

University of Arkansas Division of Agriculture Cooperative Extension Service

Irrigation User's Guide

The Irrigation Program helps determine irrigation timing. The software should not be used as the sole irrigation scheduling method without a dependable backup system such as sound judgment based on practical experience. Certain conditions at a particular site may significantly decrease the accuracy of this software.

The software user periodically enters daily maximum temperature, rainfall and irrigation data to generate a predicted irrigation schedule. The software performs calculations and uses microclimate parameters to suggest irrigation needs throughout the growing season for cotton, soybean, corn and milo crops that are irrigated with flood, furrow, border or pivot systems. The program uses a water balance approach that attempts to keep crops from experiencing stress due to a lack of available moisture.

GENERAL SOFTWARE OPERATION The program is primarily menu driven. This document is a description of the main program parts and the available options.

IRRIGATION MAIN MENU

SOME DEFINITIONS The program uses a soil moisture deficit approach for scheduling irrigation. Soil moisture deficit is an indicator of the relative dryness or wetness of the soil in inches of water. It is also a measure of inches of water used from the soil by a particular crop. You will be asked to enter a date and the starting or initial moisture deficit on this date, for each field, from recommendations in the program. The program will calculate daily water use from the temperature, rainfall and irrigation data that you enter, beginning on the next day. You will also enter an allowable soil moisture deficit for each field from guidelines in the program. This will determine how much water the crop is allowed to use before irrigation is recommended. The date and deficit values can be changed during the season if necessary.

WHEN TO START THE PROGRAM It is best to start near planting of your earliest crop or at least at emergence. As discussed above, the starting date involves the estimate of the soil moisture deficit in the field(s) on this date and also requires that you be prepared to record maximum daily temperature, rainfall and irrigation data from this date. You don't have to start entering the data into the program immediately, but it needs to be recorded somewhere.

PROGRAM ASSUMPTIONS The following assumptions do not significantly limit the accuracy of the program but are necessary for the program to be both practical and effective for on-farm use.

- 1) Maximum daily temperature is a relatively accurate predictor of daily water use by crops grown in the humid, midsouth climate.
- 2) Measurement of maximum temperature in each field is not required because maximum temperature data for the general area is adequate.
- 3) Program users will not consistently let a fields' allowable deficit be exceeded by more than 50% before it receives irrigation.

- 4) Fields have good surface drainage - after 24 hrs. following an irrigation or rainfall, there is limited standing water on the field.
- 5) Irrigation with flood, furrow and border systems brings the soil moisture deficit back to zero (0).
- 6) Ninety percent (90%) of the irrigation amount applied by a center pivot is effective in reducing the soil moisture deficit.
- 7) Rain is measured at each field and the amount entered is effective in reducing the soil moisture deficit.
- 8) Program users will have some method for determining when to stop irrigating their crops - the program does not give irrigation termination recommendations.

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Participant enrollment and login:

New users to the Irrigation program must enroll by selecting the link New User? Enroll Now to enroll in the program before entering any data. The name and log-in name needs to be that of the consultant or the individual producer.

County Extension agents and consultants select the correct radio button. Individual producers select Other. By selecting County agents or consultants, the program has the option to change the producer name when creating an irrigation file.

Information required includes name, e-mail address, and password of your choice. (Passwords must be at least eight (8) characters long, may contain numbers (0-9) and upper and lowercase letters (A-Z, a-z), but no spaces, and are case sensitive.) In the event that a password is forgotten, it will be sent to the participant's e-mail address (which must be entered into the log-in box) by selecting the link for Forgot your Password? e-mail me my password.

Getting Started

Overview

1. Create an Irrigation File.
2. Create a Temperature File.

For first time users, it is HIGHLY RECOMMENDED to select Wizard- Create file from the main menu. All of the above steps can be done by selecting Advanced- Create/update file or by selecting Wizard- Create file . Everything selected in the Wizard can be changed by going to Advanced- Create/update file.

3. Either enter the Temperatures or have the temperatures pulled from the weatherfile.

4. Enter the Irrigation and or rain amounts.

5. Projection will create a report based on the information from the previous steps. This can create either a report or a summary report.

Reports:

Temperatures/ rain- update

A user can create an irrigation and a temperature file. All of the basic information is entered here. This includes, acres, crop, emergence date, rain amount, irrigation amount, and etc. In this section, one can change almost everything that was created from the "Wizard- Create file". This option allows you to enter the necessary daily information for the irrigation file; maximum temperature, rainfall amounts and irrigation applications. This data doesn't have to be entered each day but it needs to be collected so it can be entered on at least a weekly basis.

Projection

Selecting this link will create either a single or a summary report. In this section, one can select either last 10 days or all of the days. Also one can enter an estimated temperature for the next 10 days. This web page shows the last date of the temperature file. This option is usually selected after updating the daily data for an irrigation file. This option projects the irrigation needs for different fields in the next 10 days by using the predicted high temperatures and assuming no rainfall in the 10-day period. The projection can be for only one irrigation file or it can be a summary of all of the irrigation files.

Delete Existing File Data for New Season

This link should be used at the beginning of the year to delete the previous years' weather data from files that will be used again in the current year. This can reduce the amount of information that has to be entered for fields that are used each year. This DELETES all of their temperatures, rain, and irrigation amounts. Field names, acres, etc will still be in the file.

Row Crop Chart

This link lets you produce a daily water use chart for different crops. This is not used in the irrigation scheduling program but it is included as a quick reference for how much water is used by different crops during the growing season.

Wizard- Create file

This link is HIGHLY RECOMMENDED for first time users. The page has a help section beside each field. This page can ONLY be used to create files. After creating an irrigation and a temperature file, select Advanced- Create/update file to edit the files.

Frequently Asked Questions:

Question: I selected to view a report via the .PDF file, and a blank screen appeared, but no data. What is wrong?

Answer: You probably had too many other applications running when trying to load the Adobe Acrobat Reader. Close some applications and try again.

Question: I selected to view a report via the .PDF file and nothing appeared. What is wrong?

Answer: The popup blocker in your browser may hide the report. Turn off pop up blocker.

Question: In previous years, I've had to manually download the Daily Weather File before starting irrigation. Where is that option this year?

Answer: Since the irrigation has been upgraded to a web-based application, the weather information is automatically updated and incorporated into the program for you. On the irrigation Log-in page, the program still displays the last day of update for the weather so you can be assured the weather is up-to-date.

Question: Since the program is now on the Internet, does this mean that only producers with Internet access and an e-mail address will be able to participate?

Answer: No, the program is still available to everyone, regardless of their ability to access the Web. Options are available so that the county agent can enter the producer information, print out the producer report, and mail it to the producer just as in previous years.

Disclaimer

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