



MISSISSIPPI STATE UNIVERSITY

AgriLIFE EXTENSION  
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DIVISION OF AGRICULTURE RESEARCH & EXTENSION  
University of Arkansas System

## Tips for Conserving Irrigation Water in the Southern Region

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*These irrigation management tips are designed to promote applying the water needed by the crop uniformly and efficiently while minimizing surface runoff. Combine these tips with local crop agronomic practices, including crop mix, planting dates that seek to avoid hot and dry weather, seeding rates, fertilizer rates, weed control and so forth, for a systematic approach to water conservation.*

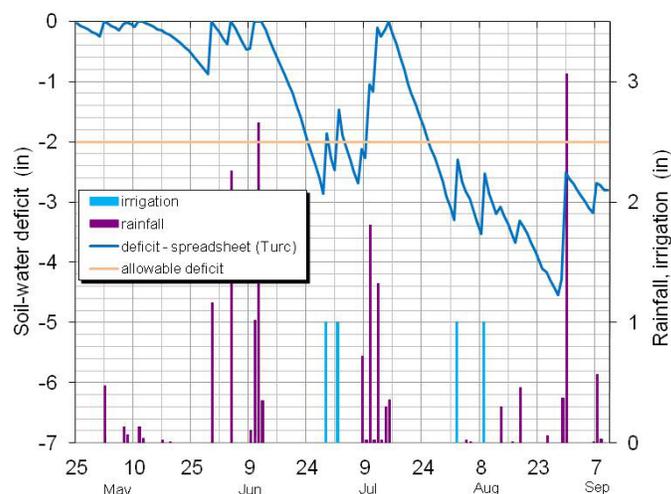
### Management

**Measure the flow.** Install a flow meter or use a portable flow meter to obtain measurements of the flow rate and total flow. Use these measurements to design your irrigation sets, calculate water applied and schedule your irrigation.

**Use an ET-based system to schedule irrigation.** An effective method for deciding when and how much water to apply is essential. Evapotranspiration, or ET-based scheduling is a checkbook method that balances evapotranspiration from the plant with rain and irrigation. There are a variety of ET-based scheduling methods, including atmometers, weather stations and computer programs. Select one that works for you.

**Use soil moisture sensors to schedule irrigation or evaluate irrigation management.** Soil moisture sensors can provide information about soil moisture trends and whether too much or not enough water is being applied. Soil moisture sensors can help validate where you are with your evapotranspiration scheduling.

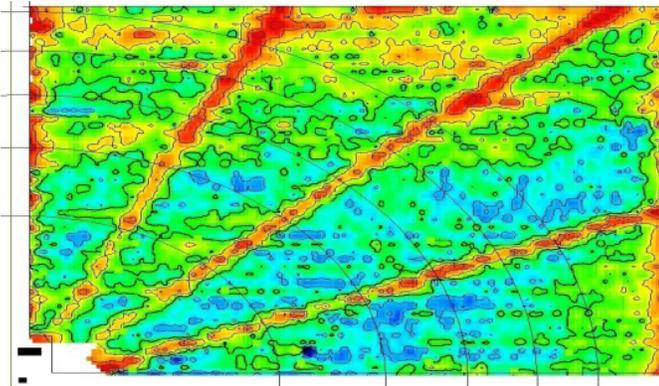
ET-based scheduling chart



**Irrigate on time and at the right times.** Proper initiation and termination of irrigation saves water and can improve yields. The best opportunities to save water are at the beginning and at the end of the season. Using the soil water left in the profile to finish the crop can reduce the need for the last irrigation. Water applied late in the season may not be used by the crop and is wasted. If you are not sure when to initiate or terminate irrigation for all the crops you grow, find out from your Extension Service agent.

**Evaluate your irrigation management after each season with checks such as yield monitor data or aerial imagery.** Evaluating your irrigation results at the end of the season is critical if you want to improve your irrigation management.

Yield map showing water stress



Yield monitor data and aerial imagery can help you find problems with your irrigation system and management method that you can't spot from the ground.

**Improve irrigation management by using timers or pump monitors to shut wells off at appropriate times.**

Timers can be installed and set to turn wells off. This can help to reduce runoff, especially at times when it is not convenient for the manager to be there. In addition, pump monitors generally allow for remote operation and monitoring of pumps through the Internet and cellular connections.

Irrigation pump monitor



## Design and Operation

**Maintain grades and ensure good field drainage.** Remove potholes and slack-water areas from fields, touch up graded fields, as necessary, and get excess water from rainfall events off the field within 24 hours.

**Address compaction and soil-related factors.** Soil compaction reduces the infiltration of rainfall and irrigation water, increasing runoff and decreasing soil moisture available for crop growth. Organic matter increases the water-holding capacity of soils. A comprehensive irrigation efficiency program includes adoption of practices that address plant/water/soil factors that improve the water storage potential of soils. Several options exist to improve infiltration, including furrow-diking, deep tillage, no-till and cover crops. Experiment to find the solutions that work best on your farm.

Cover Crop



## Tips for Furrow Irrigation

**Improve irrigation efficiency of furrow irrigation by using computerized hole-selection.** Computerized hole-selection software such as PHAUCET (available from USDA NRCS) or Pipe Planner (available from Delta Plastics, Inc.) computes flow and pressures in lay-flat tubing for even distribution of water from the punched holes, even for varying row

*Computerized hole selection*



lengths. Down-row uniformity means rows are watered evenly, reducing tail water and conserving water and energy.

**Improve irrigation efficiency by using a surge valve in conjunction with computerized hole-selection.** Surge flow intermittently applies water to irrigation furrows. Conventional furrow irrigation sets apply water continuously while surge flow intermittently applies water to the irrigation furrows. Surge irrigation can improve irrigation application efficiency up to 50 percent compared to conventional systems.

*Surge valve controller*



*Surge valve applying water to two sets*



**Design irrigation sets appropriately for your soils, fields and pump capacities.** Increasing the flow per furrow (reducing set size) or reducing the length of the furrow will get the water to the end of the furrow quicker, improving down-row uniformity.

**Improve irrigation efficiency of furrow irrigation by irrigating alternate rows on cracking clay soils in conjunction with computerized hole-selection.** The irrigation water will move across rows through the cracks as well as down the row, reducing variability and reducing runoff at the end of the field, with good management.

*Applying water to alternate middles*



**Install a tail-water recovery system to increase irrigation efficiency.** Capture the runoff water from irrigation and reuse it.

## Tips for Sprinkler Systems

Sprinkler nozzles older than seven years should be checked annually. **Nozzles can be checked for uniformity using catch cans, rain gauges or irrigages** <http://www.ksre.ksu.edu/bookstore/pubs/MF2552.pdf>. Some types of nozzles may wear out faster, especially if the irrigation water source contains sand. One of the most cost-effective ways to improve a pivot or sprinkler system is to update or upgrade the sprinkler package. <http://www.ksre.ksu.edu/bookstore/pubs/L908.pdf>

## Tips for Rice Irrigation

**For rice irrigation, improve water savings by going to zero-grade or using multiple inlet irrigation in contour- and precision-graded fields.** Zero-grade uses about two-thirds of the water compared to levee systems, and multiple-inlet systems reduce water use by approximately 20 percent for contour- and precision-level fields. Combine these with the use of rice flood depth gauges to further improve flood management, allowing for increased rainfall capture and reduced over-pumping.

### Related links:

#### Multiple-inlet Rice Irrigation:

<http://msucares.com/pubs/publications/p2338.pdf>

<http://www.youtube.com/watch?v=XR2JNspMXkk>

#### Rice Flood Depth Gauge:

[http://msucares.com/pubs/infosheets\\_research/i1358.pdf](http://msucares.com/pubs/infosheets_research/i1358.pdf)

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Pub. 3241-K (200) 8/13

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