



Sustainability and Almonds: From the Orchard to the Shelf

December 7, 2016



Sustainability and Almonds: From the Orchard to the Shelf

- Julie Adams, Almond Board of California (Introduction)
- Gabriele Ludwig, Almond Board of California (Introduction)
- Jeff Dlott, SureHarvest
- Tess Wilkins, Costco Wholesale
- Daniel Sonke, Campbell Soup Company
- Craig Duerr, Campos Brothers Farms





**Gabriele Ludwig and Julie Adams,
Almond Board of California**



What is the California Almond Sustainability Program?

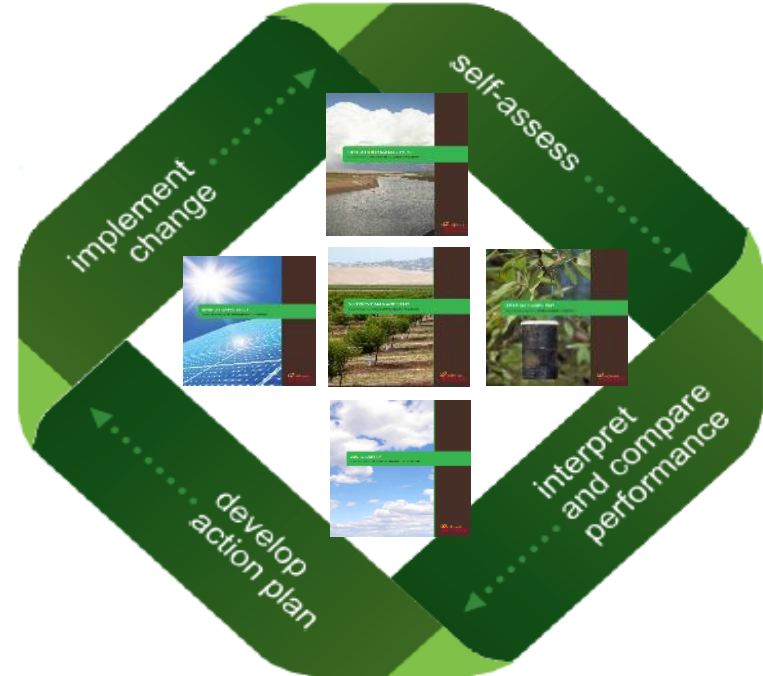
Gabriele Ludwig, Director,
Sustainability & Environmental Affairs



The CASP Approach

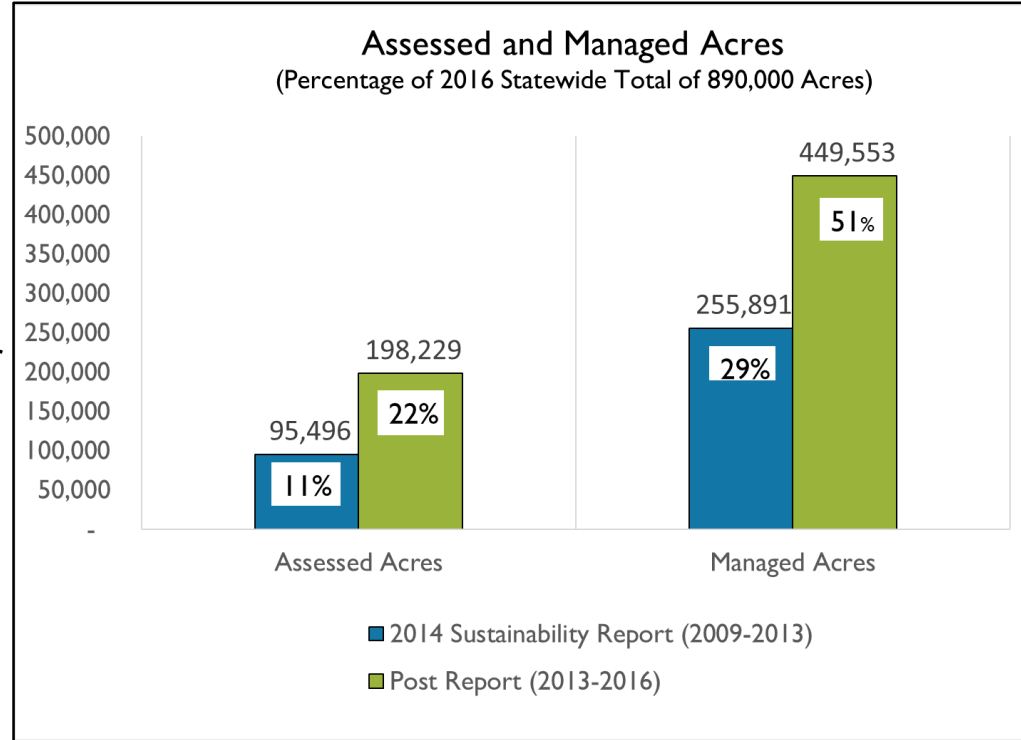
- Established in 2009, CASP encourages almond grower and handler self-assessment to track adoption of responsible farming practices
- Current CASP modules
 - Irrigation management
 - Nutrient and soil management
 - Air quality
 - Energy efficiency
 - Ecosystem management
 - Financial management
 - Pest management
 - Workplace and communities
 - *NEW*: Bee Health and Pollination

Cycle of Continuous Improvement



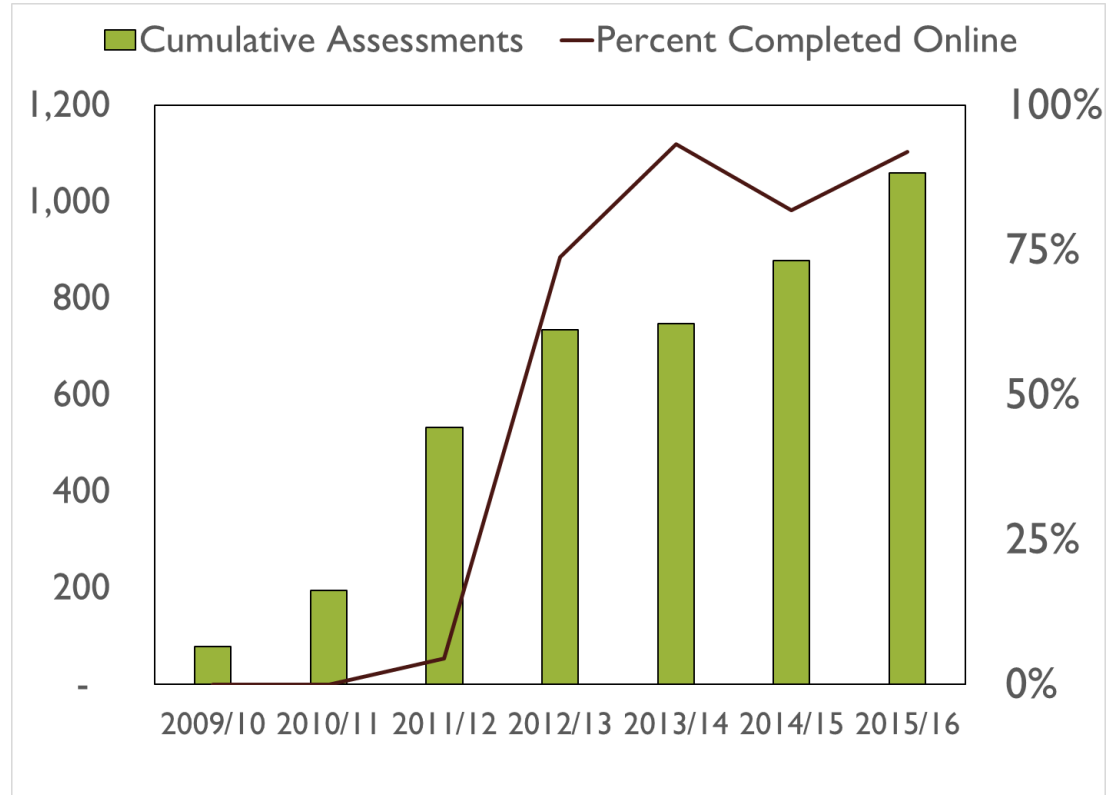
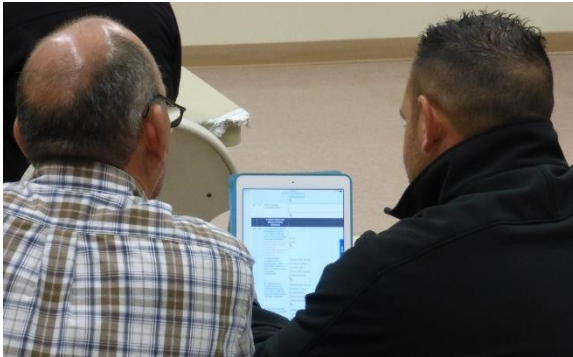
Self-Assessment of Practices

- Jump in acres assessed since 2013 season
 - Doubled from 11% to 22%
- More than 50% of managed acres
 - Managed acres are the total acres under management by companies that have completed an assessment



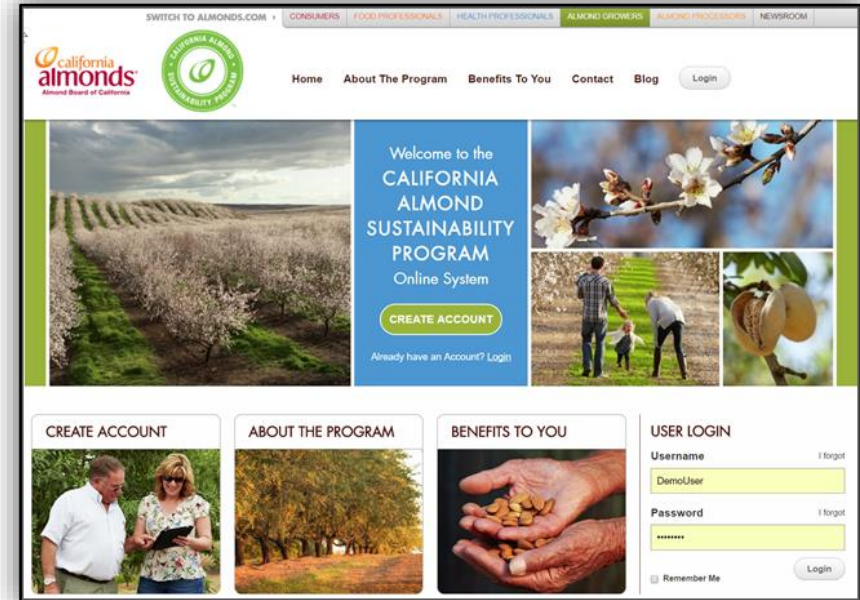
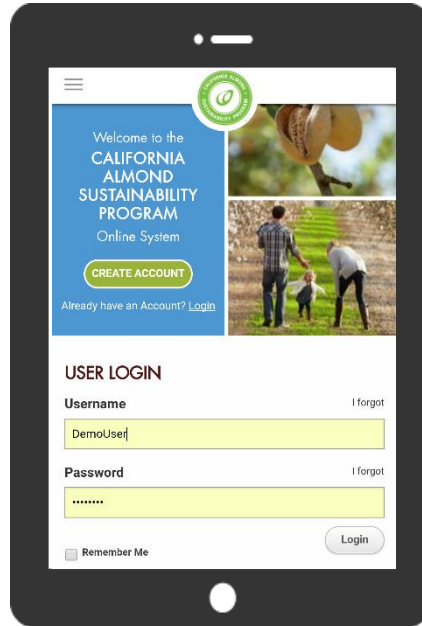
Self-Assessment of Practices

- Significant increase in the percentage of assessments completed online



Self-Assessment of Practices

- 2016-2017: Investment in next generation online experience
 - New look and feel, improved user experience for phone, tablet, & desktop



A Data Gathering Tool

- A Tool to have Data on grower and handler practices
 - CASP participation and the data to inform stakeholders and media

BETTER TOGETHER

Through the California Almond Sustainability Program, we've achieved:

449,553

ACRES OF CALIFORNIA ALMONDS REPRESENTED BY ASSESSMENTS COMPLETED

3,173

SELF-ASSESSMENT MODULES COMPLETED

120

EDUCATIONAL WORKSHOPS WITH OVER 1,600 PARTICIPANTS

8

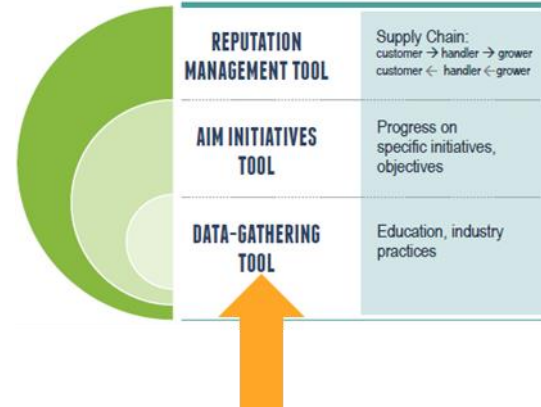
EDUCATIONAL SELF-ASSESSMENT MODULES

2

RESEARCH-BASED CALCULATORS:
• IMPROVING IRRIGATION
• FINE-TUNING FERTILIZER

1

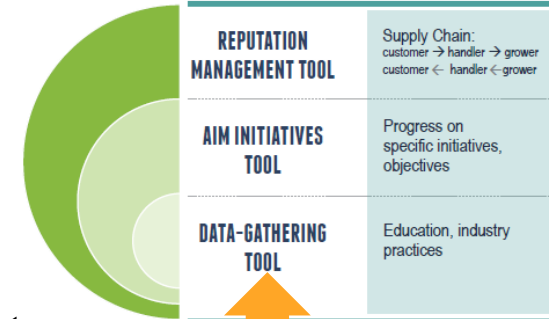
PROGRAM DEVOTED TO CONTINUOUS IMPROVEMENT



A Tool for Grower/Handler Feedback

- Confidential, customized benchmark reports by module and individual practice
- Hold outreach events on grower relevant topics

	Practice or Metric	Your Selection	Use Statewide
Irrigation Management Module			
INTRODUCTION AND GENERAL INFORMATION - IRRIGATION MANAGEMENT			
ORCHARD ESTABLISHMENT			
1	Were you involved in this orchard's establishment?		82.7 %
2	Soil maps (e.g., NRCS soil series or web soil survey) were used to identify potential variations in soil texture, salinity, water holding capacity, or other factors.	Yes	61.8 %
3	Aerial or satellite photos (e.g., Google Earth) were used to identify potential variations in soil texture, salinity, or other factors.		46.0 %
4	Yield maps from the previous crop (almonds or another crop) were used to identify potential variations in soil texture, salinity, or other factors.		45.4 %
5	A GPS map of soil characteristics using sensing technology (e.g., EC, Veris (R) or SIS) was made and used to identify potential variations in soil texture, salinity, or other factors.		15.2 %
6	Backhoe pits were dug or deep auger/core samples were taken (guided by the above and other observed factors) in strategic places to determine:		
	6a. texture (percent sand, clay, silt) or saturation percentage		67.4 %
	6b. compaction layers or other soil stratification		70.9 %
	6c. salinity		63.3 %
	6d. pH		68.3 %
	6e. soil organic matter		60.2 %



Weed ID event



A Tool to Assist in Meeting Regulatory Requirements for Growers

- Tools to simplify ILRP compliance and optimize 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. Foliar 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 in soil (annualized lbs/acre)	0		
13. ** N Removed (lbs N/ac)		25. N in Irrigation water (annualized, lbs/ac)	0		
14. Notes:		26. Total N Credits (lbs per acre)	0		
		27. Total N Applied & Available (lbs per acre)	60		

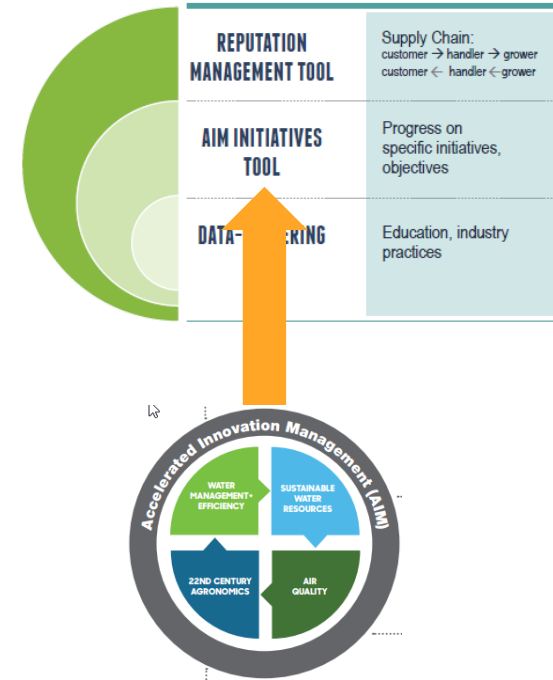
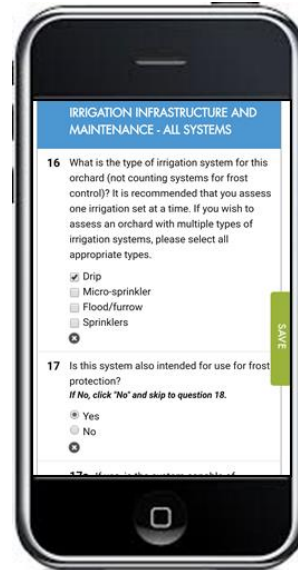
PLAN CERTIFICATION	
28. CERTIFIED BY:	29. CERTIFICATION METHOD
	X
	30. Low Vulnerability Area, No Certification Needed
	31. Self-Certified, approved training program attended
DATE:	32. Self-Certified, UC or NRCS site recommendation
	33. Nitrogen Management Plan Specialist

** 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.

A Tool to Support AIM Initiatives

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

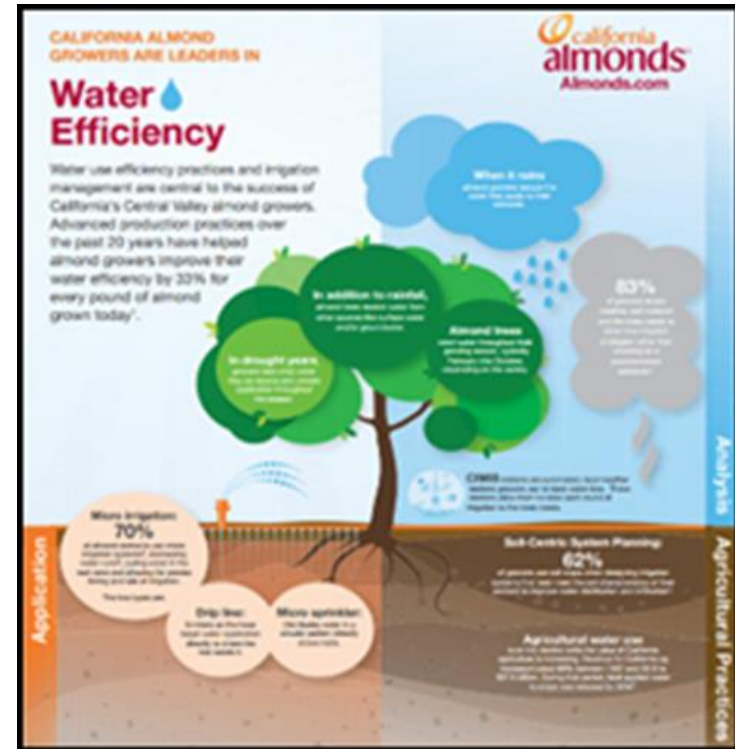
Week	Entered Run Hrs	Run Hrs to Meet Etc	Run Hrs to Meet ASM	Calc % ASM Depleted	Entered % ASM Depleted	Obs Tree Status
1/3 - 1/9	2.2	0.0	0%			
1/10 - 1/16	2.9	2.9	5%			
1/17 - 1/23	2.6	5.5	10%			
1/24 - 1/30	3.4	8.9	17%			
1/31 - 2/6	4.0	8.7	16%			



A Tool to tell Our Story – with Facts

Through Almond Board research programs, almond farmers have been funding **water efficiency research since 1982** with over **90 projects** funded to date.

- Over the past 20 years, almond growers have improved their **water use efficiency by 33%**, producing **more crop per drop**.
- **70% of almond orchards use micro-irrigation**, applying water directly in the root zone, and allowing for precise timing and rate of irrigation.
- **83% of growers practice demand-based irrigation** using a combination of weather data, tree demand data, and/or soil moisture data



Telling our Story with CASP is Supported by the Research at the Almond Board of California

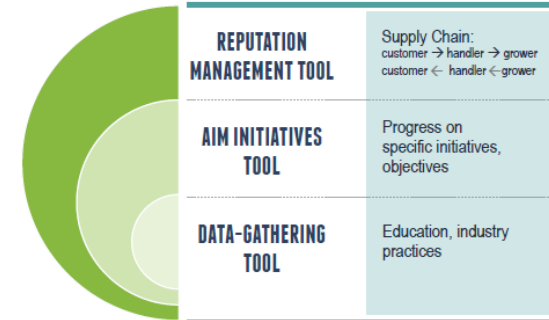
- Consistently funding and executing initiatives since 1973
- Total investment since 1973 of more than **\$50 million** to date.

➔ Tradition of Continuous Improvement



A Tool to Help Meet Buyers Interest & Concerns

- Have more questions from almond buyers about sustainability
 - Over last 2 years multiple meetings/webinars with key almond buyers re sustainability
- Simply having a program that has been in place since 2009 impresses
- Having data re certain practices helpful
 - E.g. how widespread is micro irrigation adoption?
- Working now to see how can leverage the CASP further for individual handlers
 - At the industry Round up this morning, we heard that documenting sustainable practices is a way to build confidence with buyers and consumers
 - Jeff Dlott will be presenting next on creating opportunities to leverage CASP in the supply chain





Jeff Dlott,
SureHarvest

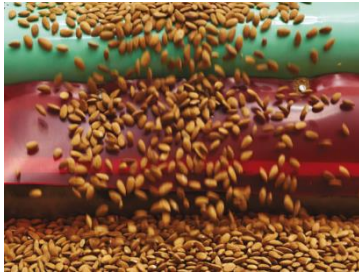


CASP Connecting with the Supply Chain

Jeff Dlott, President/CEO
SureHarvest



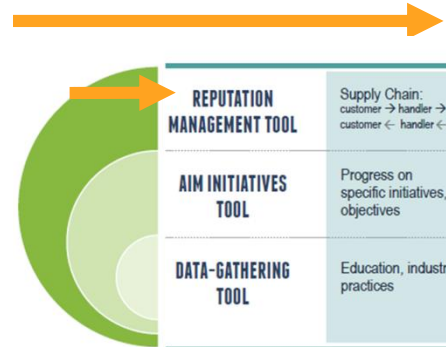
The Almond Supply Chain



Connecting
CASP

Flow of goods and services

- Value generation at each link
- Value attributes
 - Inherent: taste, nutrition, safety
 - Added: transparency, sustainability, assurance



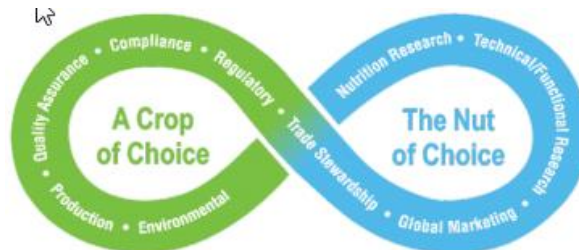
The Almond Supply Chain



Value attributes based on information and flow

- Bi-directional, clearly linking demand and supply

How produced?
Where from?
Other attributes



CASP's Core Information Attributes

- Breadth and Depth?
- Credibility and Rigor?
- Supply Chain Relative Importance?
- Assurance?



ASSESSMENTS
Irrigation Management
Nutrient and Soil Management
Air Quality
Energy Efficiency
Pest Management
Ecosystem Management
Financial Management
Workplace and Communities
Bee Health and Pollination

ALTERNATIVE FORAGE FOR POLLINATORS

45 Hedgerows of flowering shrubs, such as coyote brush, were maintained along at least some edges of the farm or facility to provide alternative nutrition sources for managed and native pollinators and pest natural enemies.

Yes

No

Not applicable

X

Breadth and Depth



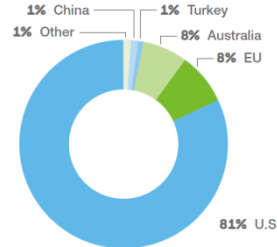
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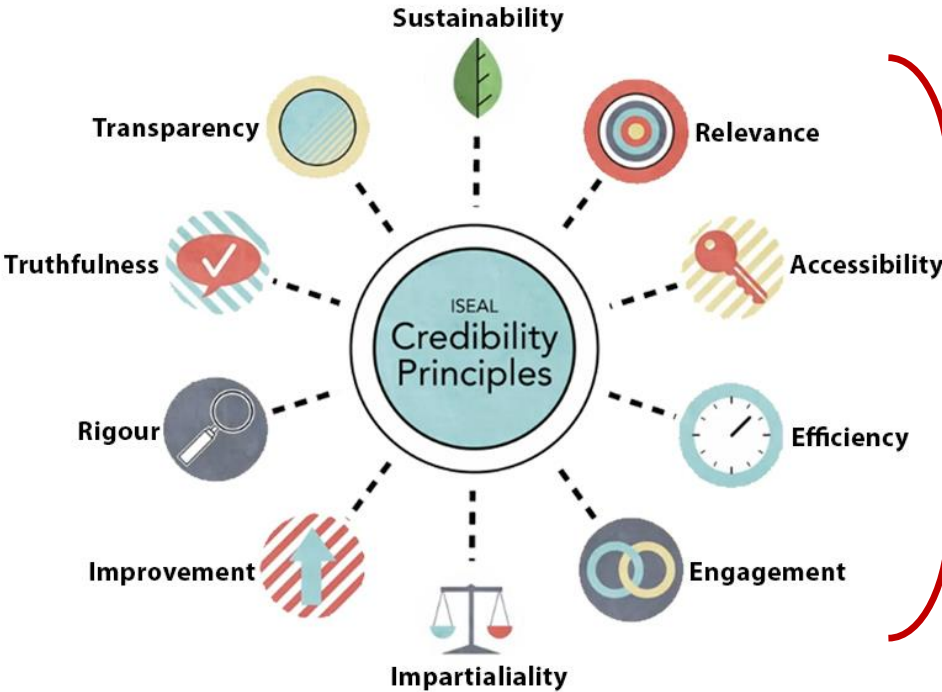
Sustainability Areas Covered by Practices and/or Metrics	CASP Self-Assessment Program	Global GAP	Rainforest Alliance - SAN	SCS Certified Sustainably Grown
Land: Soil Management	Yes	Yes	Yes	Yes
Land: Nutrient Management	Yes	Yes	Yes	Yes
Land: Conversion/Degradation	Yes		Yes	Yes
Atmosphere: GHGs	Yes		Yes	Yes
Atmosphere: Air Quality	Yes			Yes
Water: Use	Yes	Yes	Yes	Yes
Water: Quality	Yes	Yes	Yes	Yes
Integrated Pest Management	Yes	Yes	Yes	Yes
Biodiversity	Yes	Yes	Yes	Yes
Energy Use	Yes	Yes	Yes	Yes
People: Human Resources	Yes	Yes	Yes	Yes
People: Communities	Yes		Yes	Yes
Increase Revenue	Yes			Yes
Total No. of Areas Covered	13	8	11	13
% Total No. of Areas Covered	100%	62%	85%	100%

Credibility and Rigor

WORLD ALMOND PRODUCTION 2015/16



Source: Almond Board of California, Almond Board of Australia and INC.



ISEAL Principle	CASP Self-Assessment Program	Global GAP	Rainforest Alliance - SAN	SCS Certified Sustainably Grown
Sustainability	92%	100%	75%	75%
Improvement	83%	100%	50%	100%
Relevance	100%	100%	100%	83%
Total Rigor	83%	75%	50%	61%
Engagement	92%	75%	100%	100%
Impartiality	100%	100%	83%	100%
Transparency	83%	67%	44%	56%
Accessibility	89%	78%	67%	67%
Truthfulness	100%	100%	83%	83%
Efficiency	100%	67%	83%	100%
% of Total Points	92%	85%	74%	82%

Supply Chain Relative Importance: Bee Health & Pollination?

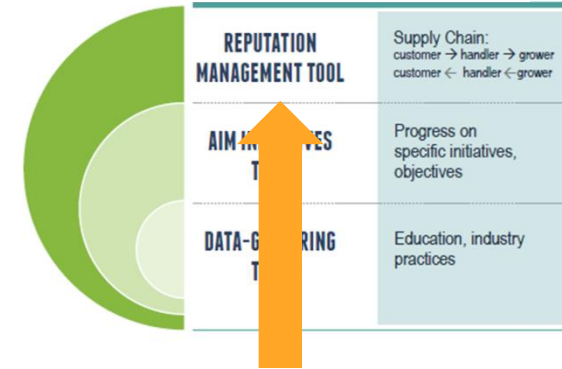
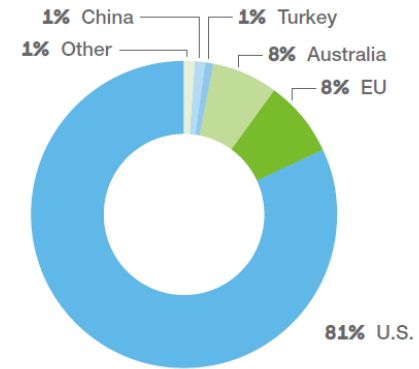
- Critical to production, high interest by consumers
 - Opportunity to ask our panel members
- Expert content & best practices captured in new CASP module
- Next generation CASP technology to simplify information management

POLLINATION PARTNERS



Supply Chain Confidence: Assurance

- Range of approaches each with benefits & costs
 - Assessment
 - Verification of implementation
 - Certification to a standard
- Key value propositions
 - Creating enough value at each link in the supply chain to be economically sustainable
 - Driving out costs, e.g. reducing redundancy
- Next steps are to engage supply chain partners to collaborate on assurance solutions
- We are very fortunate to get started today
 - Our panel members coming up next!



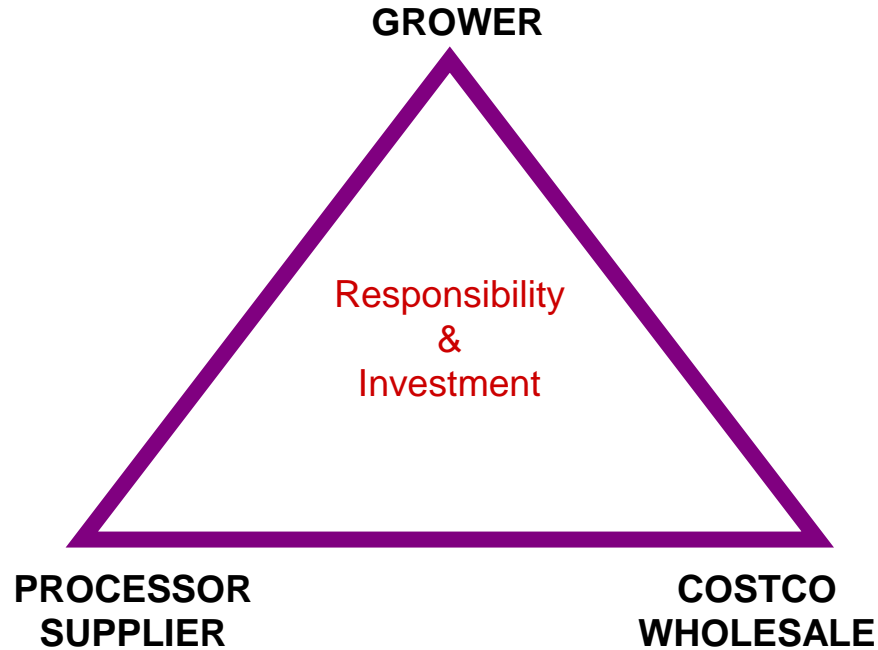
Tess Wilkins, Costco Wholesale



Costco's Approach to Responsible Buying



The Relationship



Costco / ApisM Program: 2014 - 2015

Costco PhD Scholar - \$150,000

- 1st MSU
- 2nd U of Minn

Tech Transfer Teams - \$585,000 + BeeKeeper Funds

- Real time national data made available electronically.
- Most robust data base globally
 - 96 Keepers
 - 491,000 hives
 - Reduced colony loss by 6% (29,500)
 - **\$7.4M in savings @ \$250/hive**

Long Term Stock Improvement (breeding program) - \$420,000

- World's 1st Honey Bee Germplasm Repository w/cryopreservation protocols & repository techniques
- New bee genetic material in the US in 90 years
- Recognized as a National Treasure by USDA



Traceability

Traceability is the ability to verify the history, location, or application of an item by means of **documented** recorded identification.

Verified by Third Party As Needed



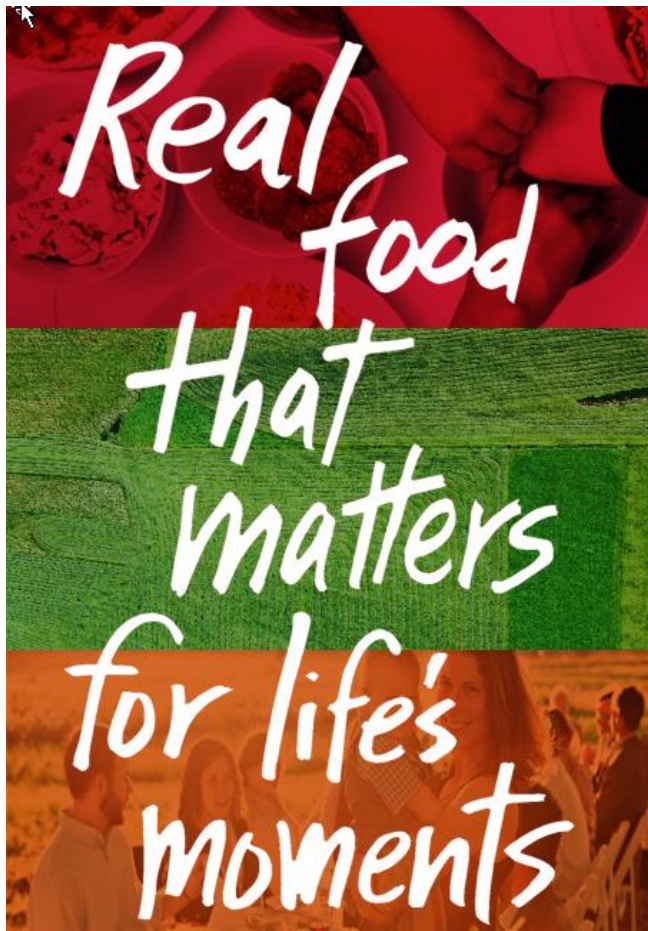
**Daniel Sonke,
Campbell Soup Company**

Diverse Portfolio



12 Brands with Sales Exceeding \$100 Million





Real
Food
That
Matters
for life's
moments

We make real food for real people. They trust us to provide food and drink that is good, honest, authentic, and flavorful—made from ingredients that are grown, prepared, cooked, or baked with care.

People love that our food fits their real lives, fuels their bodies, and feeds their souls.



Real food that matters for life's moments





**Craig Duerr,
Campos Brothers Farms**

ABC Sustainability and Almonds

“As farmers we consider ourselves the original stewards of the environment. Our livelihood depends on the sustainability of our land and our ability to harness and responsibly use all that Mother Nature provides”

Tony Campos

*As with Food Safety, documentation.....



A close-up photograph of a glass jar filled with almonds. In the foreground, a small white dish contains a dollop of almond butter. The background is a warm, golden-yellow color.

Questions?