Citrus Greening Solutions: Extension's Role in Florida, California, and Texas

Taylor K. Ruth
Graduate Student
University of Florida
P.O. Box 110540
310 Rolfs Hall
Gainesville, FL 32611
Phone: 352-273-2614
t.ruth@ufl.edu

Peyton N. Beattie
Graduate Student
University of Florida
P.O. Box 110540
408 Rolfs Hall
Phone: 352-273-2095
pbeattie@ufl.edu

Dr. Alexa J. Lamm
Assistant Professor
University of Florida
P.O. Box 112060
121E Bryant Hall
Phone: 352-392-6545
alamm@ufl.edu

Dr. Joy N. Rumble
Assistant Professor
University of Florida
P.O. Box 112060
121D Bryant Hall
Gainesville, FL 32611
Phone: 352-273-1663
jnrumble@ufl.edu

Introduction

Genetic engineering (GE) within the realm of food production is one of the most complicated and contentious topics extension agents have to discuss with the public (Martin, 2016). Florida, California, and Texas, the top three citrus producing states in the US (USDA, 2015), have been affected by citrus greening, a disease currently destroying the citrus industry (Ferris, 2015; UF/IFAS Citrus Extension, 2016). Florida and Texas have lost $236 million and $15 million in production value respectively since 2012 (USDA, 2015). One, and very possibly only, solution to citrus greening is the use of GE citrus trees (Satran, 2015). Yet consumers are not generally accepting of GE food products and may resist consuming the products of GE trees. Consumers in Florida, California and Texas may not recognize the importance of the citrus industry to their community and overlook the potential need for GE trees. Extension will likely have to facilitate difficult conversations in the future regarding the use of GE to save the citrus industry. Priority one of the national research agenda (Roberts, Harders, & Brashears, 2016) emphasizes the need for public understanding of issues facing the agricultural and natural resource industry. Extension will need to understand how residents of citrus producing states view the industry to develop effective outreach programs regarding citrus greening. Given this, the purpose of the study was to explore the importance of the citrus industry to residents of Florida, California, and Texas.

Conceptual Framework

Cognitive dissonance was used to guide this study. Festinger (1957) described cognitive dissonance as the feeling people have when presented with information that does not align with what they have already established as true. Inconsistency of information leads people to feel psychological discomfort. For extension agents, presenting information that reduces inconsistency is critical to meet the needs of clients (Everly, 1967). Increasing direct involvement of subjects in extension programs, through program planning or interactive activities, can also help shape attitudes (Whaples & Ryden, 1975), which could decrease cognitive discomfort (Hunt, 2004). Dissonance can also be relieved if messages promoting a product focus on desirable qualities for the consumer (Oshikawa, 1969), thus reducing their sense of discomfort with qualities they deem as undesirable.

Methods

Qualtrics, an online survey company, distributed a survey instrument to a panel 2,757 potential respondents 18 years or older in September 2015. Respondents did not necessarily live in citrus producing counties, but they were all residents of Florida, California, or Texas. Non-probability sampling methods were used and quotas were set to collect approximately equal number of respondents from each state. There were 1,541 usable responses (55.9% participation rate) after quotas and manipulation checks were passed. Seven questions within the instrument were analyzed for the purposes of this study. The questions were researcher-developed, and a panel of experts reviewed the survey prior to distribution to account for face and content validity. The first question asked if respondents purchased citrus; those who answered yes were asked how often they purchased citrus (never, less than once a month, at least once a month, at least 2-3 times a month, once a week or more). The final five questions asked about the importance of the citrus industry to the respondent and the respondent's community. The questions were measured

on a five-point Likert-type scale that ranged from 1 = *strongly disagree*, 2 = *disagree*, 3 = *neither agree nor disagree*, 4 = *agree*, to 5 = *strongly agree*. All data were analyzed in SPSS. Frequencies were reported for all questions.

Results

The majority of respondents (91.0%) indicated they purchased citrus in the past year. Of the 1,402 respondents that purchased citrus, 83.3% specified they purchased citrus at least once a month or more. Table 1 displays respondents' thoughts about the role citrus plays or does not play in their community.

Table 1

Effects of Citrus on Community

Statement	Strongly Disagree / Disagree (%)	Neither Agree nor Disagree (%)	Agree / Strongly Agree (%)
My community's history is strongly tied to the citrus industry	46.8	19.7	33.5
The citrus industry contributes to the character of my community	45.5	26.5	27.9
The citrus industry has helped put my community on the map	49.8	23.0	27.3
My community's economic development depends on the citrus industry	56.7	24.2	19.1
I am very attached to the citrus industry	56.5	26.9	16.7

Discussion and Recommendations

The majority of residents in citrus producing states buy citrus at least once a month. This finding illustrates that citrus is an important staple in the consumers' households. However, most respondents neither agreed nor disagreed or simply disagreed that the citrus industry affected their community. Cognitive dissonance is evident in that respondents live in citrus producing states and regularly purchase citrus, yet do not recognize the importance of citrus to their community (Festinger, 1957). Given this, consumers will likely not see the need for a solution to citrus greening or the potential use of GE citrus. There is a need for extension agents to facilitate discussions about citrus production and the effects of citrus greening on the industry to diminish the cognitive dissonance that consumers experience and to raise awareness about the disease. In order to reduce cognitive inconsistencies, extension agents should focus on contributions of citrus to their state specifically (Everly, 1967) and invite consumers to tour different citrus groves and interact with growers (Whaples & Ryden, 1975). Extension agents should also provide information to consumers about citrus greening and how the disease impacts the consumers' communities. Since citrus is not necessarily produced in all parts of the states studied, future research could compare the responses of non-citrus producing counties to citrus producing counties. Additional research should further evaluate cognitive dissonance related to citrus greening by exploring consumers' knowledge of the disease compared to their level of concern.

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