



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.
- Pickup verification sheet at conclusion of each session.
- 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**



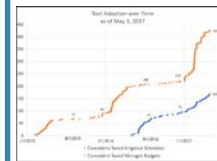
**Launch of Online
N Budget &
Regulatory
Reporting Tools**



**Launch of
Online
Irrigation
Calculator**

**New
Bee
Health &
Pollination Module**

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



**Software Use
and Reporting
Enhancements**

2008

2011

2013

2015

2016

2017

2005

2009

2012

2014

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

**3 Additional
Modules**



**1st Statistical
Analysis of
Aggregate
Data**

**3 Additional
Modules**



**Updated &
Streamlined
Modules**

**Mobile
Optimized
Online
Experience**



**2nd Statistical
Analysis of
Aggregate
Data**



**Supply Chain
Engagement
Strategy**

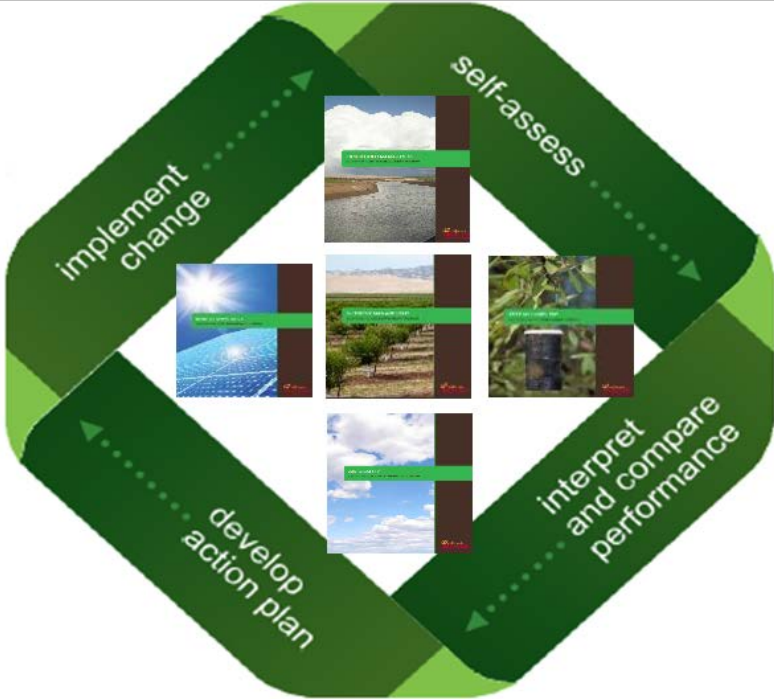


CASP Grower Education and Assessment Workshops

CASP IMPLEMENTATION APPROACH FOR CONTINUOUS IMPROVEMENT



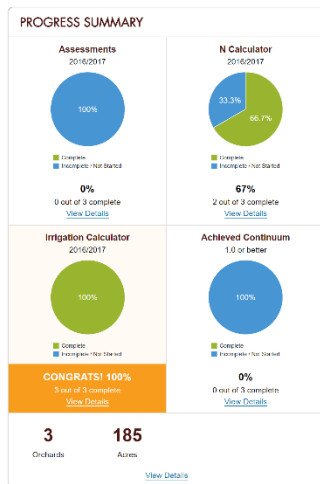
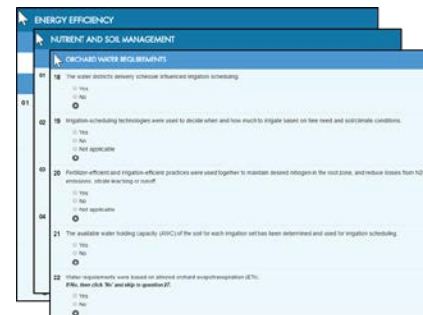
Cycle of Continuous Improvement



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
(11/02/2017) - Almond Board > Almond Board > Test [View](#)

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

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](#)

QUICK LINKS

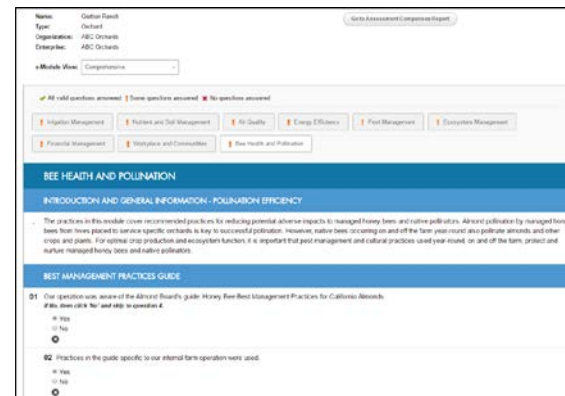
Assessments
[Go to Assessments](#)
[Done Assessments](#)

Tools
[N Calculator](#)
[Irrigation Calculator](#)

Orchards/Facilities
[Add an Orchard](#)
[Go to Orchards](#)
[Go to Maps](#)

Reports
[Action Plan Notes](#)
[Assessment Scores](#)
[Assessment Comparison](#)
[E-IP Compliance Map](#)
[Irrigation Improvement Continuum](#)
[Nutrient Management Plan](#)

Events
[Help](#)



TOOL TO ASSIST IN MEETING REGULATORY REQUIREMENTS FOR GROWERS

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

WELCOME TO ALMONDS.COM

ALMOND GROWERS

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N CALCULATOR

NITROGEN BUDGET WORK FLOW

PRE-SEASON THROUGH EARLY SPRING

- Enter Kernel Yield Estimate
- Enter N Credits
- Enter Fertilizer App(s)
- Show N Management Plan Report

FRUIT GROWTH

- Review Kernel Yield Estimate
- Review N Credits
- Enter Early Leaf Sampling Results
- Enter Fertilizer App(s)

KERNEL FILL

- Review Kernel Yield Estimate
- Review N Credits
- Enter Fertilizer App(s)

FRUIT MATURITY OR EARLY POST HARVEST

- Enter Actual Kernel Yield
- Enter Actual Irrigation N Credit
- Enter Fertilizer App(s)
- Show N Management Plan Report

Illustrations courtesy of D. Gosselin, CDFA Fertilizer and Research Education Program (FREP) for Almond Nitrogen Fertilization Guidelines

Crop Year: 2015 Orchard: Orchard 1 Organization: A Acme Orchards Business: A Acme Orchards

Timing



Cumulative



Kernel Yield Irrigation N Credit Manure N Credit Compost N Credit Cover Crop N Credit Other N Credits Fertilizer Application Leaf Factor Water Coalition Information

Previous Tab Save Budget Close Budget Delete Budget Next Tab



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	
Post Production Actuals		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, approved
DATE:	32. Self-Certified, UC or N
	33. Nitrogen Management

PROFILER 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—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.	
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.	Use automated 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.	
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.	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 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.	

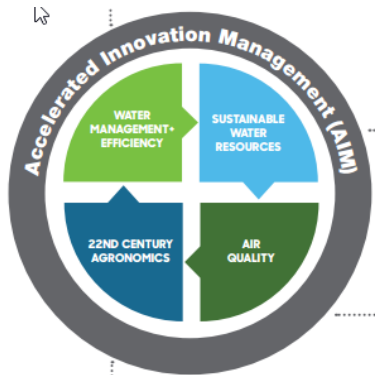
ALMOND IRRIGATION IMPROVEMENT CONTINUUM

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 to at least 3-5 feet and monitor 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.
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TOOLS TO SUPPORT AIM INITIATIVES

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



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IRRIGATION SCHEDULE

IRRIGATION CALCULATION WORK FLOW

Crop Year: 2015 Orchard: Block 1 Organization: AAATEST production Business: AAATEST production

WEATHER SETUP ORCHARD SETUP IRRIGATION SETUP WEEKLY RUN TIMES WEEKLY MEASURED RAINFALL WEEKLY MEASURED SOILED MOISTURE WEEKLY OBSERVED TREE STRESS

Save Close Delete

Use Station associated with ZIP: ☐

* Orchard ZIP code:

* CIMIS Station:

* Source of Eto data: ☐ Spatial CIMIS ☒ CIMIS Station

* devices required for calculations

REPORTS

Show Detail (PDF) Download Details (CSV File)

Show Summary (PDF) Download Summary (CSV File)

CALCULATIONS

Update Weather Data Refresh Calculations

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%			

IRRIGATION INFRASTRUCTURE AND MAINTENANCE - ALL SYSTEMS

16 What is the type of irrigation system for this orchard (not counting systems for frost control)? It is recommended that you assess one irrigation set at a time. If you wish to assess an orchard with multiple types of irrigation systems, please select all appropriate types.

☒ Drip
☐ Micro-sprinkler
☐ Flood/furrow
☐ Sprinklers

17 Is this system also intended for use for frost protection?
 If No, click "No" and skip to question 18.

☒ Yes
☐ No

SAVE

CASP STRATEGIC INDUSTRY POSITIONING

Industry Association



Brand Sourcing Programs



PEPSICO

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

Healthiest nut

Monoculture

Gallon per kernel

Dust

Groundwater over-pumping

1 BILLION pounds

Recharge

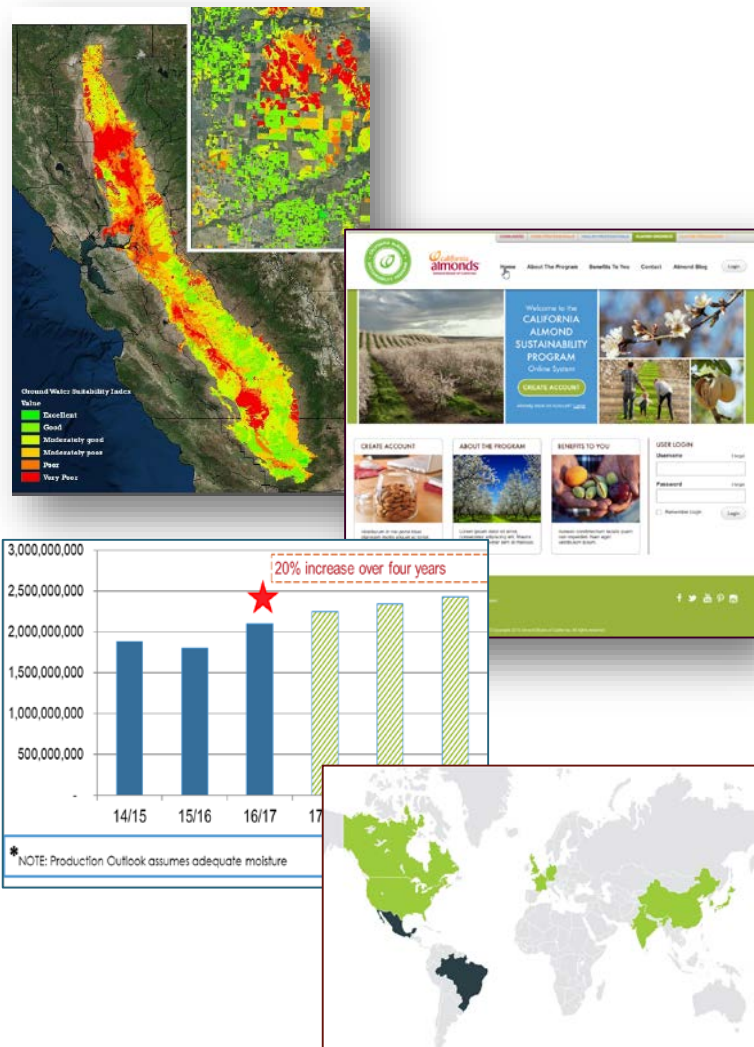
*We cannot expect
those not involved
in almonds to
understand our
challenges*

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



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**1st Two Best
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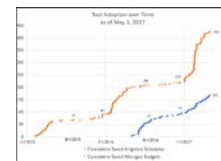
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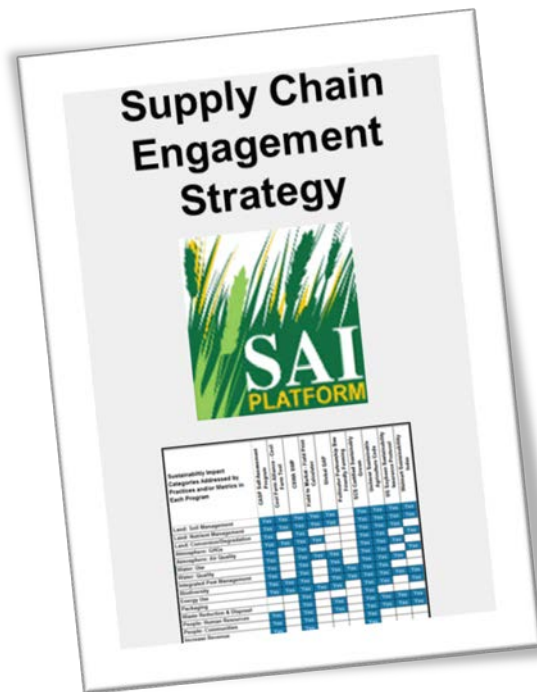
**Supply Chain
Engagement
Strategy**



CASP Grower Education and Assessment Workshops

MAKING **OUR STORY** THE REAL BENCHMARK FOR CALIFORNIA ALMONDS

- Media **will** keep almonds high profile
- CASP documents **almond grower** continuous improvement – you are **already doing** what the supply chain wants!
- Global sustainability programs are **generic**; they don't reflect individual commodities or origins
- Building on **what we already do** avoids creating more work for growers and handlers
- Benchmarking CASP, and the regulatory environment, **is the common language**



Industry Associations



Brand Sourcing Programs



PEPSICO



3rd Party Certification Standards



Industry Association



Brand Sourcing Programs



PEPSICO



SAI/FSA Meta-Standard



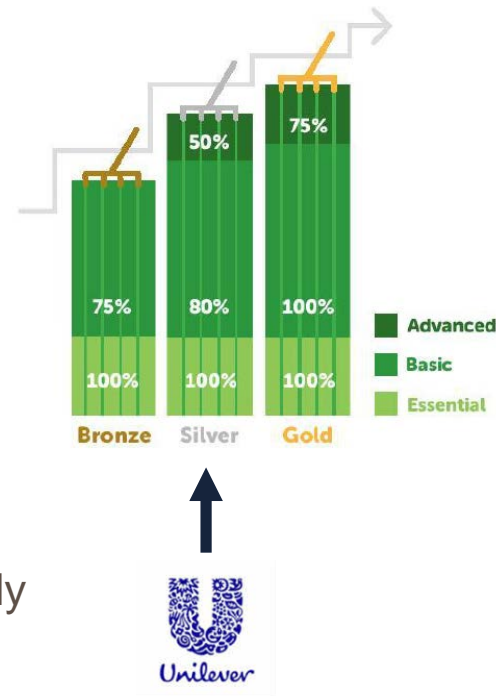
3rd Party Certification Standards



**CASP is
strategically
positioned**

WHY BENCHMARK TO THE SUSTAINABLE AG INITIATIVE?

Performance Levels	Threshold (see also SAI FSA Guidance on www.saiplatform.org)
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.



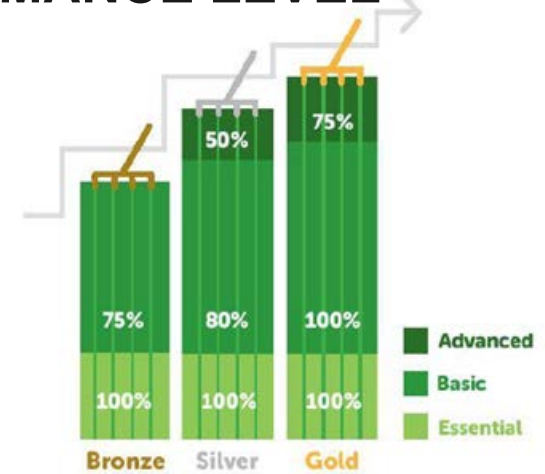
- Mars, Mondelez, M&S, PepsiCo – support improving ag supply chain data with SAI/FSA
- Aligning questionnaires *minimizes redundancy, duplication*

FSA BENCHMARK OF CASP TO GOLD PERFORMANCE LEVEL

RESULTS: CASP with California & Federal Legislation

Based on the **MINIMUM** Score

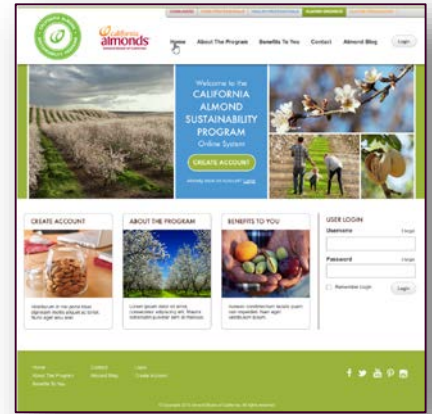
Performance level	Gold		
Scores <small>(Calculation with exclusion of Not Applicable FSA-questions)</small>	Essential	Basic	Advanced
Legal Compliance	100%	100%	No Advanced
Farm Management	No Essential	100%	0%
Health & Safety	100%	100%	100%
Local Community	100%	No Basic	100%
Planting	No Essential	100%	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%
TOTAL	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

CEUs – New Process

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