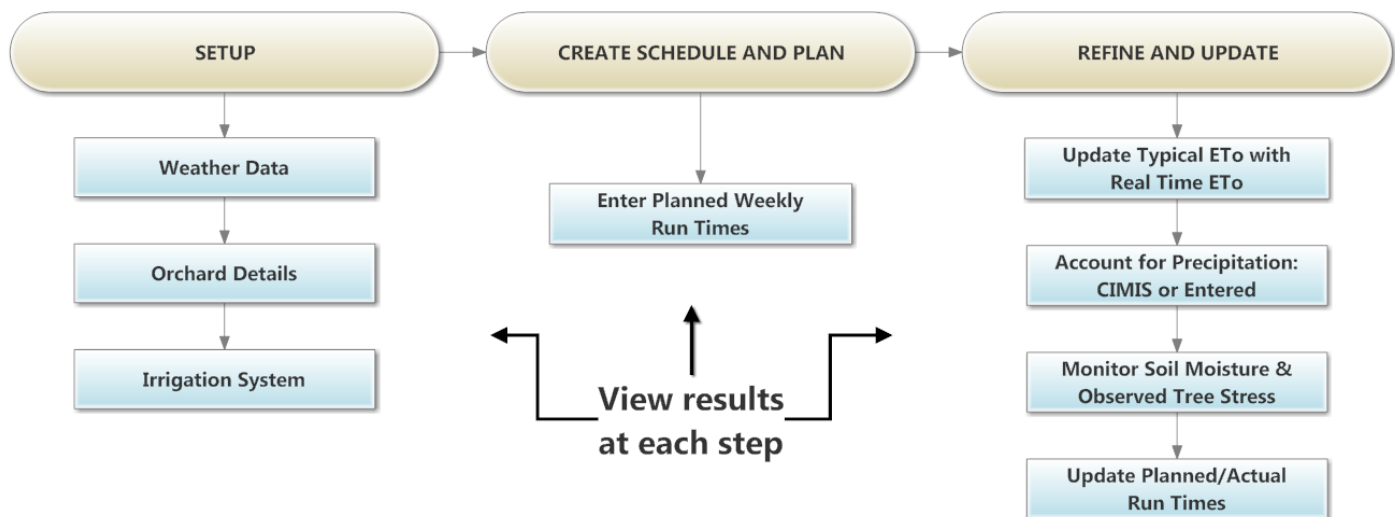


## Getting Started with the CASP Irrigation Calculator



Using the Irrigation Calculator to schedule irrigation involves one-time set up, making a plan, and refining the plan.

### ▪ SETUP

- **Weather:** Select a CIMIS station and ETo data source (by station or using spatial lat. and long.)
- **Basic Orchard:** Enter year planted, orchard spacing, maturity status and midday canopy coverage.
- **Advanced Orchard:** Enter effective rooting depth, soil texture by depth, irrigation system subsurface wetted volume and available soil moisture (ASM) alert. The advanced settings are used to determine the amount of water held by the soil.
- **Irrigation System:** Enter your pressurized irrigation system parameters; type (drip, microsprinklers or rotator sprinklers), the typical run time, and system configuration, flow rate, and distribution uniformity.
- See the [Almond Irrigation Improvement Continuum](#) for additional guidance.

### ▪ MAKE A PLAN USING HISTORIC (TYPICAL) ETo FOR YOUR REGION

- Plan weekly run times using CIMIS Evapotranspiration (ETo) and Crop Evapotranspiration (ETc) data.

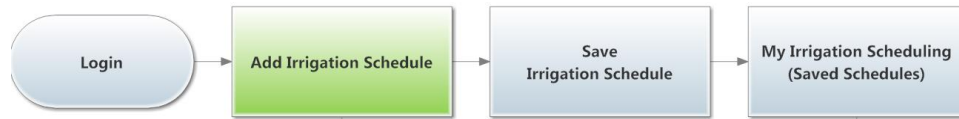
### ▪ REFINE AND UPDATE

- Real-Time CIMIS data automatically replaces the regional typical data
- At-a-glance highlighting shows Available Soil Moisture (ASM) alerts and longer-than-typical run times
- View reports to see Seasonal Irrigation Summary with accumulated water supplied and accumulated ETc.
- View or download week-by-week details of ETo, ETc, irrigations and soil status
- Update precipitation with your measured rainfall (CIMIS override)
- Update planned and actual weekly run times throughout the season

## Key Points about the CASP Irrigation Calculator

- Local conditions and variations impact irrigation (e.g., microclimates, soil variation, irrigation system parameters and field history) and many factors should be considered. The CASP Irrigation Calculator cannot account for all local conditions, use your best judgment.
- This calculator is based on CIMIS ETo, data and models by UC farm advisors for mature almond orchards without salinity, infiltration, or other special considerations.
- Kc values are from UC ANR Publication 8515 <http://anrcatalog.ucanr.edu/pdf/8515.pdf>
- More information about irrigation management can be found in the [Almond Irrigation Improvement Continuum](#).

## Adding an Irrigation Schedule



Click **Irrigation Calculator** from the Home Page, I WANT TO... or from the Tools menu dropdown, from PROGRESS SUMMARY → Irrigation Calculator → **View Details** or from PICK UP WHERE I LEFT OFF... The Assessments also has one-click navigation to the Calculator.

SWITCH TO ALMONDS.COM | CONSUMERS | FOOD PROFESSIONALS | HEALTH PROFESSIONALS | ALMOND GROWERS | ALMOND PROCESSORS | NEWSROOM | GRO

Home Assessments Tools Orchards/Facilities Events Help

N Calculator  
Irrigation Calculator

HOME

Take A Tour

Welcome back Ricardo, your last visit was today.

### I WANT TO...

- Assess Modules
- Use Nitrogen Tool
- Use Irrigation Tool**
- Add/Edit Orchards
- View Map
- View Reports
- Get Help

### PICK UP WHERE I LEFT OFF... MOST RECENT ACTIVITY

Activity	Date	View
Assessments	(10/04/2018) - AA MyT Fine Almonds > AA MyT Fine Almonds > Block 1	<a href="#">View</a>
N Calculator	(05/03/2018) - AA MyT Fine Almonds > AA MyT Fine Almonds > Block 3	<a href="#">View</a>
Irrigation Calculator	(05/03/2018) - AA MyT Fine Almonds > AA MyT Fine Almonds > Block	<a href="#">View</a>

### NEWS

The new assessment season has begun!  
As of November 1st, you can assess the 2018 season.

### PROGRESS SUMMARY

Category	2016/2017 Progress	Completion Status	View Details
Assessments	33%	1 out of 3 complete	<a href="#">View Details</a>
N Calculator	100%	3 out of 3 complete	<a href="#">View Details</a>
Irrigation Calculator	33%	1 out of 3 complete	<a href="#">View Details</a>
Achieved Continuum	67%	2 out of 3 complete	<a href="#">View Details</a>

**3** Orchards      **160** Acres  
[View Details](#)

Schedule an orchard by clicking **Add Irrigation Schedule**.

IRRIGATION CALCULATOR

Take A Tour

IRRIGATION SCHEDULE SUMMARY

Filter your list

Add Irrigation Schedule

Crop Year	Organization	Enterprise	Orchard	
2016	ABC Orchards	A1 Acme Nuts	A1 Home Ranch #1	Edit Clone PDF
2016	ABC Orchards	A1 Acme Nuts	A3 Back 40	Edit Clone PDF

Click **Filter your List** to manage the list of saved schedules by Year, Organization, Enterprise and Orchard.

**Edit, Clone** or print a summary **PDF** of previously saved schedules from the summary list.

IRRIGATION CALCULATOR

Take A Tour

IRRIGATION SCHEDULE

Select the orchard for which you want to create a schedule. Click the "Create Schedule" button.

1 Crop Year: 2016

< Select Crop Year

2 Organization: ABC Orchards  
Enterprise: A1 Acme Nuts  
Orchard: A3 Back 40

Create Schedule >

Confirm orchard and click **Create Schedule** or change the year by clicking **Select Crop Year**.

Alternatively, from the **Assessments** page, click **Go To Irrigation Schedule** to create new schedule or open an existing one for the current calendar year.

ASSESSMENTS

Year: 2016/2017

Organizations

- AA | Demo Business
  - AA | Demo DBA
    - Block 1 (10.00)
    - Block 2 (10.00)

PRACTICES

Name: Block 1  
Type: Orchard  
Organization: AA | Demo Business  
Enterprise: AA | Demo DBA

e-Module View: Comprehensive

Go to Assessment Comparison Report

Go to Irrigation Schedule

Go to Nitrogen Budget

All valid questions answered | Some questions answered | No questions answered

Irrigation Management | Nutrient and Soil Management | Air Quality

## Irrigation Calculator Navigation Overview and SETUP details

The screenshot shows the 'IRRIGATION CALCULATOR' interface. At the top, there's a 'Take A Tour' button. Below that is the 'IRRIGATION CALCULATION WORK FLOW' section with 'Go to Assessment' and 'Learn More +' buttons. The main navigation bar includes 'Crop Year: 2017', 'Orchard: Block 1', 'Organization: AA MyT Fine Almonds', and 'Business: AA MyT Fine Almonds'. A vertical 'SAVE' button is on the right. Below the navigation bar are three tabs: 'SETUP', 'WEEKLY INPUTS', and 'REPORTS'. Under the 'SETUP' tab, there are 'Save', 'Refresh', 'Close', and 'Delete' buttons. The 'SETUP' section is divided into 'WEATHER SETUP' and other sections. The 'WEATHER SETUP' section includes a checkbox for 'Use Station associated with Zip:', an input for 'Orchard ZIP code: 93657', a 'Confirm' button, a dropdown for 'CIMIS Station: Parlier (39)', a map for 'Map location for Spatial CIMIS', and input fields for 'Latitude: 36.748720' and 'Longitude: -119.460967'.

Overview Tour

Workflow

To Assessment

Year & Orchard

Entry Tabs

Controls

Data Entry

Scroll down as needed.

The Setup tab has four sections. Weather, Basic Orchard, Advanced Orchard and Irrigation Setup. Gathering this data ahead of time will streamline setup.

### WEATHER SETUP

Use Station associated with Zip:

\* Orchard ZIP code:

\* CIMIS Station:

\* Map location for Spatial CIMIS

When evapotranspiration (ET<sub>o</sub>) data is not available, the historic average is used.

\* Latitude:

\* Longitude:

### BASIC ORCHARD SETUP

Year Orchard Planted:

Acres:

\* Row Spacing:  (feet)

\* Tree Spacing:  (feet)

Mature Orchard

\* Orchard Canopy Cover at Midday:  %

### ADVANCED ORCHARD SETUP

Responses to items below are optional and do not change Run Hrs to Meet ETC. Available Soil Moisture (ASM) columns.

Effective Rooting Depth (feet):

Soil Texture by Depth:

	Start Depth (feet)	End Depth (feet)	Soil Texture
<input type="checkbox"/>	Surface	4	Fine - Loams, silt loams, sandy clays, silty clays, clays (2.4)

### IRRIGATION SETUP

Week to start accumulating ETC:

Irrigation System Notes:

Number of Sets:

Typical Run Time (hours):

\* System Type:

\* Emitters/Microsprinklers per Tree:

\* Average Gallons per Hour (GPH) Rate per Emitter/Microsprinkler:  gph

\* Distribution Uniformity:  %

\* denotes required for calculations

## Irrigation Weekly Tab Details

Go to Assessment

Expand/collapse Workflow

**IRRIGATION CALCULATION WORK FLOW**

Go to Assessment Learn More --

**SETUP** → **CREATE SCHEDULE AND PLAN** → **REFINE AND UPDATE**

Weather Data  
Orchard Details  
Irrigation System

Enter Planned Weekly Run Times

Update Typical ETo with Real Time ETo  
Account for Precipitation: CIMIS or Entered  
Monitor Soil Moisture & Observed Tree Stress  
Update Planned/Actual Run Times

View results at each step

Crop Year: 2016 Orchard: Block 1 Organization: AA | Demo Business Business: AA | Demo DBA

SETUP WEEKLY INPUTS REPORTS

Save Refresh Close Delete

Pick a month to refocus week-grid

View Help Icon content

Enter or update weekly values for:  
Run Time  
Soil Moisture  
Rainfall  
Tree Status

Week	Run time (hours)	Run to Meet ETC		Run to Fill ASM		Calculated % ASM Depleted	Measured Soil Moisture	Measured Rainfall (Inches) * CIMIS value	Observed Tree Status
		Hours	Inches	Hours	Inches				
MAR (#10) 3/6 - 3/12		5.2	0.23	0.0	-0.56	0%		* 1.71	
MAR (#11) 3/13 - 3/19		12.0	0.53	9.1	0.41	17%		* 0.66	
MAR (#12) 3/20 - 3/26		13.4	0.60	22.5	1.00	42%	0	* 0.26	
MAR (#13) 3/27 - 4/2		20.3	0.90	20.3	0.90	38%		* 0.01	
APR (#14) 4/3 - 4/9	12	22.8	1.02	31.1	1.39	58%		* 0.20	
APR (#15) 4/10 - 4/16	12	22.1	0.98	41.2	1.83	76%		* 0.10	

This recommendation is not intended to be used as the sole source of information for making irrigation decisions. Local environmental conditions can have a profound effect on irrigation demands. The Almond Board of California, the University of California, and the California State University are not responsible for the accuracy of this model.

Click **Refresh** or **Save** to update all calculations. Depending on your internet connection, this may take time to automatically update weather information from CIMIS.

- Click on orange hover text icons (?) to learn more
- The buttons **Save**, **Close** and **Delete** prompt for a confirmation dialog box.
- Remember to click **Save** frequently, **unsaved changes are lost**.
- Enter details or view results by tab: **SETUP**, **WEEKLY INPUTS** and **REPORTS**

## Irrigation REPORTS Tab Details

Three reports are available on the **REPORTS** tab.

Crop Year: 2017   Orchard: Block 1   Organization: AA | Demo Business   Business: AA | Demo DBA

SETUP
WEEKLY INPUTS
REPORTS

Save
Refresh
Close
Delete

**REPORTS** ?

### SEASONAL IRRIGATION SUMMARY

Crop Evapotranspiration (ETc) and Supplied Water graph by week. Bars show weekly values; lines show accumulated values.

Download Chart (PDF)

■ Weekly ETc (in.)
 ■ Weekly Inches Supplied
 — Accum ETc (in.)
 — Accum Inches Supplied

#### DETAILED

A comprehensive report showing weekly values for reference evapotranspiration (ETo), crop coefficients (Kc) and crop evapotranspiration ETc with accumulated ETc, CIMIS precipitation, entered and effective precipitation along with run hours and inches required to meet ETc, run hours and inches required to fill Available Soil Moisture (ASM), ASM depletion and observed tree status by week. Click [Show Details \(PDF\)](#) to create formatted printable report, click [Download Details \(CSV File\)](#) to download a file compatible Excel.

Show Details (PDF)
Download Details (CSV File)

#### SUMMARY

An overview report showing entered run hours along with run hours and inches to meet ETc, Run Hours to fill ASM, and ASM depletion by week.

Click [Show Details \(PDF\)](#) to create formatted printable report, click [Download Details \(CSV File\)](#) to download a file compatible Excel.

Show Summary (PDF)
Download Summary (CSV File)

### SEASONAL IRRIGATION SUMMARY

Crop Evapotranspiration (ETc) and Supplied Water graph by week. Bars show weekly values; lines show accumulated values. View onscreen or export as a PDF.

SAVE

**DETAILED Report** displays the entered data, some intermediary calculations and a weekly grid for the irrigation schedule (orchard and year).

Irrigation Schedule Details										Orchard/Org/Business: A3 Back 40 Schedule Year: 2016							
Week	Typical ETo (in.)	This Yr ETo (in.)	Kc	ETc (in.)	Accum ETc (in.)	CIMIS Precip (in.)	Entered Precip (in.)	Effective Precip (in.)	Run Hrs to Meet ETc	Entered Run Hrs	Inches Supplied	Run Hrs to Fill ASM	Inches to Fill ASM	Calc % ASM Depleted	Entered % ASM Depleted	Obs Tree Stress	
1/3 - 1/9	0.28	0.25	0.4	0.1		0.81		0.25	1.5		0.25		-0.15	0			
1/10 - 1/16	0.28	0.32	0.4	0.13		0.03			1.9			1.9	0.13	6			
1/17 - 1/23	0.28	0.29	0.4	0.12		0.28			1.7			3.7	0.24	12			
1/24 - 1/30	0.28	0.38	0.4	0.15					2.3			5.9	0.4	19			
<i>and so on for each week...</i>																	
12/11 - 12/17	0.28		0.43	0.12	50.31				1.8			32.4	2.16	100			
12/18 - 12/24	0.28		0.43	0.12	50.43				1.8			32.4	2.16	100			
12/25 - 12/31	0.28		0.43	0.12	50.55				1.8			32.4	2.16	100			
<b>TOTALS</b>										<b>144</b>	<b>12</b>						

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Schedule Details Header	Description
Typical ETo (in.)	ETo based on historical average for CIMIS region
This Yr ETo (in.)	ETo based on CIMIS station or spatial CIMIS
Kc	The co-factor for mature almonds that adjusts ETo almonds ETc
ETc (in.)	The expected or calculated losses to ETc based on ETo, Kc, and Krt (the factor that adjusts for canopy coverage)
Accum ETc (in.)	Accumulated ETc based on the value for the weeks since the user entered value "Week to start accumulating ET"
CIMIS Precip (in.)	Precipitation for the week at the selected CIMIS station
Entered Precip (in.)	Override of CIMIS precipitation data
Effective Precip (in.)	CIMIS precipitation is adjusted downward by the following formula: <i>When (CIMIS Precip) &gt; 0.5 then (CIMIS Precip - 0.5)*0.80 otherwise 0</i> Entered precipitation is not adjusted.
Run Hrs to Meet ETc	Calculation based on ETo and Kc, for the week, orchard canopy factor (Krt) and the irrigation system hourly supply rate adjusted for Distribution Uniformity (DU)
Entered Run Hrs	Entered Run Hours
Inches Supplied	Effective precipitation plus raw irrigation supply (unadjusted for Distribution Uniformity).
Run Hrs to Fill ASM	Run hours to fill Available Soil Moisture (ASM), Calculation based ASM from the previous week, irrigation applied, effective rainfall and losses to ETc for the week.
Inches to Fill ASM	Inches to fill Available Soil Moisture (ASM). Calculation based ASM from the previous week, irrigation applied, effective rainfall and losses to ETc for the week.
Calc % ASM Depleted:	Calculated percent ASM Depleted= $ASM_{[week's\ end]} / ASM_{[Total]}$ ASM <sub>[week's end]</sub> accounts for run hours, previous week's ASM, precipitation and ETc.
Entered % ASM Depleted:	User entered override of the calculated depleted ASM
Obs Tree Stress	User entered observed tree moisture stress: select from Minimal, Mild, Moderate, or Severe

Show Summary (PDF) displays the entered data and onscreen results for the schedule (orchard and year).

Irrigation Schedule		Calculations					
<b>Criteria</b>		<b>Week</b>	<b>Entered Run Hours</b>	<b>Run Hrs to Meet ETc</b>	<b>Run Hrs to Fill ASM</b>	<b>Calc % ASM Depleted</b>	<b>Entered % ASM Depleted</b>
Year	2016	1/3 - 1/9		1.4		0%	
Organization	ABC Orchards	1/10 - 1/16		2.1	2.1	7%	
Enterprise	A1 Acme Nuts	1/17 - 1/23		1.7	3.8	13%	
Orchard	A3 Back 40	1/24 - 1/30		2.3	6.1	21%	
<b>Weather Setup</b>		1/31 - 2/6		2.8	1.3	4%	
Orchard ZIP Code	93216	2/7 - 2/13		4.3	5.6	19%	
CIMIS Station	Delano	2/14 - 2/20		3.9	9.4	32%	
Source for current year ETo data	CIMIS Station	2/21 - 2/27		4.9	14.4	48%	
<b>Orchard Setup</b>		2/28 - 3/5		7	21.3	72%	
Year Orchard Planted	2000	3/6 - 3/12		6.1	27.5	93%	
Planted Acres	25	3/13 - 3/19	0	8.7	36.2	100%	0%
Row / Tree Spacing	15 x 15 feet	3/20 - 3/26	7.3	5.5		0%	
Soil Texture	Medium - Very fine sandy loams, loams, silt loams, sandy clays (1.6)	3/27 - 4/2		17.6	17.6	56%	
Soil Notes		4/3 - 4/9		17.6	35.1	100%	
Effective Rooting Depth (feet)	3	4/10 - 4/16		17.6	47.3	100%	
Orchard Maturity	Mature	4/17 - 4/23		17.6	47.3	100%	
Available Soil Moisture (ASM) Depletion Alert (%)	50	4/24 - 4/30		17.6	47.3	100%	
<b>Irrigation Setup</b>		5/1 - 5/7		26.1	55.8	100%	
Week to Start Accumulating ETc	3/6 - 3/12	5/8 - 5/14		26.1	55.8	100%	
Number of Sets	3	5/15 - 5/21		26.1	55.8	100%	
Typical Run Time Hours	20	5/22 - 5/28		26.1	55.8	100%	
Irrigation System Notes		5/29 - 6/4		32.8	62.5	100%	
System Type	Drip	6/5 - 6/11		32.8	62.5	100%	
Emitters/Microsprinklers per Tree	2	6/12 - 6/18		32.8	62.5	100%	
Average Emission Rate per Emitter/Microsprinkler	5	6/19 - 6/25		32.8	62.5	100%	
Subsurface Wetted Area (%)	75	6/26 - 7/2		35.9	65.6	100%	
Distribution Uniformity (%)	85	7/3 - 7/9		35.9	65.6	100%	
		7/10 - 7/16		35.9	65.6	100%	
		7/17 - 7/23		35.9	65.6	100%	
		7/24 - 7/30		35.9	65.6	100%	
		7/31 - 8/6		32.1	61.8	100%	
		8/7 - 8/13		32.1	61.8	100%	
		8/14 - 8/20		32.1	61.8	100%	
		8/21 - 8/27		32.1	61.8	100%	
		8/28 - 9/3		23.3	53	100%	
		9/4 - 9/10		23.3	53	100%	
		9/11 - 9/17		23.3	53	100%	
		9/18 - 9/24		23.3	53	100%	
		9/25 - 10/1		13.8	43.5	100%	
		10/2 - 10/8		13.8	43.5	100%	
		10/9 - 10/15		13.8	43.5	100%	
		10/16 - 10/22		13.8	43.5	100%	
		10/23 - 10/29		13.8	43.5	100%	
		10/30 - 11/5		5.6	35.3	100%	
		11/6 - 11/12		5.6	35.3	100%	
		11/13 - 11/19		5.6	35.3	100%	
		11/20 - 11/26		5.6	35.3	100%	
		11/27 - 12/3		2	31.7	100%	
		12/4 - 12/10		2	31.7	100%	
		12/11 - 12/17		2	31.7	100%	
		12/18 - 12/24		2	31.7	100%	
		12/25 - 12/31		2	31.7	100%	

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## Cloning Schedules

### IRRIGATION CALCULATOR

Take A Tour

#### IRRIGATION SCHEDULE SUMMARY

Filter your list

Add Irrigation Schedule

Crop Year	Organization	Enterprise	Orchard	
2016	ABC Orchards	A1 Acme Nuts	A1 Home Ranch #1	Edit Clone PDF
2016	ABC Orchards	A1 Acme Nuts	A3 Back 40	Edit Clone PDF

Click **Clone** to copy a schedule from one year to another year or from one orchard to another orchard.

### IRRIGATION CALCULATOR

#### SOURCE

Crop Year: 2016  
Organization: ABC Orchards  
Enterprise: A1 Acme Nuts  
Orchard: A3 Back 40

#### TARGET

Crop Year: 2016 ▾  
Organization: ABC Orchards  
Enterprise: A1 Acme Nuts  
Orchard: A1 Home Ranch #1 ▾

CLONE

The **SOURCE** is on the left. Details for the **TARGET** are on the right.

Fully specify the target details:

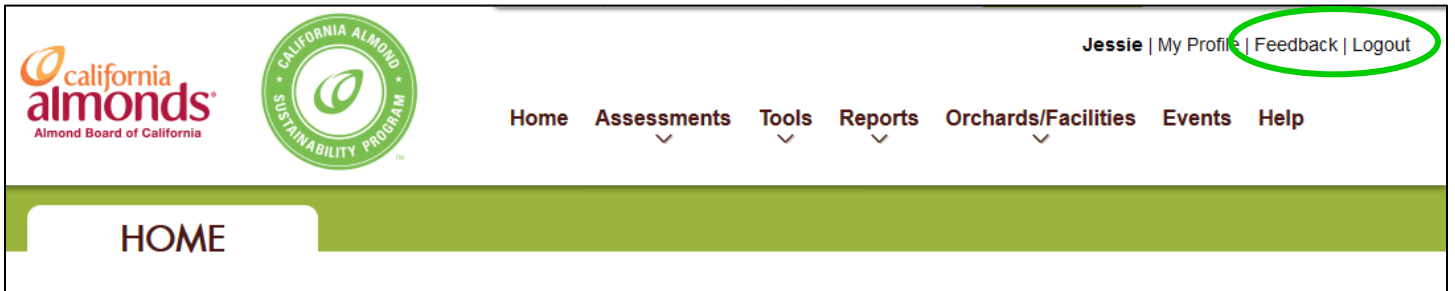
- **Crop Year**
- **Organization** (Pre-populated if only one)
- **Enterprise** (Pre-populated if only one)
- **Orchard**

Clicking **CLONE** prompts confirmation and then opens the cloned schedule in the editor. Click **Save** to save the cloned model.

## Provide Feedback and Logout

To send a message to the CASP team, click **Feedback**.

To logout, click **Logout**.



california almonds  
Almond Board of California

CALIFORNIA ALMOND  
SUSTAINABILITY PROGRAM

Jessie | My Profile | Feedback | Logout

Home Assessments Tools Reports Orchards/Facilities Events Help

HOME

Additional questions?

Contact [CASP@SureHarvest.com](mailto:CASP@SureHarvest.com)

CASP Support 831-477-7797