be covered. This is most common in golf applications. Single row spacing has poor uniformity and is not recommended.

The next type is square spacing (figure 2). This is where heads are placed in a square pattern grid on the area to be watered. The main problem with square spacing is that there is an area in the center of the square that does not get the same amount of water as the other areas.

The last type is triangular spacing (figure 3). It has the highest PR rate, best coverage and is easiest to manipulate the heads around irregular boundaries, such as infields, with the fewest effects on uniformity. The weak spot in square spacing is absent from triangular spacing. Typically you are required to use fewer heads in a large area with triangular spacing than with square spacing because of the efficiency of the watering grid. Therefore it is safe to say that the triangular system is the superior spacing technique to use for all of these reasons. There is a formula that is used for the placement of heads in a triangular system: Instead of spacing each row equally, use a multiplier of .866 for opposing rows. In other words, if you have a row of rotors spaced at 60 feet going from east to west, then the row spacing to the north will be .866 of 60 feet, or 52 feet.

Matched Precipitation Rates

The precipitation rate of a sprinkler system is a measure of the effective water that reaches the turf or area that you are trying to water. I have already mentioned that if you have poor spacing you will have uneven precipitation rates.

One other major factor in achieving good uniformity in your system is to match the heads to the area being covered to the other heads in that same area.

In any given area the water exhausted by irrigation heads must be matched to each other. In an area with heads that cover different amounts of ground, the heads or nozzles must be sized properly to deliver an amount of water that matches the other heads.

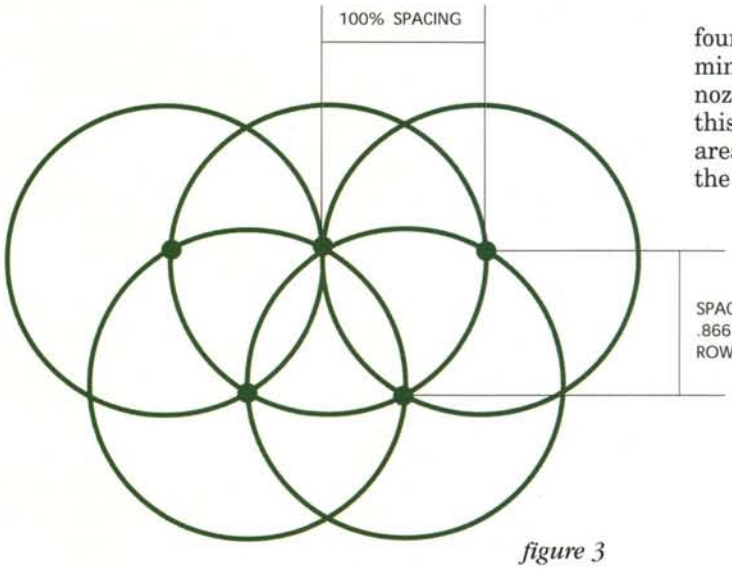

figure 3

TRIANGULAR SPACING

For example, let's say you have a zone with six heads each with a 60-foot radius. Four of them are 90-degree throws and two of them are 180-degree throws. The four heads have a nozzle that will deliver 10 gallons per minute. That would mean the two heads would need nozzles that deliver 20 gpm each. The principle behind this is that the 90-degree head is covering only half the area that the 180-degree head does. Therefore, if twice the area is being covered, then the head needs to deliver twice the water. This keeps the water distribution as equal as possible. Zones that do not have matched precipitation rates will not be able to perform properly.

We have looked at several of the main attributes needed to have an efficiently designed system. There is no doubt that your turf will suffer if any of these elements are not addressed when designing and installing your system.

Robert Bodi is certified through the Irrigation Association and teaches irrigation in a college degree program. He served on the STMA Certification Committee and was a member of the TNLA board for two years.

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Proper Installation of Sod for Repairs

by Dr. Tony Koski

It happens to all sports turf managers eventually—the need to repair a damaged field during the season. Mid-season sodding can be a quick and effective solution for repairing damaged turf, but many factors can affect the quality of the installation. The best repair jobs are unnoticed by the athletes using the field, because playability and safety should be of utmost importance to the sports turf manager. In a perfect world, sod repairs would blend in with the surrounding turf and would hardly be noticed from the stands.

Quality turf replacement involves planning, proper timing, careful site preparation, quality control during sod harvesting and installation and sensible post-installation care.

Anticipate the Need for Sod

The need for sod can come most unexpectedly. It is important to have not only an established plan for conducting repairs, but also a ready source of sod that is of sports turf quality. Sod that would otherwise be fine for a home lawn will perform poorly—and look bad—when installed into a sports turf situation. Imposing lower sports turf mowing heights will scalp sod intended for lawns, increasing the potential for poor transplant rooting and disease. Sod intended for lawns will not have the density of sports turf-ready sod because the higher mowing heights cause a turf to be less dense. Traction will not be ideal on sod intended for lawns—especially if it has been scalped down to a lower mowing height. Finally, the appearance of lawn-type sod will be unattractive for quite awhile after sports turf management practices have been used on it. Some ways to prepare for the inevitable, but often unpredictable, need for sod include:

- Maintain an updated contact list of sod producers within a few hours travel time of your facility that can provide sports turf quality sod at short notice; available species/varieties, sod types (thick-cut or conventional thickness, big roll or slab), soil types (compatible with your soil), transportation availability, and cost should all be documented.
- Develop a contractual relationship with a local grower who will routinely have a certain amount of sports turf quality sod in production, to include species or varieties similar to your own, maintained to your cultural specifications.
- Plant your own sod nursery and maintain it as you do your own playing fields.
- Identify sideline areas or other areas that could be used as an emergency sod source when a small amount of sod is needed for a quick, small-scale repair.
- Develop a resource list for extra labor, grading and installation equipment, trucking companies, root zone soil, etc. that must be mobilized at short notice to make a large replacement job go smoothly.
- Professional level turf managers generally recognize the need to have high quality sports turf sod available at short notice because of the obvious needs of professional sports teams should an emergency arise. Sports turf managers at all levels, however, should have a clear plan in place for sod replacement, including idenitified sources of good quality sod. When there is an annual need for sod replacement on certain fields, it only makes sense to contract with a local grower who can be a source for sports turf quality sod.

All in the Timing

The success or failure of a sod repair may depend on proper timing. When sod replacement is anticipated (goal mouth repair, for example), periods of field off-time should be identified or scheduled so as to allow sufficient time for proper installation. It is important that sod harvesting and installation not be so rushed that the final product is of poor quality. Even with thick-cut, big roll installations, some healing or grow-in time should be scheduled for the field if at all possible.

The amount of time required to perform sod repairs is best estimated by you. It comes down to previous experience, availability of sod, labor, and equipment resources, scheduling around other necessary activities and weather considerations. Of course, unplanned, emergency repairs will require you to call upon all available resources and for your labor crew to work long hours just to get the job done.

Site Preparation

The need for proper site preparation prior to sodding should be obvious. It is easier to correct grade problems before sodding than to attempt it after sod has been planted. High or low spots should be taken care of by grading or filling with root zone mix, in anticipation of sod cut to a specific depth, so that the installed product needs little rolling to attain a level field grade. Careful site preparation makes the rest of the installation process proceed more smoothly and helps ensure a good final product.

Quality Control Is Key

Superior sod installation involves quality control at two locations: where the sod is being harvested and where the sod is being planted. A key to quality control is communication. Frustration can occur when sod is not cut to the proper thickness or length, is not delivered at the right time or not enough (or too much) sod is delivered. While problems like these are often blamed on the sod producer, they generally won't occur if communications are clear and honest between the turf manager and the grower. One way to practice quality control at the sod farm—and to guarantee good communication—is to have someone from the turf manager's crew assigned to be at the sod farm when sod is being harvested. Sod quality factors