Journal of Extension
www.joe.org

December 2015
Volume 53
Number 6
Article # 6TOT10
Tools of the Trade

Opportunities and Best Practices to Support Sustainable Production for Small Growers and Post-Harvest Processors in Southern California

Abstract

This article describes current practices and needs associated with water and gas conservation among Southern California greenhouse growers, Post-Harvest Processors (PHPs), and agricultural associations. Two communication forums were held with the goal of educating the local gas company and small growers and PHPs on the most compelling needs and best practices to support sustainability while improving profit. While some growers and PHPs have made significant investment in energy and water conservation advanced technologies, all participants expressed the desire to work with local utilities towards greater water and energy conservation opportunities that are customized to specific needs.

Fissore Cinzia
Assistant Professor
Department of Biology and Environmental Science
Whittier College
Whittier, California
cfissore@whittier.edu

Duran Daniel F.
Principal, Energized Solutions
Associate Professor
Department of Business and Administration
Whittier College
Whittier, California
dduran@whittier.edu

Russell Robert
Associate Director
Navigant Consulting
Chicago, Illinois
Robert.Russell@navigant.com

Background

California represents the top U.S. producer of agricultural products, generating roughly $37.5 billion (Cornett, 2013), with greenhouse, floriculture and nurseries accounting for $3.8 billion (California Statistical Review, 2009). In 2010, greenhouses and nurseries represented approximately 8.3% of total energy sales within the agriculture sector, with the floriculture sector alone representing 35% of all agricultural energy use, mostly as natural gas (Navigant Consulting, 2013). Concerns over long-term sustainability of irrigated agriculture in arid regions are growing (Wallace, 2000; Schoups et al., 2005; Khan & Hanjira, 2008), and technologies are developed to implement water and energy conservation in greenhouse production systems (Pardossi, Tognoni, & Incrocci, 2004), which are of special concern. For energy providers, growers and post-harvest processing (PHP) in Southern California represent a well-defined sector with unique needs and requirements, as emerged from a large-scale interview-based study conducted by Navigant Consulting, Inc. in 2012-2013 (Navigant Consulting, 2013).

Objective

This article reports on a study of Southern California small growers' and PHPs' attitudes and perceptions concerning best practices (BP) in gas and water usage and their relationships with energy providers and their Ag segment peers.

Methods

Representatives of the California Sustainability Alliance and faculty from Whittier College organized two separate 1-day sustainability forums, one on November 6th, 2013, and the second on August 21st, 2014. The forums targeted local growers in the Southern California coastal region and growers and PHPs from the Central Valley, all customers of the same energy utility. The 14 participants of the 2013 forum represented 12 growers in the floriculture, nursery, and horticulture sectors. The 27 participants of the 2014 forum included 18 growers and PHPs, five PHP associations, and four SCG account executives and CSU-Fresno speakers. Both workshop-style forums opened with BP presentations followed by a discussion of best methods to conserve gas and water, and potential improvements, with the goal to assess the current level of acceptance of energy efficient practices among growers and PHPs, and to provide growers a platform to share their BP.

The second half of the workshops focused on pre-determined discussion questions administered to small groups. The goal of this second portion was to identify growers' pressing concerns regarding the adoption or implementation of best management practices to conserve water and gas. Some of the questions included the following.

1. What does "sustainability" mean to you as a grower or PHP?

2. What are the biggest issues facing greenhouses and nurseries in Southern California related to energy use?

3. What current programs do provide the most value for your operation and what could be done to make those programs better?

4. What new resources, programs, or assistance would help you most?

5. What new energy-related programs and services would benefit your operation in the next few years?

6. Would you be willing to work with the local utilities to pilot a new program or service or demonstrate a new technology in your operation if the utilities provided financial and technical support?

Participants were also administered an exit survey that had the goal to evaluate their overall impressions concerning the usefulness of the forum.

Findings and Interpretations

All participants claimed to include sustainability in their management practices and emphasized how sustainable practices to them correspond to maximization of resources, in particular water and power, which consequently translates in larger profit. Two of the growers had implemented cogeneration systems that were planned with and received incentives from the local utility company. One grower shared his approach to maximizing water recycling and reuse systems that were developed to help address water shortages due to the continuing drought in the area and the expense associated with drilling deeper to tap the local aquifer. Participants were uniformly aware of the consumers' increasing demand for sustainable products and unanimously they pointed at water demands, use, and recycling as main driver of energy-related costs.

Some of the growers and PHPs noted that high-efficiency technologies exist in Europe that the local utilities support through incentives and demonstration projects. These technologies include heat exchangers, micro-climate control, and advanced drip irrigation systems. Several growers lamented the lack of specific programs that take into account the individual, precarious, and quickly changing nature of growers' needs (e.g., major energy needs only during part of the year, need to quickly respond to weather events and damages).

Eighty-three percent of the growers expressed intention to implement some of their practices in the next 5 years to improve sustainability. However, major roadblocks to implementations were identified as well as the need for specific support (Table 1). Factors that hinder California small growers are not uncommon in the agricultural sector. A study conducted in Utah among farmers and ranchers pointed at high initial investment and maintenance costs as major limitations to implementation practices (Drost, Long, Miller, & Campbell, 1996). Similarly to our study, cattle ranchers lamented lack of support and need for more streamlined procedures to facilitate adoption of conservation practices (Drost, Long, Miller, & Campbell, 1996).

Table 1.

Summary of Most Desired Near-Future Implementations and Main Obstacles Encountered by Growers and PHPs to Their Applications

Desired implementation	**Roadblock to implementation**	**Desired support**
• Water recycling	• Lack of financing	• More streamlined application and disbursement processes
• High efficiency boilers, solar/wind water heating • More field based support	• Long ROI on equipment projects • Lack of time to follow updates • Too many	• Help from the gas company with calculations, applications, audits

	regulatory agencies	

Growers and PHPs place great value in rebates and incentives on energy efficiency products and on streamlined application process. Yet both groups called for more support in designing, permitting, and financing cogeneration plants, establishment of alternative energy sources, and water recycling (Table 2). Participants pointed at the need for improved and more advanced water conservation programs and longer natural gas pricing options that would allow for better financial planning. Growers value cooperation with the gas company, and 92% of the 2103 participants and 100% of the 2014 participants expressed interest in working with the gas company to pilot new programs that would benefit the sector.

Table 2.

Opportunities for Interactions Between Growers and PHPs and their Utilities (Listed in Order of Importance)

Engagement opportunities	Specific examples
More contact with local utilities	• Assigned gas company account executives • Continuous presence at meetings and events • Support with operational field reviews • Informational material on best practices focused on specific needs • Dedicated call-in line for immediate support • Field based education, demonstrations
Identification of specific technologies	• Advanced water conservation for irrigation and water filtration and treatment • VDF applications for operating systems • Energy efficient boiler and solar systems • Hydroponic-specific implementation systems • Financial viability and support of cogeneration systems • Labor-saving automated technologies

Development and support of alternative energy efficiency sources	• Simplified and streamlined application processes • Support with financial analyses on investments • Targeted educational and informational sessions
Long term natural gas tariffs	• Long-term procurement options
Facilitation of conversation with regulatory agencies	*Beyond energy efficiency programming purview. Potential involvement as mediator with other agencies.*

Conclusions

California growers and PHPs fit a very important niche in the U.S. agricultural system. Yet their survival and competitive edge are challenged by high-energy costs and water scarcity. Sustainability is at the core of the production system, and optimal use of resources is key to maintain yield and reduce costs, leading to long-term profitability. The forums showed that heterogeneity among growers is key in developing sustainable plans. There is the need for gas and water providers to create targeted programs and solution that the individual grower can relate to.

Acknowledgements

Research funding for the workshop and study reported here was provided by The California Sustainability Alliance. Program Managers include Navigant Consulting.

References

Cornett, R. (2013). What happens if US loses California food production? Western Farm Press. Retrieved from: http://westernfarmpress.com/tree-nuts/what-happens-if-us-loses-california-food-production

Drost, D., Long, G., Miller, B., & Campbell, W. (1996). Barriers to adopting sustainable agricultural practices. Journal of Extension [On-line], 34(6) Article 6FEA1. Available at: http://www.joe.org/joe/1996december/a1.php

Khan, S., & Hanjra, M. A. (2009). Footprints of water and energy inputs in food production – Global perspectives. Food Policy 34 (2):130–140. Retrieved from: www.sciencedirect.com/science/article/pii/S0306919208000729

Navigant Consulting (2013). Market Characterization Report. For 2010-2012 Statewide Agricultural Energy Efficiency Potential and Market Characterization Study. FINAL REPORT. Retrieved from:

http://www.calmac.org/publications/CA_Ag_Mrkt_Characterization_Final_5-13-13.pdf

Pardossi, A., Tognoni, F., & Incrocci, L. (2004). Mediterranean greenhouse technology. Chronica Horticulurae, 44: 28-35. Retrieved from: http://ag.arizona.edu/ceac/sites/ag.arizona.edu.ceac/files/Mediterranean%20Greenhouse%20Technology.pdf

Schoups, G., Hopmans, J. W., Young, C.A ., Vrugt, J. A., Wallender, W.W., Tanji, K. K., & Panday, S. (2005). Sustainability of irrigated agriculture in the San Joaquin Valley, California. PNAS 102 (43): 5352–15356. Retrieved from: http://www.pnas.org/content/102/43/15352

Various Authors. California Statistical Review (2009). California Agricultural Resource Directory 2010 – 2011. Retrieved from: www.cdfa.ca.gov

Wallace, J. S. (2000). Increasing agricultural water use efficiency to meet future food production. Agriculture, Ecosystems & Environment 82:105-119. Retrieved from: http://www.sciencedirect.com/science/article/pii/S0167880900002206
