

5.1 Athletic Field Conservation

Applicability

This Best Management Practice is intended for all Municipal Water User Groups (“utilities”) which manage irrigated athletic field(s) and/or serve a customer with irrigated athletic field(s). An athletic field Best Management Practice addresses the efficiency concept that all desired management goals are accomplished with the minimum amount of water required.

Athletic fields often involve a visible use of water during the day, facing scrutiny by the public and water resource managers both because of large water demand to maintain an athletic field and the perception that the water use may be excessive. The specific measures listed as part of this Best Management Practice can be implemented individually or as a group. Once a utility decides to adopt this practice, the utility should follow it closely in order to achieve maximum water efficiency benefit.

Description

Athletic field conservation is an effective method of reducing system water demands as it results in the athletic field manager following a watering regimen that uses only the amount of water necessary to maintain the viability of the turf and the health of its users. Water is only applied to areas that are essential for use of the field.

Several opportunities for improved efficiency exist for athletic field management. The water savings obtained depends on how poor the water management practices were before initiating the Best Management Practice.

1. A standard athletic field maintenance regimen should be provided in written form to athletic field managers. This document should include:
 - a. Basic horticulture practices that maximize the health of the playing turf. Specifically, these should include: fertilization, aeration, mowing heights, weed control, and turf disease management.
 - b. Minimum requirements for maintenance of the irrigation system that supports the athletic field include: application of water in a uniform pattern, pressure, checking irrigation system for appropriate direction of spray, adjustment of nozzles when needed, prompt repair of leaks and malfunctioning heads, and the presence of a rain sensor tested for efficacy if the system has automatic controls.
 - c. A seasonal irrigation schedule for athletic fields that will support the field during normal weather conditions each month of the year.
 - d. Reasonable expectations of monthly water consumption for athletic fields during each season of the year based on a water budget calculation.
2. Athletic field maintenance workshops should be considered to assist managers in maintaining their fields. Workshops may be accomplished in cooperation with the

- AgriLife Extension Service or as part of a Texas Turf Association workshop. Full- to half-day workshops include topics such as:
- a. Basic horticultural practices for the unique challenges of athletic fields.
 - b. Recognizing problems common to athletic fields.
 - c. Suggested best practices for maintaining healthy turf to include weed control, fertilization, aeration, mowing heights, soil improvement and other options.
 - d. Instructions on trouble-shooting irrigation challenges such as adjustment of irrigation nozzles, recognizing irrigation components that must be replaced, and accomplishing changes in irrigation schedules to reflect seasonal variation of water need.
 - e. Instructions on how to adjust weekly and monthly applications of water based on locally available evapotranspiration data.
 - f. How to read the meter that services the irrigation of the athletic field so that the meter may be used to estimate monthly water bills and to identify changes in flow to the system.
3. Upgrades in irrigation technology should be considered if such improvements will result in lower water consumption. Some considerations of technology changes should include the following:
- a. Increased automation of irrigation may provide convenience to athletic field managers but may increase overall consumption. A system that must be turned on manually may be run less frequently than systems that are managed by an automatic controller.
 - b. Evapotranspiration-based controllers require strong knowledge of horticulture practices and an understanding of agronomy terminology that may be beyond the skill sets of athletic field managers. If complex devices are provided without extensive training, water usage could increase due to use of default settings or inappropriate assumptions in setting the controller.
 - c. Irrigation systems that have poor distribution uniformity may result in athletic field managers running the total system longer than is necessary to eliminate one dry spot. A licensed irrigator experienced in retrofits should be consulted to determine if there is a cost-effective fix for dry spots evident in irrigation systems.
4. Full irrigation audits may identify the extent to which water is wasted due to poor spray patterns and poor scheduling. Audits utilizing full catch technology and calculations of distribution uniformity can be completed by individuals with appropriate audit certification. Considerations of whether to invest in a full irrigation audit include:
- a. The aesthetic and playing condition requirements of the athletic field manager. If the field is one that is highly groomed with high expectations of uniform green, it may be worth the cost of the irrigation audit.
 - b. Willingness of the athletic field manager to make improvements to the irrigation system based on the results of an irrigation audit should also influence the decision to make the expense.

5. Proper irrigation scheduling is important for athletic field safety. Utilizing the irrigation audits, a turfgrass manager can properly monitor an athletic field evapotranspiration status. Adjusting the schedule to meet water needs will help ensure efficient irrigation to properly maintained athletic fields which can decrease the risk of athlete injury.

Implementation

1. Identify Stakeholders: Different organizations responsible for maintenance of athletic fields may include: school district staff, nonprofit athletic associations, private sports complex managers, and city staff. It is important to identify stakeholders and determine the best way to interact with them to achieve cooperation and long-term results whether irrigation of the athletic field is under the direction of someone trained in agronomy, a busy coach, or community volunteer.
2. Determine whether the approach of achieving conservation will be voluntary compliance or regulatory compliance.

If there have been no prior athletic field conservation initiatives, it may be best to begin with a voluntary approach. Athletic field managers may be motivated to cooperate in workshops that can assist them in maintaining high quality fields.

3. Development of ordinances requiring appropriate irrigation of athletic fields can be accomplished through a variety of related regulatory measures. These include:
 - a. Athletic fields may be required to submit annual irrigation efficiency checks completed by the athletic field manager or by a licensed irrigator to the appropriate city or utility staff.
 - b. Conservation plans may be required for each athletic field or athletic field facility to document how best practices are being followed to minimize the need for irrigation.
 - c. When individual meters are available to document monthly usage at athletic field sites, it is possible to determine if fields are using excess amounts of water. If sites appear to utilize an excessive amount of water when compared to a reasonable evapotranspiration-based water budget calculated for the area, they may be required to follow further measures.
 - d. Prohibition of water waste and mid-day irrigation may be used to require improved efficiency. This would make it unlawful to have water flow from an athletic field irrigation pool or be exhibited through broken or misdirected irrigation heads. Requiring irrigation to take place during early morning hours or evening hours may increase efficiency by eliminating some evaporative losses during peak heat and wind periods.
 - e. Excess use pricing may be directed at athletic fields that do not stay within reasonable consumption levels or that fail to comply with best practices such as submitting an annual maintenance checkup.

- f. Requirements for separate metering of irrigation water should be reviewed for the utility. If separate irrigation meters are not already required, a measure should be passed to require them for all future development. Installation of submeters for athletic fields should be considered where feasible.
 - g. A review of utility data should be completed to determine if it is possible to identify athletic fields from customer service records of consumption. If billing coding is not yet detailed enough to allow this, it should be considered. A review of customer service data is available through Best Management Practice: Customer Classifications.
4. The use of recycled or reclaimed water may be appropriate for athletic fields. If such a source is available, then its implementation should be considered. A review of recycled water programs is available through Best Management Practice: Recycled Water Retrofits.
 5. Athletic field owners may be willing to exchange their grass fields for artificial turf ones. Although this is an expensive investment, it yields savings in maintenance that are as important as water savings. A cost benefit analysis of this option can be completed for owners taking all current expenses and capital investment into account to determine return on investment.

Scope and Schedule

A 12-month implementation schedule may be followed. Steps that require ample time include:

1. Data review to identify the amount of water utilized by athletic fields. Athletic fields that do not have dedicated irrigation meters or are not coded in the utility customer service system could create difficulties.
2. Identifying and making contact with appropriate stakeholder groups that may include athletic associations, coach groups, school district facility management, and city staff.
3. Identifying and making contact with appropriate education partners such as AgriLife Extension, Texas Turf Association, the local irrigation association, or others.
4. Development of annual schedules for education opportunities for athletic field managers.
5. Development of a written document providing guidance on athletic field best management to be reviewed by representatives from as many stakeholder groups as possible as well as by education partners to improve buy-in and acceptance of measures.
6. Development of draft ordinance measures that may be phased in or adopted immediately after review by stakeholders and education partners.

Measuring Implementation and Determining Water Savings

Measurement of implementation can be accomplished by checking the steps for the Best Management Practice. Some additional goals that may be documented include:

1. Athletic field stakeholder contact list.

2. Schedule of education opportunities for athletic field managers.
3. Completion and distribution of Athletic Field Best Practices document.
4. Copy of conservation ordinances or rules enacted.
5. Copy of conservation plans submitted by athletic field managers.
6. Copy of irrigation check-up forms submitted by athletic field managers.
7. Records documenting enforcement of regulatory measures.
8. Changes in water consumption patterns based on meter reads available.
9. Decreases in public complaints about water waste at athletic fields.

The best documentation of water savings is to look at water use consumption at athletic fields before and after measures are adopted. It may be necessary to track actual consumption against expected consumption both before and after implementation. Expected consumption can be adjusted based on locally available evapotranspiration data in order to adjust for weather changes.

It may be necessary to utilize average savings achieved in other locations as a basis for estimating reductions in water if fields are not metered separately from other water uses. When similar measures are adopted, an assumption may be made that similar savings may be obtained.

Cost-Effectiveness Considerations

Improvements in irrigation practices are often very cost-effective to achieve. If water is being wasted by excessive application, then stopping the practice may yield significant savings in a short period of time at a low cost. Staff time to provide education and time spent on enforcement measures can be tracked to compare the cost against the water saved.

Changes to irrigation technology require greater investment, but yield significant savings. It is important to determine what the technology will change in order to actually reduce consumption. A rain sensor may prevent irrigation after rain events. A flow sensor may alert a manager to irrigation breaks so that repairs are timely. In contrast, if a site is run manually the addition of an automatic controller may save time but not water. An audit of an irrigation system may cost up to \$100-\$150 or more per zone. The funds for this will only be well spent if there is a strong intent to follow up on the conclusions of the audit report.

It is important to determine if the technology requires training to utilize correctly or requires human intervention to be effective. If the human investment is not available, technology will not solve the challenge of efficiency without it.

References for Additional Information

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3. Managing Healthy Sports Fields: A Guide to Using Organic Materials for Low-Maintenance and Chemical-Free Playing Fields, by Paul D. Sachs, John Wiley & Sons, January 2004.
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5. Irrigation System Design and Management Courses, Irrigation Technology Center, Texas A&M. <http://irrigation.tamu.edu/courses.php>
6. Water Management Stretches Irrigation Water, E. K. Chandler. <http://www.txplant-soillab.com/page32.htm>

Acknowledgements

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