CIRRIG User Notes

CIRRIG provides daily irrigation run times for each irrigation zone established by the user under the user's account. CIRRIG runs each day at a user-selected time polling weather data from the past 24-hours. Output can be viewed on the website, can be automatically downloaded as a *.csv file, or can be automatically implemented with PLC technology developed by UF.

Automation

Automatic control of irrigation provides the best opportunity to utilize CIRRIG to implement ET-based irrigation. Irrigation output from CIRRIG changes daily or more frequently if multiple daily irrigation cycles are scheduled. Manually changing run times on a frequent basis would be very labor intensive. UF developed a programmable logic controller (PLC) system that can automatically acquire CIRRIG output run times to set timer values for controlling solenoid valves in the field. For nurseries with other computer-controlled irrigation system, a UF-developed program can automatically download CIRRIG output which then could be implemented by the computer-controlled irrigation system with additional programming. Such a system is currently being successfully used at a Virginia container nursery. See CIRRIG Automation or contact Jeff Million or Tom Yeager for further information on automation options.

2 Zone Types

1) **ET** – Irrigation based on estimating daily ET from plant production conditions.

ET Zone inputs plant size, percent plant cover, container size, container spacing, irrigation capturing ability

How it works Container ET is estimated based on plant inputs and weather using functions developed through UF research. The amount of irrigation water required to resupply ET water loss is based on irrigation rate and the estimated capture factor (CF) – see CIRRIG Concepts.

2) **LF** – Irrigation based on routine LF testing

LF Zone inputs LF date/time, LF run time, LF, Target LF

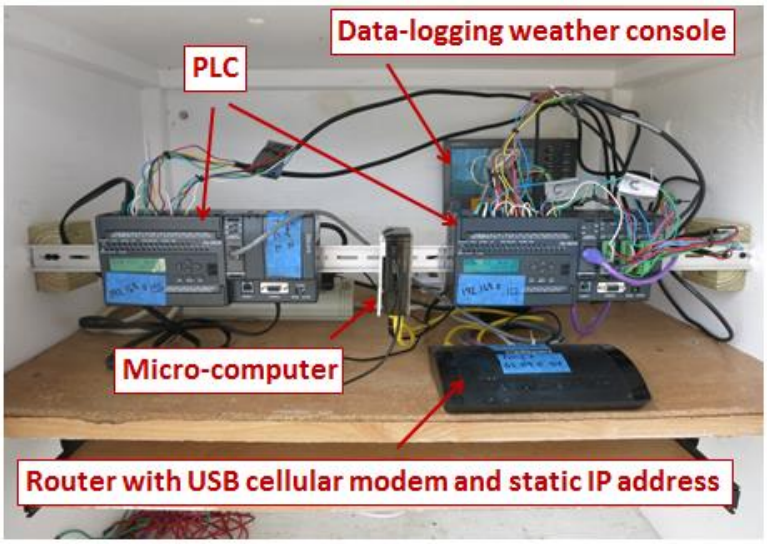
How it works Based on LF test inputs, CIRRIG determines an adjusted run time that would provide the target LF value for the day of the LF test. Each day thereafter, CIRRIG compares the past 24-hr ET rate with the 24-hr ET associated with the LF test and increases or decreases the irrigation run time accordingly.

Weather Station

A weather station situated on-site is needed to use CIRRIG. A suitable station is the Vantage Pro2 Plus (Davis Instruments, Hayward, CA) which has a solar radiation sensor and a fan-aspirated radiation shield for accurate temperature readings. The weather station has a data-logging console which is housed within communication distance of the weather station

(wireless or hard-wired). A micro-computer (Raspberry Pi 3; Adafruits Industries, NY, NY) connected to the internet via a static IP address acquires and uploads weather data data to the CIRRIG server where it is stored under the user's account. The microcomputer computer is also used to control and monitor PLCs for automatic irrigation control.

Davis Vantage Pro2 Plus weather station with a hardwired connection to a Davis data-logging console housed in the green cabinet at Hibernia Nursery in Webster, FL. Weather data is uploaded to the CIRRIG server in Gainesville via a Raspberry Pi 3 microcomputer connected to the internet via a USB cellular modem.



Example setup for automatic irrigation control using CIRRIG at a container nursery. A microcomputer uploads weather data from the Davis data-logging weather console to CIRRIG server in Gainesville and also serves to acquire CIRRIG output for controlling irrigation valves in the field using programmable logic controllers (PLC).

CIRRIG Pages

Home

Displays daily output for all zones in the account. ET and LF zone types are displayed separately because supportive information is different for the two types. The weather data displayed is based upon the first zone and might not be applicable to the other zones.

Zone Calculator

Use this page to rerun zones at different times of the day (different weather) or you can rerun after editing the weather data as you like.

Manage My Zones

Use this page to display all zones, create zones, edit individual zones, and access individual zone histories. The Global Zone Settings allows the user to edit some parameters for all zones at once. For routine zone input changes, use the "**Download My Zones to CSV**" and "**Upload CSV to My Zones**" function. After downloading the current 'myZones.csv' file, make edits with a spreadsheet program and then upload new amended file to update the zone inputs.

> Note 1. In Excel, the date format of the CSV file needs to be changed before uploading. To do this right click mouse on a cell with the date and choose format cells>custom then in the "Type: " box enter YYYY-MM-DD HH:MM:SS and then "OK". You can then past the format to other cells as needed.
>
> Before reformatting date:
> lfTestDate
> 8/16/2018 16:30
> 8/16/2018 16:30
>
> Aftern reformatting date:
> lfTestDate
> 2018-08-16 16:30:00
> 2018-08-16 16:30:00

After saving the file after, upload changes with 'Upload CSV to My Zones" function.

Zone Inputs

Click the zone number on the home page or click <edit> on the Manage My Zones page to edit individual zones or use the "**Download My Zones to CSV**" and "**Upload CSV to My Zones**" function to edit multiple zones with spreadsheet.

Irrigation inputs:

Zone Type

Choose ET or LF (See CIRRIG concepts)

External reference
Value that can be output in a *.csv file for automatic irrigation or other applications
Irrigation schedule
For schedules which skip days, the deficit carryover is output on the home page
Number of cycles
Divides the irrigation run time output for the day into the number of cycles designated. Note: If using UF's PLC technology, multiple cycles are calculated in real-time whereas CIRRIG calculations are done once a day at a specified time.

Fixed inputs:

Production area
If under shade or plastic, enter the % light exclusion. If under plastic, rain is excluded.
Irrigation capture ability
ForET zone, the irrigation water capturing ability that best describes the plant species should be selected; to be conservative, select "nil" if unsure.

Infrequently changing inputs:

These are inputs that are monitored during production and input as conditions change. Inputs are plant-related for ET zone type and LF test-related for LF zone type. See "**More Info**" for information related to these inputs.

Zone History page

Displays the history of a selected zone. Access zone history by clicking <history> in Manage My Zones page.

My Weather Stations page

View a list of all weather stations in the account or create a new one. Access hourly or daily weather history by clicking <view>