WATERIGHT
ONLINE IRRIGATION
SCHEDULING

Developed by:
Center for Irrigation Technology
Fresno State
About WATERIGHT

- The WATERIGHT - developed by the CIT with support from the US Bureau of Reclamation and the CA-DWR (1997).
- WATERIGHT is designed to be a multi-function, educational resource for irrigation water management.
- References over 60 crops grown in California

www.wateright.org
What is WATERIGHT?

- Irrigation Scheduling Tool
- Educational Tool
WATERIGHT

- IMPORTANT NOTE!!
  - Data used to produce the schedule is less than 24 hours old (near real time)
  - The irrigation schedules produced by WATERIGHT are only *estimates* of plant / water requirements. Some of the calculations are based on long-term, average weather patterns and average crop coefficient curves.
  - Field verification by the user is absolutely necessary to ensure proper soil moisture levels and plant health throughout a growing season.
WATERIGHT

- 3 options

- Agriculture
- Commercial Turf
- Home Owner
WATERIGHT

- **Agricultural Users:**
  - Farmers and users whom want to do irrigation scheduling but know nothing about the subject.
  - Farmers whom know about scheduling and want to use WATERIGHT as a tool for more efficient watering schedules.
CIMIS

- 230 Stations Across California
CIMIS - Stations

1. Weather data (collected by weather stations) are automatically transmitted to a central computer located in Sacramento.

2. The weather data is analyzed and stored in a database server.

3. Weather data is made available over the Internet.
Water use estimates

- **Example:**
  - If, $ETo = 0.25$ inches/day
  - and, $Kc = 0.55$ (for an orange tree in July)
  - then, $ETc = ETo \times Kc = 0.25$ inches/day $\times 0.55 = 0.1375$ or $0.14$ inches/day

- *Red is from CIMIS*
- *Yellow is from Wateright*
Typical water use demand

Typical Curve - Annual Crop
Typical water use demand

Typical Curve – Permanent Crop
Irrigation Efficiency

- **What is irrigation efficiency?**
  - Irrigation efficiency (IE) is a measure of how much applied water is used beneficially. A general equation for irrigation efficiency would be:

  \[
  IE = \frac{\text{Beneficial Use of Applied Water}}{\text{Total Applied Water}}
  \]
Too much water & nitrates
Proper irrigation scheduling

Verification of water depth can be done using Soil Moisture Sensors
Soil Moisture Sensor Placement
Before Using WATERIGHT

- Know Your Soil Type
- Know Your Irrigation System
- Know Your Crop
- Know Your Water
Agriculture

- A new screen will appear that looks like this.

Detailed Instructions:

5. Select the soil type from the drop-down list.
6. Select the irrigation system from the drop-down list and then click the 'System parameters' button.
7. Then click one of the action buttons above.
Agriculture

- Select “Choose Station”.

![Agricultural Irrigation Scheduling](image)
Select your CIMIS station

- Selected Station 80 (located on the Fresno State campus farm)
Agriculture

- Back to the initial entry screen. Click
- “Set Time/Irrigation Set”.
- Enter 18 for hours.
Agriculture

- Click on “Choose Crop”.

![Image of crop selection interface]
Agriculture

- It will take you to a new screen
- On Crop Name drop down menu select “Almond”
- Default Settings will appear
Agriculture

- You should now be back on the home entry page.
- Go down to “Choose Soil >>>” click on the drop down and select a soil type.

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### Agricultural Irrigation Scheduling

**Field Data Summary**

| Field Name: | CIMIS Station - 80  
|            | City - Fresno  
|            | County - Fresno |

**Choose Station**

- Scheduling Basis and Criteria (choose one):
  - Management Allowed Depletion: 50%
  - Est. Time/Irrigation Est: 18 hrs
  - Set Days in Rotation: days

**Crop - Almonds**

- Start: 3/1
- End: 10/15
- Stop Irrigating: 10/15
- Rootzone: 5 feet
- Etc Adjust: 100%

**Choose Crop**

- Avail H2O (in/ft) - Soil
  - .45 - Coarse Sand/Gravel
  - .80 - Sand
  - 1.05 - Loamy Sand
  - 1.60 - Sandy Loam
  - 1.95 - Fine Sandy Loam
  - 2.40 - Loams/Silt Loams
  - 2.10 - Clay Loams
  - 1.90 - Silty Clays/Clays

**Choose System**

**System Parameters**

- 5. Select the soil type from:
- 6. Select the irrigation system parameters' button

**Detailed Instructions:**

Step 1: Enter a Field Name.
Agriculture

• Next by “Choose System>>” click on the drop down menu and select an irrigation system type.

Detailed Instructions:
Step 1: Enter a Field Name.
Agriculture

• It will take you to the following screen below.

• Enter a percentage for “System Emission Uniformity”, “Flow Rate”, Tree Spacing, diameter of spray”. 

![Agricultural Irrigation Scheduling](image_url)
Agriculture

• Once all the required information has been entered and selected click “Schedule This Field”.

• The Info You have entered will be saved onto Cookies
Agricultural Irrigation Scheduling

- Agricultural Irrigation Scheduling

Seasonal Irrigation Schedule

IMPORTANT:

- Please refer to the notes at the bottom of this page for information on how the schedule was calculated.
- Users ABSOLUTELY need to verify the plant health and soil moisture in their fields.
- This is an AVERAGE SEASONAL schedule and should be used as INITIAL GUIDANCE ONLY.

The Irrigation Schedule starts just below the Field Data Summary.

Field Data Summary

| CINIS Stn: | Fresno State #80 |
| City of Fresno in Fresno County |

Field Number 1
Description North Field
Crop Almonds
Crop Season 3/1 - 10/15
Stop Irrigating 10/15
Soil Coarse Sand/Gravel
Maximum Root Zone (ft) 9
Irrigation System Microsprinkler
Irrigation Efficiency 85%
Gross Application Rate (in/hr) 0.012
Scheduling Basis Hours/Irrigation Set
Desired Hours per Set (hrs) 18
Gross Applied per Set (in) 0.218765192027224

Seasonal Irrigation Schedule

<table>
<thead>
<tr>
<th>For Week Ending</th>
<th>Average Year FTn</th>
<th>Average Year Rain</th>
<th>This Year FTn</th>
<th>This Year Rain</th>
<th>Averages for Season FTn</th>
<th>Averages for Season Rain</th>
<th>Change This Yr vs Avg Yr</th>
<th>Total ETc to Date</th>
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<td>In/Day In/Wk</td>
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</table>
# Agriculture

## Field Data Summary

| CIMIS Stn: | Fresno State #80  
City of Fresno in Fresno County |
|-----------:|------------------------------------------------|
| Field Number | 1 |
| Description | North Field |
| Crop | Almonds |
| Crop Season | 3/1 - 10/15 |
| Stop Irrigating | 10/15 |
| Soil | Coarse Sand/Gravel |
| Maximum RootZone (ft) | 5 |
| Irrigation System | Microsprinkler |
| Irrigation Efficiency | 85% |
| Gross Application Rate (in/hr) | 0.012 |
| Scheduling Basis | Hours/Irrigation Set |
| Desired Hours per Set (hrs) | 18 |
| Gross Applied per Set (in) | 0.218765192027224 |
## Seasonal Irrigation Schedule

<table>
<thead>
<tr>
<th>For Week Ending</th>
<th>Average Year ETo</th>
<th>This Year ETo</th>
<th>Averages for Week Root RunTime Zone</th>
<th>Change This Yr %</th>
<th>Total ETo</th>
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<td>In/Day In/Wk</td>
<td>In/Dy Ft HH:mm</td>
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</tr>
</tbody>
</table>
Benefits of Irrigation Management

- Why is irrigation scheduling important?
  - Improved water and energy use
  - Water Use Efficiency (WUE) – More Crop Per Drop
  - Irrigation management is a crucial key to utilize fertilizer effectively on farmlands.
  - Protect ground water quality
  - Sustainable water supply
Summary of WATERIGHT

- Education Tool
- Helps with water budgeting
- Know “How Much” and “When”
- Promotes Flow Meters and Moisture Sensors as a valuable tool
- Best Management Practice
  - Avoid deep percolation and over irrigation
  - Manage water in the Root Zone
Questions

www.wateright.org