



2017

# THE ALMOND CONFERENCE

THE CALIFORNIA ALMOND SUSTAINABILITY PROGRAM (CASP) AND  
IRRIGATION IMPROVEMENT CONTINUUM – WHY IT'S RELEVANT TO YOU!

Room 308-309 | December 6 2017



# CEUs – New Process

## Certified Crop Advisor (CCA)

- Sign in and out of each session you attend.
- Pickup verification sheet at conclusion of each session.
- *Repeat this process for each session, and each day you wish to receive credits*

## Pest Control Advisor (PCA), Qualified Applicator (QA), Private Applicator (PA)

- Pickup scantron at the start of the day at first session you attend; complete form.
- Sign in and out of each session you attend.
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- Turn in your scantron at the end of the day at the last session you attend.

*Sign in sheets and verification sheets are located at the back of each session room.*

# AGENDA

- **Gabriele Ludwig**, Almond Board of California, moderator
- **Spencer Cooper**, Almond Board of California
- **Mel Machado**, Blue Diamond Growers
- **Julie Adams**, Almond Board of California





# HOW CASP CAN HELP YOU TELL *YOUR* STORY!

Spencer Cooper, Almond Board of California



# CALIFORNIA ALMOND SUSTAINABILITY PROGRAM IN THE FIELD

*“Sustainable almond farming utilizes production practices that are economically viable and are based upon scientific research, common sense and a respect for the environment, neighbors and employees.”*



# CASP EVOLUTION TIMELINE: 2005- 2017 YTD



**ABC BOD Adopts  
Definition of  
Sustainability**



**1st Two Best  
Practices  
Assessment  
Modules**



**Launch of  
Online CASP  
Assessment  
Platform**



**1st Almond  
Sustainability  
Report**



**Launch of Online  
N Budget &  
Regulatory  
Reporting Tools**

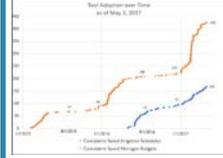


**Launch of  
Online  
Irrigation  
Calculator**

**New  
Bee  
Health &  
Pollination Module**



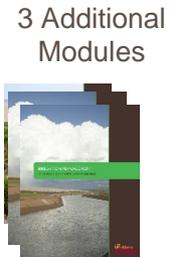
**AIM Irrigation  
Continuum  
E-Module &  
Report**



**Software Use  
and Reporting  
Enhancements**

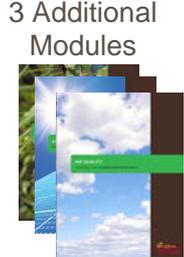


**2005**  
Sustainability  
Program Needs  
Assessment,  
Positioning and  
Strategy



**2009**  
3 Additional  
Modules

**2012**  
1st Statistical  
Analysis of  
Aggregate  
Data



**2014**  
3 Additional  
Modules

**2015**  
Updated &  
Streamlined  
Modules



**2016**  
Mobile  
Optimized  
Online  
Experience

**2017**  
2nd Statistical  
Analysis of  
Aggregate  
Data



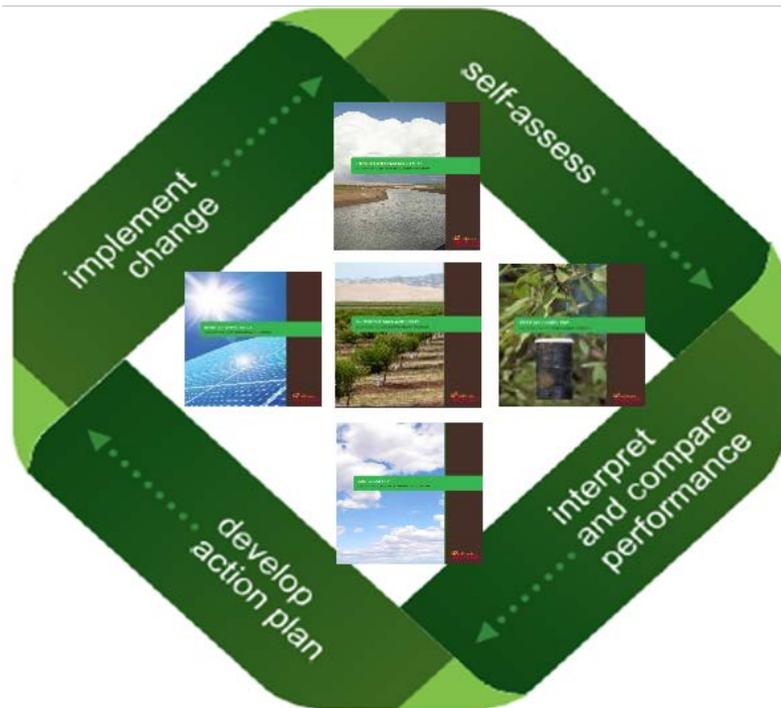
**Supply Chain  
Engagement  
Strategy**



**CASP Grower Education and Assessment Workshops**

# CASP IMPLEMENTATION APPROACH FOR CONTINUOUS IMPROVEMENT

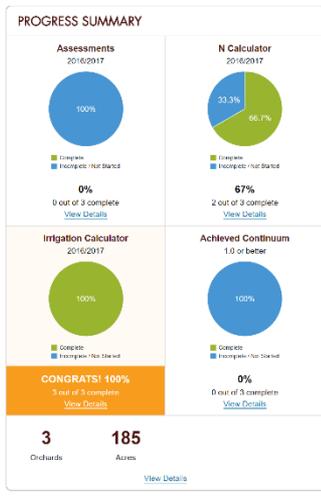
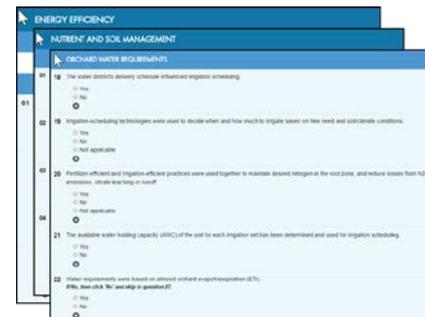
## Cycle of Continuous Improvement



Your Selection	Answer Choices	Use Statewide
	Drip	28.9%
	Micro-sprinkler	48.8%
	Flood / furrow	12.4%
	Sprinklers	9.9%
100.0 acre Inches/acre		
	Flow Meter	47.2%
	Estimate / Calculation	52.8%

# Data Gathering: Streamlining, New Module, & e-Modules

- **Module Streamlining**
  - Original Eight: Irrigation, Nutrient and Soil, Energy, Air, Pest, Ecosystems, Financial, Workplace and Community (complete)
- **e-Module Software Functionality Released**
  - First e-Module Implemented: Irrigation Continuum & Reporting
  - Second e-Module Coming Soon: Water Quality



**MOST RECENT ACTIVITY**

Assessments  
(11/02/2017) - Almond Board > Almond Board > Williams SWEEP Training [View](#)

N Calculator  
(11/28/2017) - Almond Board > Almond Board > Test [View](#)

Irrigation Calculator  
(11/02/2017) - Almond Board > Almond Board > starfields [View](#)

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**DATA SHARING SUMMARY**

Enrolling in Data Sharing enables sharing of information from the CASP system with your handler.

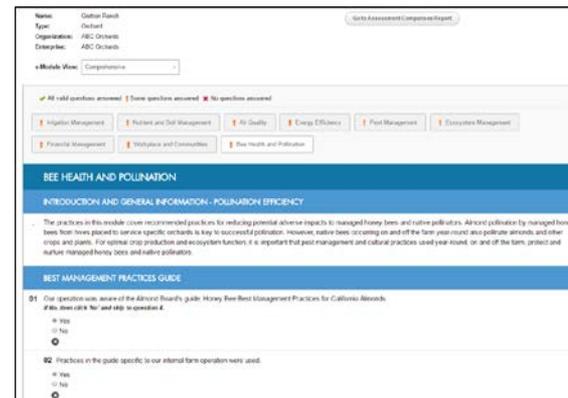
Click ENROLL NOW to enable sharing. You control what to share, how to share it and when to start or stop sharing.

[ENROLL NOW](#)

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**QUICK LINKS**

<b>Assessments</b> <a href="#">Go to Assessments</a> <a href="#">Clone Assessments</a>	<b>Reports</b> <a href="#">Action Plan Index</a> <a href="#">Assessment Scores</a> <a href="#">Assessment Comparison</a> <a href="#">E-IP Compliance Map</a> <a href="#">Irrigation Improvement Continuum</a> <a href="#">Manager Management Plan</a>
<b>Tools</b> <a href="#">N Calculator</a> <a href="#">Irrigation Calculator</a>	<b>Events</b>  <a href="#">Help</a>
<b>Orchards/Facilities</b> <a href="#">Add an Orchard</a> <a href="#">Go to Orchards</a> <a href="#">Go to Maps</a>	



# TOOL TO ASSIST IN MEETING REGULATORY REQUIREMENTS FOR GROWERS

- Almond N-budgeting tool simplifies ILRP compliance and optimizes N use



### NITROGEN MANAGEMENT PLAN WORKSHEET

1. Crop Year (Harvested):	2015	4. APN(s)	5. Field(s) ID	
2. Member ID #:	ID for Coalition	test2	Orchard 1	
3. Name:	Jessie A Santos			

CROP NITROGEN MANAGEMENT PLANNING		N APPLICATIONS/CREDITS	15. Recommended / Planned N	16. Actual N
6. Crop	Almonds	17. Nitrogen Fertilizers		
7. Production Unit	Pounds (kernel)	18. Dry/Liquid (lbs/ac)	60	
8. Projected Yield (Units/Acre)	0	19. Follar N (lbs/ac)	0	
9. N Recommended (lbs/ac)	0	20. Organic Material N		
10. Acres	25	21. Available N in Manure/Compost (lbs/ac estimate)	0	
<b>Post Production Actuals</b>		22. Total N Applied (lbs per acre)	60	
11. Actual Yield (Units/Acre)	-1	23. Nitrogen Credits (est)		
12. Total N Applied (lbs/ac)		24. Available N carryover (annualized lbs/acre)		
13. ** N Removed (lbs N/ac)		25. N in Irrigation water (a lbs/ac)		
14. Notes:		26. Total N Credits (lbs per acre)		
		27. Total N Applied & Available		

**PLAN CERTIFICATION**

28. CERTIFIED BY: \_\_\_\_\_

29. CERT \_\_\_\_\_

30. Low Vulnerability Area \_\_\_\_\_

31. Self-Certified, approve \_\_\_\_\_

DATE: \_\_\_\_\_

32. Self-Certified, UC or N \_\_\_\_\_

33. Nitrogen Management \_\_\_\_\_

PROFILE    PRACTICES    MAP

Name: Orchard 1  
Type: Orchard  
Organization: A Acme Orchards  
Enterprise: A Acme Orchards

Go To My Maps

**\*\* Your Coalition will provide the method to be used to estimate N Removed.**

Numbering in this Nitrogen Management Plan differs slightly from the template approved by the Central Valley Water Board 23 December 2014.

# AIM INITIATIVE TOOLS: IRRIGATION CONTINUUM



- e-Module view can be toggled between comprehensive displays of questions or subsets of questions per topic area
- Answers are auto-populated for duplicated questions across modules
- Report highlights proficiencies within the Continuum categories

## Irrigation Continuum Report

Organization: ABC Orchards  
Enterprise: A1 Acme Orchards  
Orchard: Honpareil  
Year: 2015/2016

Highlighting indicates Proficiency Level  
No Score = not assessed, 0 = did not meet 1.0 standard

Measurement	1.0 Minimum	2.0 Intermediate	3.0 Advanced	Score
Irrigation System Performance	Evaluate irrigation system for pressure variation and average application rate at least once every 3 years. Correct any diagnosed system performance problems.	Assess distribution uniformity and average application rate by measuring water volume at least every 3 years diagnosed system p	Assess distribution uniformity and average application rate by measuring water volume at least every 2 years.	3.0
Applied Water	Use application rate and duration of irrigation to determine water applied.	Use water meters to determine flow rate and water applied.		
Orchard Water Requirements	Estimate orchard water requirements using "normal year" regional ETC to estimate irrigation demand on a monthly time step.	Estimate orchard water requirements using "normal year" regional ETC to estimate irrigation demand on a bi-weekly time step.		
Soil Moisture	Evaluate soil moisture based upon feel and appearance by auguring to at least 3-5 feet. Monitor on a monthly time step.	Use manually operated soil moisture sensors to at least 3-5 feet and monitor on a bi-weekly time step. Ensure calculated water is not over/under irrigating trees.		
Plant Water Status	Evaluate orchard water status using visual plant cues just prior to irrigation or on a bi-weekly time step.	Use pressure chamber to measure midday stem water potential on a monthly time step. Ensure calculated water applications are not over/under irrigating trees.		

### ALMOND IRRIGATION IMPROVEMENT CONTINUUM

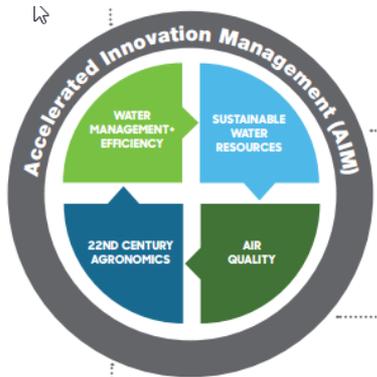
Use the proficiency levels and guidance below to adopt good irrigation water management practices for almonds. Each level of the *Almond Irrigation Improvement Continuum* will provide the tools necessary to obtain measurements needed to best schedule and manage almond irrigation.

Measurement	1.0 Minimum	2.0 Intermediate	3.0 Advanced
Orchard Water Requirements	Estimate orchard water requirements using "normal year" regional ETC to estimate irrigation demand on a monthly basis.	Estimate orchard water requirements using "normal year" regional ETC—adjusting for current weather and cover crop use on a bi-weekly basis.	Estimate orchard water requirements using "normal year" regional ETC to plan irrigations, then use real-time ETC data to correct the schedule on a weekly basis.
Irrigation System Performance	Evaluate irrigation system for pressure variation and average application rate at least once every 3 years. Correct any diagnosed system performance problems.	Assess distribution uniformity and average application rate by measuring water volume at least every 3 years. Correct any diagnosed system performance problems.	Assess distribution uniformity and average application rate by measuring water volume at least every 2 years. Correct any diagnosed system performance problems.
Applied Water	Use application rate and duration of irrigation to determine water applied.	Use water meters to determine flow rate and water applied.	Use water meters to determine applied water and compare to crop water use (ETc, evapotranspiration) to determine irrigation efficiency.
Soil Moisture	Evaluate soil moisture based upon feel and appearance by auguring to at least 3-5 feet. Monitor on a monthly time step.	Use manually operated soil moisture sensors to at least 3-5 feet and monitor on a bi-weekly time step. Use information to ensure calculated water is not over/under irrigating trees.	Use automated moisture sensors that store data over time. Review weekly to ensure calculated water is not over/under irrigating trees.
Plant Water Status	Evaluate orchard water status using visual plant cues just prior to irrigation or on a bi-weekly basis.	Use pressure chamber to measure midday stem water potential just prior to irrigation on a monthly basis. Ensure calculated water applications are not over/under irrigating trees.	Use pressure chamber to measure midday stem water potential just prior to irrigation on a weekly basis. Ensure calculated water applications are not over/under irrigating trees. Use it to assess when to start irrigating.
Integrating Irrigation Water Management Practices	Combine irrigation system performance data with "normal year" regional ETC to determine orchard-specific water requirements and schedule irrigations. Check soil moisture with an auger and/or monitor plant water status to verify scheduling.	Use irrigation system performance data with regional estimates of "normal year" ETC to schedule irrigations and adjust based on feedback from monitoring soil moisture or crop water status.	Develop an irrigation schedule based on predicted "normal year" demand, monitor status using soil and plant based methods. Adjust irrigation schedule with real-time ETC as the season progresses.



# TOOLS TO SUPPORT AIM INITIATIVES

- Irrigation calculator and revised irrigation module in support of Irrigation Improvement Continuum



The screenshot shows the "IRRIGATION SCHEDULE" page in the California Almonds web application. The page includes a navigation bar with the California Almonds logo and a "California Almonds Sustainability Program" badge. The main content area is titled "IRRIGATION CALCULATION WORK FLOW" and shows a "Crop Year: 2015 Orchard: Block 1 Organization: AAATEST production Business: AAATEST production".

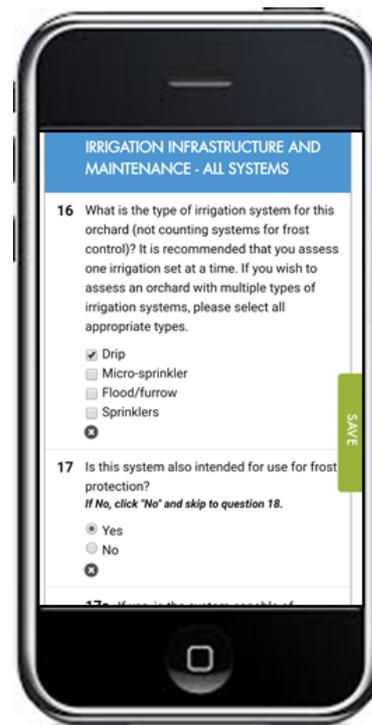
Below the flow, there are tabs for: WEATHER SETUP, ORCHARD SETUP, IRRIGATION SETUP, WEEKLY RUN TIMES, WEEKLY MEASURED RAINFALL, WEEKLY MEASURED SOILED MOISTURE, and WEEKLY OBSERVED TREE STRESS. The "IRRIGATION SETUP" tab is active.

The "IRRIGATION SETUP" section includes:
 

- Buttons: Save, Close, Delete
- Form fields: Use Station associated with ZIP (checkbox), Orchard ZIP code, CIMIS Station (dropdown menu showing "Shafter (5)"), and Source of ETo data (radio buttons for Spatial CIMIS and CIMIS Station).
- Text: \*denotes required for calculations

On the right side, there are "REPORTS" and "CALCULATIONS" sections. The "CALCULATIONS" section features a table with the following data:

Week	Entered Run Hrs	Run Hrs to Meet Etc	Run Hrs to Meet ASM	Calc % ASM Depleted	Entered % ASM Depleted	Obs Tree Status
1/3 - 1/9		2.2	0.0	0%		
1/10 - 1/16		2.9	2.9	5%		
1/17 - 1/23		2.6	5.5	10%		
1/24 - 1/30		3.4	8.9	17%		
1/31 - 2/6		4.0	8.7	16%		





# CASP STRATEGIC INDUSTRY POSITIONING

## Industry Association



## Brand Sourcing Programs



## SAI-FSA Meta-Standard



## 3rd Party Certification Standards





# HOW CASP CAN HELP YOU TELL *YOUR* STORY!

Mel Machado, Blue Diamond Growers



# WHY IS IT RELEVANT TO THE GROWER?

Simply stated.... Customers & Consumers Want It!!!

- Consumer Detachment from Food Production

- Lack of Knowledge Regarding Production Practices
- Bad Press on Crop Protection Materials, Water, Labor, Bees...
- Science is “Bad”
- Belief that “Non-Conventional is Better”

- Consumer Attraction to their Food

- Values and Expectations
- Simple Ingredients/Clean Labels
- Lifestyle
- Health
- Authenticity
- Trust

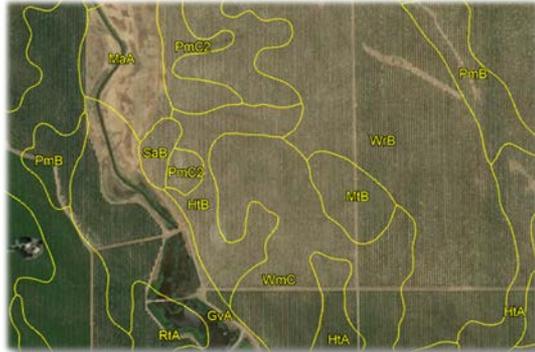
- “There’s Always a Better Way...”



# WHY IS IT RELEVANT TO THE GROWER?

## Growers Already Have Most of the Data

- Field, Fertilizer, Irrigation, Pest Management Records Exist
- Much of the information is “Second Nature”
  - Some is “Second Thought”



# WHY IS IT RELEVANT TO THE GROWER?

## Profitability and the “Right to Farm”

- Re-build Credibility
  - An Inconvenient Truth...
    - People Love Farmers... But They Don't Like Agriculture
- Build & Strengthen Markets
  - No Cost to Participate
  - Potential Large Cost in an Information Vacuum
- Personal Development
  - Make You a Better Grower
    - Learnings from the Community of Almond Growers
    - Free Resources
    - Regulatory Relief... Nitrogen Budget





# HOW CASP CAN HELP YOU TELL *YOUR* STORY!

Julie Adams,  
Vice President, Global Technical & Regulatory Affairs



# THINK ABOUT THE HISTORY-MAKING CONVERSATIONS THAT FEATURED ALMONDS.....

\$11 Billion to CA Budget

Sustainable production

Pesticide residues

“Colony Collapse”

Bee BMPs

2 billion pounds

**Right to Farm**

Aflatoxin rejections

#1 snack nut

#1 ag crop in California

*We cannot expect those not involved in almonds to understand our challenges ....*

Healthiest nut

Gallon per kernel

Monoculture

Dust

Groundwater over-pumping

1 BILLION pounds

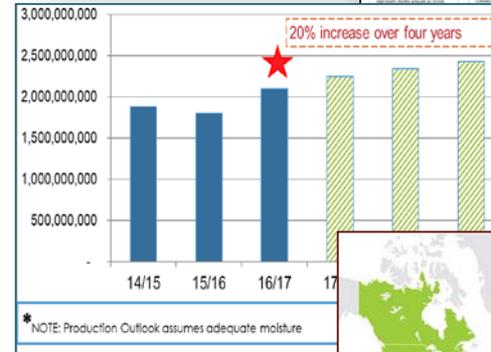
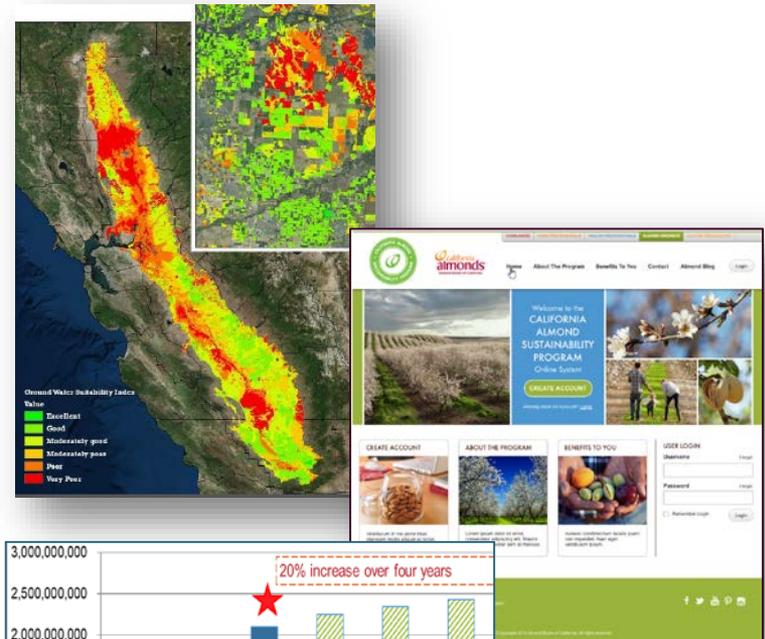
Recharge

# MAINTAINING REPUTATION IN A CHALLENGING FUTURE

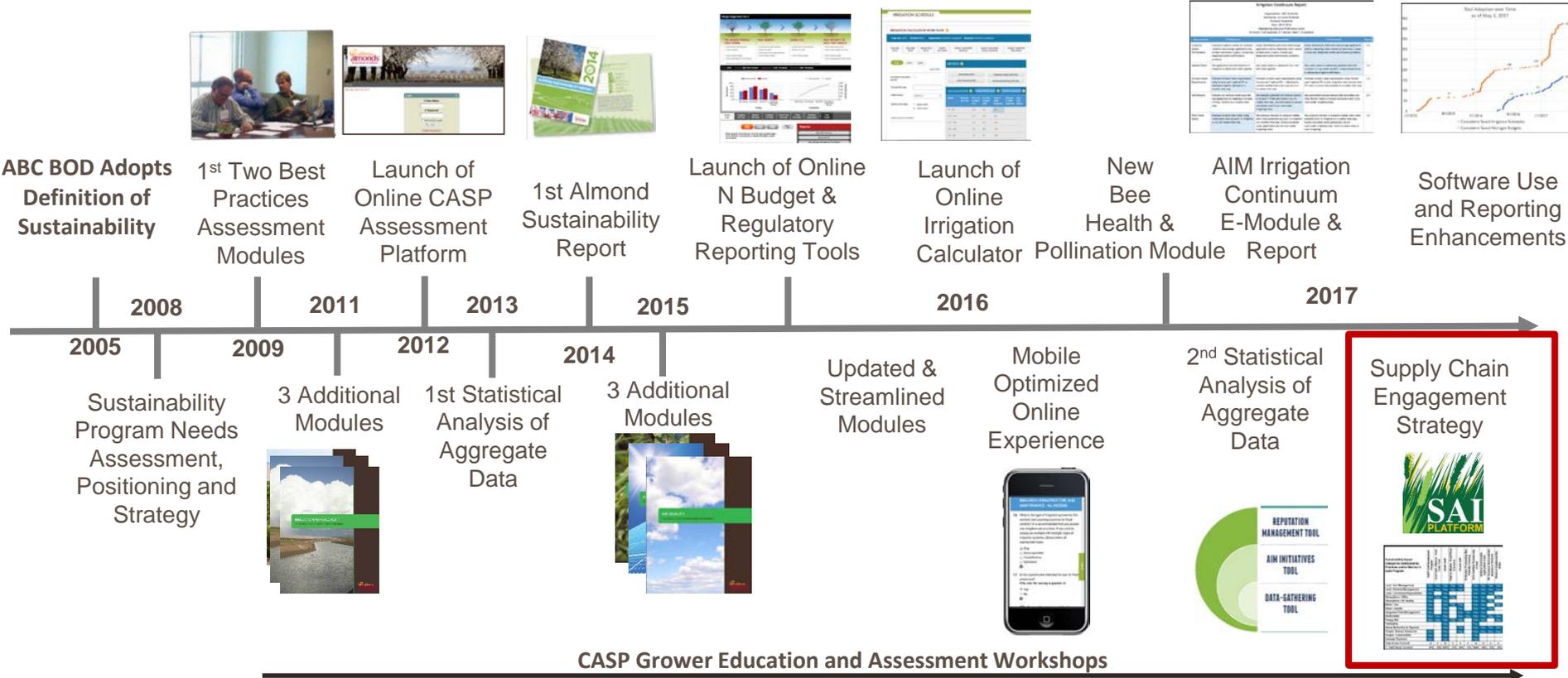
- Anticipated **production increase** by 2020
- Challenges for **agricultural resources** never higher

But, if we.....

- Don't **speak the same language** as our customers
- Don't have the **same priorities**
- Focus on **differences** rather than **where we are the same...**



# CASP EVOLUTION TIMELINE: 2005- 2017 YTD





## Industry Associations



## Brand Sourcing Programs



**PEPSICO**



## 3rd Party Certification Standards



## Industry Association



**Field to Market**  
The Alliance for Sustainable Agriculture



**Brand Sourcing Programs**



## SAI/FSA Meta-Standard



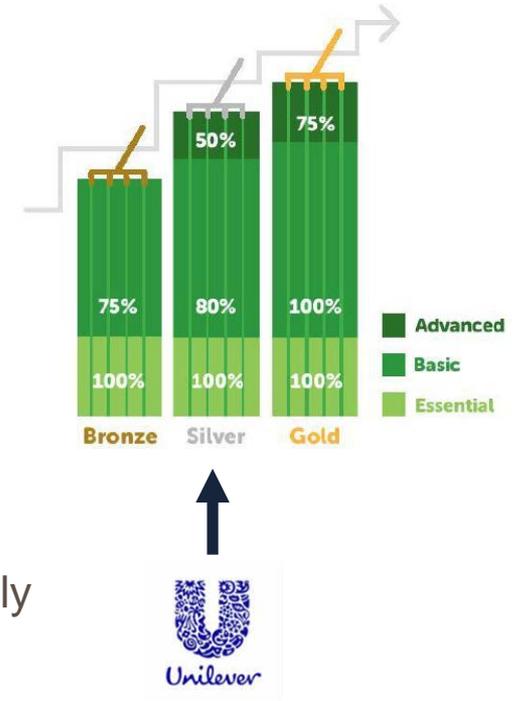
**CASP is strategically positioned**

## 3rd Party Certification Standards



# WHY BENCHMARK TO THE SUSTAINABLE AG INITIATIVE?

Performance Levels	Threshold <i>(see also SAI FSA Guidance on <a href="http://www.saiplatform.org">www.saiplatform.org</a>)</i>
Bronze	Compliance to 100% 'Essential' questions and a minimum of 75% 'Basic' questions.
Silver	Compliance to 100% 'Essential' questions, 80% 'Basic' questions and more than 50% 'Advanced' questions.
Gold	Compliance to 100% 'Essential' questions, 100% 'Basic' questions and a minimum of 75% 'Advanced' questions.
Not yet Bronze	Indicates that the level of performance does not meet the bronze threshold yet.



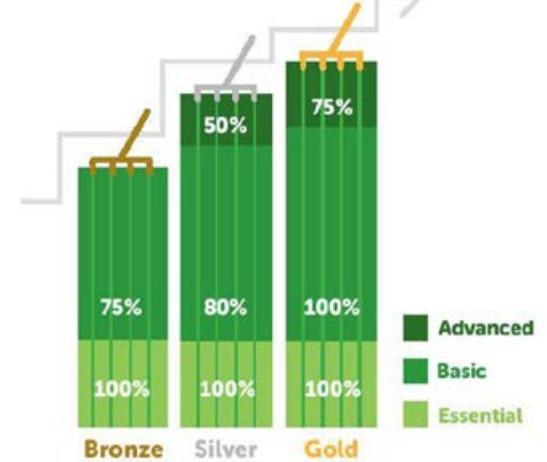
- Mars, Mondelez, M&S, PepsiCo – support improving ag supply chain data with SAI/FSA
- Aligning questionnaires *minimizes redundancy, duplication*

# FSA BENCHMARK OF CASP TO GOLD PERFORMANCE LEVEL

## RESULTS: CASP with California & Federal Legislation

Based on the **MINIMUM** Score

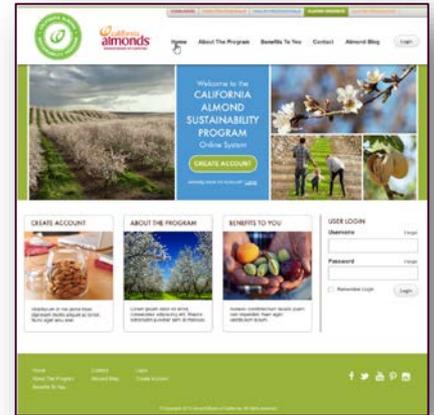
Performance level	Gold		
Scores <small>(Calculation with exclusion of Not Applicable FSA-questions)</small>	Essential	Basic	Advanced
Legal Compliance	100%	100%	No Advanced
Farm Management	No Essential	100%	0%
Health & Safety	100%	100%	100%
Local Community	100%	No Basic	100%
Planting	No Essential	100%	100%
Soil Management	No Essential	100%	100%
Nutrient Management	No Essential	100%	100%
Crop Protection	100%	100%	75%
Agro-chemicals	100%	100%	No Advanced
Waste Management	No Essential	100%	No Advanced
Water Management	100%	100%	100%
Biodiversity	100%	100%	100%
Greenhouse Gas Emissions	No Essential	100%	100%
Air	No Essential	No Basic	100%
Financial Stability	No Essential	100%	100%
Market Access	100%	100%	100%
Labor Conditions	100%	100%	75%
<b>TOTAL</b>	100%	100%	89%
	No Answer		0%



Existing almond practices under CASP address most areas identified by SAI/FSA  
**Only 2 programs in the U.S. benchmark GOLD!**

# STAYING IN THE **LEAD** IS THE *REAL STORY* OF CALIFORNIA ALMONDS

- Sustainability and reputation **start in the orchard**
- CASP **helps growers first**, to assess practices and address regulatory requirements
- Benchmarking against generic platforms
  - translates current **documented practices** into a **common language**
  - Shows supply chain that our **priorities are already aligned**
- Customers and consumers can **trust our values**, and have confidence that almonds **are the right Crop** for California!



**“History will be kind to me  
for I intend to write it.”**

**— Winston S. Churchill**

# What's Next

## Wednesday, December 6 at 11:10 a.m.

- Tools for Better Irrigation – Room 308-309
- Research Update: Growing and Harvesting – Room 312-313
- Sensory and Analytical: Where Science Meets Art – Room 314
- Going Nuts for Beauty: From California to China – Room 306-307

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