

# DESIGNING AN IRRIGATION SYSTEM FOR SPORTS TURF



by Bob Cloud, ASIC

Irrigation as a separate entity is unnecessary. The need for an irrigation system arises when the idea to landscape a project is conceived. The magnitude of this need depends upon many factors, including the location of the project, the time available for watering, the level of sophistication desired, and the degree of liability exposure acceptable.

In any event, some form of irrigation will be required to ensure the survival and growth of the horticultural investment. This requirement takes on other dimensions based on the particular project activities.

All sprinkler systems have a great deal



Bob Cloud

in common in that they require pipe and fittings, and various forms of water applicators. Depending on the frequency of use, the system must apply the water without interfering with the main purpose of the facility. This generally entails some form of automation (and other related devices) to facilitate watering at night. The primary differences in systems result from the function of the facility.

Sports turf is probably the most demanding of any type of development. Not only must the water requirement be satisfied, but this must be accomplished without hindering the sports activities.

*continued on page 18*



creating a hazard, or causing unacceptable conditions which interfere with the athletes peak performance. Recognizing these criteria is one thing, but meeting them is far more difficult.

Until recently, the choice of materials and equipment to assist in this endeavor were rather limited. Another limitation was the imagination required to conceive an alternative to the old conventional methods.

Before beginning the design, certain requirements must be established:

- Is uniformity of texture of primary importance?
- Is it unacceptable to apply water other than where needed, resulting in unplayable conditions?
- Has the issue of personal injury been addressed?
- Obstructions that are part of the irrigation system are not only potential hazards but can also affect the athlete's performance.

These important issues must be addressed and the problems solved throughout the design. Too often, the cost dictates the system. Instead, realistic criteria should be established, then the system should incorporate these requirements in the most economical way possible.

A vivid example of one solution is the use of artificial turf. In some respects, artificial turf eliminates many problems, but at an extremely high cost. It also does not afford the athlete a good playing surface. Living turf can be not only aesthetically equal, but will provide far more playable conditions. It is also safer than artificial turf, provided all the concerns are addressed and full advantage taken of the resources readily at hand.

We have to change the approach to creating, constructing, and maintaining facilities. Irrigation is a major consideration. Improperly handled, it can create unplayable conditions, be inefficient, and can be a hazard.

How should an irrigation system be designed for sports turf?

In general, athletic areas can be separated into two main categories; competition and non-competition. The difference in irrigation requirements between these two categories is determined by the degree of athletic expertise. These two main categories can be divided again into three sub-categories: general play areas (not strictly confined to one sport); track, field and football; and the baseball field. Each category has its own peculiarities and irrigation considerations.

The general play areas are, by far, the most simple to irrigate. Aside from possible modifications required for safety reasons, a conventional type irrigation system is usually appropriate.

The baseball field is basically composed of an outfield and an infield. The outfield is rather simple, since it is all turf. The infield however is a different matter. It usually consists of a skinned area, which involves the baselines from home plate to first and third base, and a much larger area between first and third base around second base. The square turfed center usually has concave half circles at each of the bases.



Irrigation consultant and superintendent together check coverage of sprinklers near green.

The turf areas need a great deal more water than the skinned area, which is generally only dampened to minimize dust and for tension control, so two entirely different requirements must be met. Conventional sprinklers may be used in the outfield, with the only special

### ***Sports turf is probably the most demanding of any type of development***

consideration being that the sprinkler heads be either rubber covered or of the type that recesses below the turf, with the smallest diameter top.

However, in order for a conventional system to thoroughly irrigate the infield, the skinned areas are often unplayable due to excessive water. In addition, the high level of activity in this area makes conventional heads hazardous. Therefore, new irrigation concepts are needed to truly address the infield requirements.

Two innovative systems are available to complement these demanding conditions, subterranean injected and microporous tubing. Both systems are installed at the lawn root zone, and emit water without spraying nor having any surface devices. Both systems are designed in a grid pattern, depending on the nature of the soil, from between 12 inches to approximately 24 inches on center. The primary difference between

the two systems is that the microporous tubing works on very low pressure and "sweats" or oozes the moisture, whereas the sub-injected system works at a higher pressure and utilizes orifices inserted into the tubing approximately 18 inches on center to relieve water at a higher rate. This makes the sub-injected tubing less prone to clogging.

Both systems depend greatly on soil capillary action for uniform application. The less the soil capillary action, the closer these grids must be spaced. Moisture sensing equipment will control the water application and maintain a precise level of tension.

The cost of these systems will vary, depending on the nature of the soil and the grid spacing, from approximately \$.80 to \$1.20 per square foot. In view of the increasing demand for good playing conditions and widespread concern regarding liability, either of these systems can be an economical solution.

The more all-purpose fields, involving track, football and soccer play, are somewhat similar but have other irrigation requirements as well.

In general, the oval track has facilities at each end for field and track. The area along either side is used for other games, concentrated around the outer edges of



## Irrigation System

the oval track. These areas are relatively narrow and involve irregular turf areas.

Non-turf areas should not be watered. If water is allowed to settle on the running tracks, it is difficult to dispose of and floods into the sand pits, causes discoloration, and creates other maintenance problems. To avoid such situations, the sprinkler system should not rely on the conventional large rotor heads which spray water everywhere.

The best approach is to divide all irregular areas, including approximately ten feet on either side of the oval playing field, and develop two different categories of area to be watered. For economy, the large area generally reserved for football or soccer would utilize a more conventional sprinkler, similar to that recommended for the baseball outfield. All other areas would use sub-injected or microporous systems, confining water to the lawn areas.

Although the initial installation cost on these systems is higher, this difference is soon recouped many times over. Not only will more playable conditions be assured but undue maintenance in other areas will be avoided.

Another consideration when utilizing these new types of systems is water conservation. Depending on the efficiency of

the previous operation, anywhere from thirty to sixty percent less water need be applied to properly grow the turf than with a conventional system. In view of the increasing cost of water, the savings can be significant, especially since sports facilities usually involve substantial acreage.

***It is best to select a  
sprinkler with the  
smallest possible  
diameter pop-up top  
that also recesses  
an inch below surface***

If a greater degree of refinement is desirable, such as when professional sports are involved, the larger areas can also be equipped with the sub-injected or microporous tubing systems to facilitate a more level field, conducive to optimum play and improved control of moisture and soil tension.

In areas where conventional sprinklers are used, special attention should be paid to the selection and placement of such equipment. All sprinkler heads not

located next to fences or other hard surfaces should be rubber covered. However, it is best to select a sprinkler head with the smallest possible diameter pop-up top, capable of recessing an inch or so below the surface of the turf.

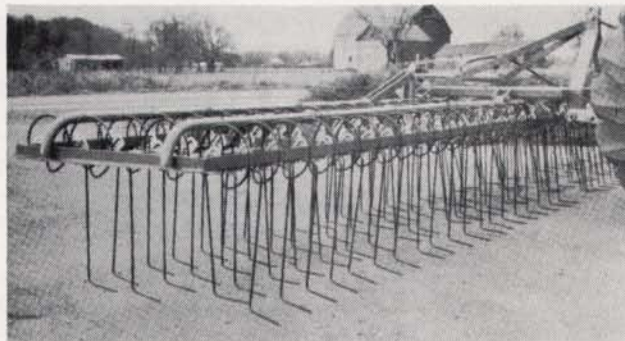
All control valves which require an access box for periodic adjustment or maintenance should be located outside the playing area whenever economically possible. If the additional expense involved to do this is unacceptable, a more economical solution is to locate the valve within the playing area, burying the box approximately six inches below finish grade. The box is then equipped with a rubber covered sleeve to identify the valve location and provide access to the throttling device.

I contend that through proper design and selection of equipment, and conscientious installation, operation and maintenance, the irrigation system can be an efficient tool. When unsatisfactory conditions are recognized, along with the threat of personal injury liability and the need to conserve water, the knowledge that there is a better solution leaves us no alternative but to address these concerns and use today's irrigation technology and advances.

Editor's Note: Bob Cloud is president of Associated Irrigation Consultants, Los Angeles, Calif. ►

## LELY THATCHER

Lely has manufactured the most accepted Turf Broadcaster for many years. Lely now offers the most ideal Fairway Thatching Implement on the market.



20' Model Shown

### Specifications

2- Models  
20' Thatcher  
10' Thatcher  
7' Transport-20'  
10' Transport-10'  
5 Position Tine Adj.  
Up to 12 MPH Working  
speed  
3 pt. Hitch  
Hydraulic Lift-20'

### Features

- Thatching grass
- Stands Grass up for better mowing
- Knocks down mounds of dirt
- Improves Fertilizer Penetration
- Ideal over seed after thatching
- 7' Transport on 20' Model (hydraulic)
- Removes Weeds
- Working speed up to 12 mph
- 5 position tine adjustment
- 3 pt. hitch

Please send me more information on the Thatcher.

☐ 10' Model

☐ 20' Model

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_