Sustainability and Food Companies
The evolving world and the need for a practical approach
Introduction

- **Dan Sonke, DPM**
  - B.A. Environmental Studies, 1994
  - Doctorate of Plant Medicine, 2005
  - 19 years working in international and sustainable agriculture programs
    - California Almond Sustainability Program
    - Oregon Hazelnut Sustainability Program
    - Specialty Crop Sustainability Template
    - California Sustainable Winegrowing Alliance
    - Stewardship Index for Specialty Crops
    - Florida Integrated Pest Management Program
- **Family almond farm near Ripon, California**
Introduction

- **Manager, Ag Sustainability for Campbell:**
  - Tomato ingredient program in California
  - The Sustainability Consortium/Wal-Mart
  - Stewardship Index for Specialty Crops
  - Agriculture portion of Corporate Social Responsibility relationships with investors
Agenda

• Campbell approach to agriculture sustainability
  • Research opportunities in agriculture

• Campbell manufacturing sustainability
  • Research opportunities in manufacturing
Campbell Approach to Ag Sustainability
Global Ag Sustainability Drivers

• **Agriculture in a resource constrained world**
  - Nothing transforms the planet more than ag, and it’s crucial to our survival – as a company and as a planet

• **Agriculture is local but globally affected by:**
  - Increasing population and demand for higher quality food, new markets
  - Regulations on energy and emissions
  - Global distribution of key inputs – fertilizer, pesticides – and increasingly complex regulations
  - Volatility due to:
    - Water scarcity, labor limitations, land conversion limits
Customer and investor response

- **Investor groups and customers** (more than consumers) are asking questions about:
  - Irrigation
  - Pesticides
  - Pollinators & pesticides
  - Agriculture greenhouse gasses
  - Ag labor
  - Biodiversity

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![Poll Results](image)

**Reader Poll: What area of sustainability prompts the most questions for you?**

- **Agriculture**: 25.2%
- **All of the above**: 22.0%
- **Energy**: 20%
- **Sourcing**: 11.4%
- **Waste**: 11.4%
- **Seafood**: 5.77%

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**Wal-Mart Sustainability Questions**

- **KPI 1, 2**:
- **KPI 3, 4, 6, 7, 8, 9, 10, 11, 12**:
- **KPI 13, 14**:
- **KPI 15 (transportation)**
- **KPI 16**:

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**Majority of Wal-Mart sustainability survey focused on agriculture**

**Not manufacturing, transportation, etc.**

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**Focus Forward**
The Campbell Ag Sustainability Program was launched in 2012 and focuses on tomatoes and other vegetables - iconic crops for our iconic and innovative products.

- Manager of Ag Sustainability Programs hired Aug 2011
- Campbell’s first formal stakeholder survey for a sustainability program was used to identify priorities with customers, investors, farmers, and environmentalists.
Ag Sustainability Priorities

- Campbell Ag Sustainability focuses on 5 priority areas selected by our stakeholders:
  - Water use
  - Fertilizer use
  - Greenhouse gasses
  - Soil quality
  - Pesticides

- Goals: by 2020…
  - Reduce water use per unit of ingredient by 20%.
  - Reduce nitrogen applied per lb of ingredient by 10%.
  - Reduce GHGs per lb of ingredient by 20%.
Telling our Agriculture Story

• **Campbell canned tomatoes as early as 1869**
  - Tomato soup first made in 1897
  - 1947 - started processing tomatoes in California; some families still growing for us 65 years later

• **All 50 contracted farms are family owned**
  - Many in 2\textsuperscript{nd} or 3\textsuperscript{rd} generation with Campbell
  - 2012 – ave distance field to plant was 38 miles

• **The company has won several awards for reducing vegetable pesticide use**
  - Campbell has ongoing research projects on water, pests, fertilizer optimization with tomato farmers
Tomato data model

• In 2013, Campbell tomato field staff worked with 50 tomato farms to get data from 449 tomato fields
How are we doing?

• **In 2012:**
  - It took more than 9 gallons of water just to grow a pound of raw tomatoes
  - Drip irrigated fields did better
    • 28% less water than furrow
  - But only 39% of Campbell tomato acres were on drip in 2012, compared to 60% statewide

• **In 2013:**
  - Our water use was essentially flat, in a drought year we actually expected it to go up
  - Again, drip was more efficient
    • 34% lower water use
  - However, adoption of drip irrigation did not go up as much as expected
    • 42% of harvested acres in 2013
  - With the record drought, access to government funding for drip installation is increasing
Nitrogen

• **Nitrogen fertilizer**
  - Is necessary for productive farms
  - But also is a key non-point source pollutant in rivers and lakes, &
  - Source of the key greenhouse gas in agriculture

• **In fertilizer use:**
  - Our farmers use nitrogen fertilizer in line with state average – 185 lb/Acre
  - Nitrogen use efficiency might be a better analysis
    - A ton of tomatoes contain 3-4 lb N & more N is needed for vine growth
    - 2013 Campbell growers averaged 4.43 lb N/ton
  - We are tracking new nitrogen use guidelines in development by state government as potential tools for further efficiency
Identifying Opportunities

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- Using program to identify best practices
  - Farmers who use evapotranspiration data to plan when and how much to irrigate clearly reduced water use
Moving the needle – motivating farmer adoption

- Peer pressure - use data feedback in the form of custom reports and educational newsletters
  - Compare grower results to peers and provide access to additional knowledge
Beyond tomatoes

- The Sustainability Consortium - Walmart
  - Commodity mapping project
    - Phase 1 – map biodiversity hotspots
    - Phase 2 – map water supply risks
    - Major and now minor commodities
  - Proposing top 10 ingredients analysis
    - Also look at alternate scenarios
      - E.g. water risk of tomato supply in CA vs Italy
“Trillion $ Selfie”

• 5 CPG CEOs join in committing to Walmart to reduce GHG in agriculture
  • Walmart sees this as sustainability and cost opportunity
  • Agriculture GHGs dwarf our manufacturing GHGs, but are tied to critical fertilizer use

CEO CORNER
May 05, 2014

Ensuring a Sustainable Food Supply

I’m pleased to tell you that we are expanding our strong commitment to sustainable food production. In a collaborative partnership with Walmart, Campbell joined other food and beverage companies such as PepsiCo, General Mills and Kellogg in signing pledges last week to drive sustainable agriculture – see our CEO selfie (right).

At the invitation of Walmart President & CEO Doug McMillon, I had the pleasure of announcing Campbell’s commitment at Walmart’s inaugural Sustainable Product Expo in Bentonville, Arkansas.

I’m proud to say that Campbell set three important goals. We committed to:
• Reducing greenhouse gas emissions and water use by 20% per tonne of food for our five key agricultural ingredients: tomatoes, carrots, celery, potatoes and jalapeños.
• Working with our peer companies, growers, suppliers and customers to help achieve zero net deforestation by 2020.
• Preserving rain forests by sourcing our palm oil needs from certified sustainable sources by 2015.
Ag Sustainability Research Opportunities

1. **Focus!**
   - We have plenty of information about best practices
   - We need help determining 3-5 most effective things we can measure and track progress against
   - Getting consensus with science support is a priority

2. **Traditional agronomy (with a twist?)**
   - Accurate nutrient management recommendations for specialty crops
     - with a focus on efficiency and profit rather than simply max yields
   - Current fertigation/irrigation recommendations
   - IPM for invasive species
Ag Sustainability Research Opportunities

3. **Snake oil/microbiology research**
   - Too many microbe/humic acid/soil amendment products being pushed on ag (and processors) as the Next Big Thing in sustainability
   - Little research to give thumbs up or down

4. **Biodiversity & labor metrics**
   - Metrics to measure
   - Economic practices

5. **Use our programs for research?**
   - We’re collecting data – perhaps it’s useful?
   - E.g. average water and fertilizer use – rarely published
6. Technology

- Implementation rather than development?
- Integration and promotion of:
  - irrigation sensors
  - satellite tech
  - rapid testing methods
  - Big Data techniques for relatively small ag communities
Manufacturing Sustainability at Campbell
First lightweighted product?

• **1897 - Condensed Soup**
  - Nephew of Campbell President invents condensed soup
  - From 32 oz -> 10.5 oz
  - Price reduction $0.34 -> $0.10
  - 100+ years before detergent followed suit
Recognition of Campbell’s Leadership in Sustainability

- **Dow Jones Sustainability Indexes** – 4 years running
  - Bronze Class in 2013

- **2012 US EPA Climate Leaders Award** for excellence in GHG management and reductions

- **Best Corporate Citizen in Russell 1000**

- **The Global 100 (Most Sustainable Corporations)**
  - Named to list in 2013; only U.S. food company

- **MacLean’s Social Responsibility List; Maplecroft Climate Innovation Leaders Index; MSCI Sustainability EFT; STOXX ESG Leadership Index**
Drivers

• **Cost & efficiency!**
  - Realization that energy & waste costs are manageable
  - Increasing costs of management wastewater
  - Packaging lightweighting

• **Social responsibility**
  - As mentioned – investor & customer driven

• **Risk assessment**
  - Desire to be in business another 145 years
  - Identify potential risks to supply or sales

• **Regulations**
  - AB32 in California
  - Increasing energy costs from regulation
  - Favorable subsidies of renewable energy
  - Water quality discharge requirements
  - Etc.

• **Consumer perception**
  - Small, but growing driver
Campbell Soup Company
Global Greenhouse Gas (GHG) Emissions
(Tonnes CO$_{2e}$/Tonne of product produced)

20.3% less GHG emissions per tonne of product produced vs. baseline and 4.4% less F13 vs. F12
Campbell Soup Company
Global Water Use
(m³/Tonne of product produced)

Campbell Fiscal Years


Global Water Use (m³/Tonne of product produced)

20.7% less water per tonne of product produced vs. baseline and 3.3% less F13 vs. F12!
Solar Panel Systems at Campbell Locations

10 MW – Napoleon, OH

100 KW – Paris, TX

54 Panels – Toronto, Canada
BioGas Plant began accepting organic material from Napoleon during the last week of August and began generating electricity for the beverage plant in December. Organic material now being diverted from Henry County landfill.
Water Risk Assessment

Projected Site Distribution (Watershed)
Annual Renewable Water Supply per Person (WRI 2025)

- > 4,000: 13 sites
- 1,700 - 4,000: 10 sites
- 1,000 - 1,700: 5 sites
- 500 - 1,000: 2 sites
- < 500: 3 sites
- No Data: 1 site

m3/person/year
Just Peachy Salsa

Problem:
- 800,000 lbs of fresh NJ peaches sent to landfill
- Cost to farmers to dispose of good fruit
- Food Bank of South Jersey struggling to feed 175K residents

Solution: Campbell ingenuity + Culinary expertise + sustainability mindset + volunteer commitment = Just Peachy Salsa
- 42,000 jars of Just Peachy salsa produced over 4 manufacturing days - 8,000 jars have been sold
- 200+ employees volunteered to hand-label the jars
- Media coverage - 27 print articles and nationwide coverage by the AP
- Available at 21 locations locally, including farmer’s markets, restaurants and select ShopRite stores.
- Potential to save farmers $30,000 and generate $100,000 for the Food Bank
Energy and water focus

- **Dixon given “Big Check” award**
  - $188,088.00 utility rebates for
    - Steam insulation & improvements
    - LED exterior lighting
    - Compressed air leak repairs
    - Variable frequency drive (VFD) air compressor
  - Annual savings of 162,531 Therms and 419,258.0 kWh
  - More to come at both plants

- **Stockton water conservation**
  - 5% water use reduction year over year
  - Several projects saved $118,000 in gas and electricity over season
  - LED lighting going in this spring
California – Tomato Processing

- **2012/13 Water Energy Nexus project**
  - Tracking energy & water use intersections
  - From well to discharge
  - Analyze efficiency of each point
  - Much more than a simple “audit”
  - Very useful for identifying opportunities to improve

- **Example learning**
  - 37% of electricity use in plant is to move water around
  - Potential for improving efficiency of both water and energy use, especially around steam

- **“Tomato water”**
  - Potentially reusable water but with heat and low level organics
  - Need economic ways to reuse heat and remove organics
Processing byproducts

- **Tomato peels & seeds**
  - Currently utilized for pet food (4+M tons)
  - Higher and better use? Food grade fiber? Nutraceuticals?
- **Stems, damaged fruit, etc.**
  - Slight value as animal feed
  - Suited for digestion?
- **Dirty water**
  - High in organics, but also sediment from field
  - Biodigesters work for year-round plants, but not seasonal ones
- **Seasonal production is a limiting factor**
Other University Opportunities

• **GMO science**
  • How do we communicate the strengths and weaknesses of GMO tech to a scientifically illiterate populace (many of whom are college educated)?

• **BPA alternatives**
  • A food safety additive for canned products, but increasingly avoided by consumers
  • Tomato skin source?
Q&A

When heated the contents of this can are ready for use.

This soup is made from the celebrated "Beefsteak Tomato"
and is prepared only by the
Joseph Campbell Preserve Co.

Campbell's Beefsteak Tomato Soup

Focus Forward
Conservation Action Project - Ohio

- **2008 Campbell signs agreement with Ohio EPA in lieu of fine**
  - $50,000/year for 10 years, investing in upstream nitrate management projects on farms
  - wetlands, cover crops and controlled drainage projects in Lake Erie watershed

- **Has become a cutting edge project**
  - Implementation of water quality best practices
  - Utilization of farm land to offer “ecosystem services”
    - Ecosystem services – provision of clean water, air, wildlife benefits, etc. – an area of significant interest to USDA and EPA
Conservation Action Project - Ohio

• **Wetland Establishment**
  - Landowners participating – 2
  - Acres established – 31
  - Cost-share expended - $20,000

• **Cover Crops**
  - Landowners participating - 60
  - Acres established – 3,000 X 3 Years
  - Cost-share expended - $105,000

• **Controlled Drainage**
  - Landowners participating - 9
  - Acres established - 230
  - Cost-share expended - $85,000
Conservation Action Project - Ohio

- **Nitrogen Reduction**
  - 69.25 tons of nitrogen prevented from entering the Maumee River and Lake Erie Watershed