

Floridians' Perceptions of GMOs: GMOs and Florida Citrus¹

Nicole M. W. Dodds, Laura M. Gorham, and Joy N. Rumble²

This EDIS publication, focusing on Floridians' intent to purchase GMO citrus, is intended to help Extension faculty understand public perceptions regarding the use of genetic engineering to combat citrus greening. Extension faculty can use this understanding of public perceptions as they develop and deliver programming for clientele.

Introduction

Worldwide and in Florida, food-related issues such as food safety, food security, and use of new food technologies continue to be top concerns. Among the food-related issues are concerns about consuming the products from transgenic plants, often referred to as "GMOs" (Hallman et al. 2003).

Although the amount of GM foods grown worldwide has increased dramatically in the past 20 years, rising from 1.7 million hectares in 1996 to 175 million hectares in 2013 (International Service for the Acquisition of Agri-Biotech Applications 2014), the rate of agricultural biotechnology adoption to produce food will be influenced by public opinion. Genetically modified food, while well understood by science, is not widely understood by public audiences, and often leaves people skeptical and unsure whether they should be eating GMOs (Rumble and Leal 2014). Citrus greening is one of the most serious citrus diseases in the world (Florida Department of Agriculture and Consumer

Services 2013). Wherever the disease has appeared, citrus production has been compromised, with the loss of millions of trees (University of Florida 2014). The disease was found in south Florida in August 2005. Since then it has been found in commercial and residential sites in all Florida counties that have commercial citrus (University of Florida 2014). There is no cure for the disease once a tree is infected; within 12 years the infected trees decline and produce bitter, misshapen, unmarketable fruit (Louisiana State University Agricultural Center 2008). According to Harold Browning, COO of the Citrus Research and Development Foundation, "There aren't any citrus industries in the world that have encountered the disease and come up with a management system that allows them to continue to produce citrus in the presence of the disease long-term" (Satran 2013).

The threat that citrus greening poses to the citrus industry is very real, with many farmers succumbing to the disease and selling their land. Between 2004 and 2012, Florida land planted with citrus shrunk by almost one-third (Satran 2013). Citrus production dropped from 292 million boxes of fruit in 2004 to 171 million in 2012 (Satran 2013). The wholesale price of oranges has almost tripled in the same period. Predictions for the industry include a continued decline in production and increased costs of producing oranges. The entire industry hinges on the ability to

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2. Nicole M. W. Dodds, outreach & training coordinator / UF/IFAS Center for Public Issues Education; Laura M. Gorham, graduate assistant, Department of Agricultural Education and Communication; and Joy N. Rumble, assistant professor, Department of Agricultural Education and Communication, UF/IFAS Extension, Gainesville, FL 32611. The authors wish to thank Dr. Sebastian Galindo and Dr. Kevin Folta for their helpful suggestions on an earlier draft.

produce a threshold level to maintain packing houses, juice plants, and support facilities. Once production drops below that level, losses will only accelerate.

The citrus industry as well as federal and state governments have invested more than \$220 million into research on the disease (Putnam 2014). A University of Florida research team found a possible biochemical treatment for citrus greening in the lab setting. The new chemical treatment was successful in stopping the spread of the bacteria that causes citrus greening in 80 percent of the infected trees' shoots. Field experiments and testing are necessary and will reveal if this approach is viable for the industry (University of Florida 2014). Many scientists are confident that a long-term solution will be discovered within the next 15–20 years, but there are concerns that economic forces could ruin the industry in less time. Genetically engineering citrus trees is another approach in development to defeat the disease, save the citrus industry in Florida, and prevent juice from becoming scarcer and more expensive. Research is being conducted at the University of Florida, Texas A&M University, and Tuskegee University to develop transgenic trees resistant to, or able to live with, the disease (Harmon 2013).

Given that genetic engineering could be a solution to this devastating disease, understanding public perceptions of GMO citrus could help Extension faculty develop programming to meet the needs of Floridians. Increasing the sustainability, profitability, and competitiveness of agricultural enterprises is a priority initiative in the UF/IFAS Florida Cooperative Extension Service's [2013–2023 Florida Extension Roadmap](#) (University of Florida Institute of Food and Agricultural Sciences Extension 2013). The role that Extension faculty play in helping the public understand new technologies such as genetic engineering and GMO crops is important and contributes to the success of both this initiative and viable agricultural production that continues to be sustainable and profitable.

This EDIS publication will help Extension faculty understand Florida residents' perceptions of and beliefs about GMO citrus and their intent to purchase GMO citrus and citrus products. This understanding can equip Extension faculty to more effectively communicate with and educate clientele about this topic so that they can make informed decisions.

Background

Since Floridians' opinions of food issues are important to the sustainability of the agricultural industry, the UF/

IFAS Center for Public Issues Education in Agriculture and Natural Resources (PIE Center) initiated a study to explore the attitudes, perceptions, and opinions of Floridians around food issues. In October 2013 an online survey was distributed to a representative sample of 827 Florida residents aged 18 and older using non-probability sampling; 510 completed responses were collected, for a participation rate of 61.7 percent (Rumble and Leal 2014). To ensure that respondents were representative of the 2010 U.S. Census, the data were weighted to balance their geographic location in the state, age, gender, and race (Kalton and Flores-Cervantes 2003; Odera and Lamm 2014, Roper and Lamm 2014). The survey included questions about GMOs replicated and adapted from Bredahl (2001).

Results

Scenario: Genetic modification as a solution to citrus greening

To examine beliefs on whether genetic modification should be used as a potential solution to citrus greening, respondents were asked to read the following statement about citrus greening and its impact on the industry:

A disease known as citrus greening is spreading quickly throughout the state of Florida. The disease affects the trees' uptake of nutrients, leaving the fruit sour and the tree malnourished. There is no cure for the disease, and pesticides have failed to stop the spread of the disease that eventually kills the tree. Research has been done to find a citrus tree resistant to the disease, but none has been found. Without a solution, this disease could lead to the demise of the Florida citrus industry. Genetic modification is a possible solution for saving the Florida citrus industry.

Respondents were given the statement "Genetic modification should be used to save citrus trees" and asked to indicate their level of agreement on a five-point scale (1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, 5 = Strongly agree). After reading this description, over half (52 percent) of respondents agreed or strongly agreed that genetic modification should be used to save citrus trees, while another 33 percent of the respondents felt neutral about the scenario (Figure 1).

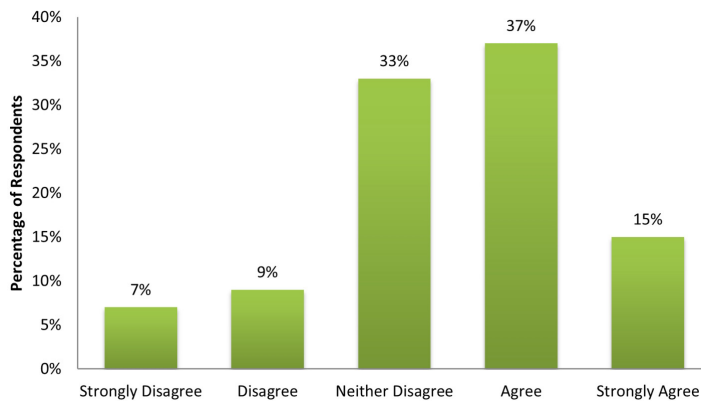


Figure 1. Responses to the statement “Genetic modification should be used to save citrus trees”

Willingness to purchase GMO citrus and citrus products

To examine their willingness to purchase GMO citrus and citrus products, respondents were given the statement “I would purchase Florida-grown, genetically modified, citrus fruit and juice” and asked to indicate their level of agreement on the same five-point scale. Forty-two percent of respondents agreed or strongly agreed they would purchase Florida-grown genetically modified citrus fruit and juice, while 32 percent felt neutral about their intent to purchase these products (Figure 2).

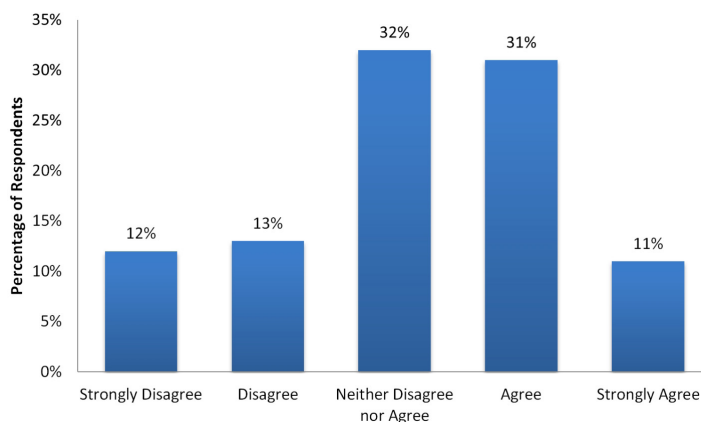


Figure 2. Responses to the statement “I would purchase Florida-grown, genetically modified, citrus fruit and juice.”

Recommendations

After being given a specific situation about citrus greening and an explanation of its impact on the industry, respondents had fairly positive feelings about genetic modification.

Floridians were able to relate to and had an emotional reaction toward the possibility of saving citrus trees with genetic modification. From these results, personal relevance seemed to play a role in Floridians’ decision-making process regarding genetic modification.

This research suggests that messages highlighting the facts and adding personal relevance about a specific situation can lead to a more accepting public. While Floridians’ perceptions of GMO use were more favorable in this case, almost one-third (32 percent and 33 percent, respectively) were still neutral about whether genetic modification should be used and if they would buy GMO citrus and juice. This suggests that if transgenic citrus does emerge as one of the solutions to citrus greening, the citrus industry will have to develop effective strategies to communicate and market citrus products.

IFAS researchers working on solutions to citrus greening should work closely with IFAS communications and social science researchers to ensure that the research is communicated in a manner that is transparent and relevant to Floridians. Additionally, researchers throughout IFAS should collaborate to ensure that the public is informed about new solutions to citrus greening. Without public awareness and acceptance, a new solution is not guaranteed to be successful in restoring the sustainability of the industry.

Extension faculty have a role to play in working with IFAS researchers as new technologies surrounding citrus greening are developed. In addition to communicating the technology to citrus producers and the broader industry, Extension faculty should also communicate about the technology to consumer clientele so that consumers are able to make informed decisions about the technology. Extension faculty should seek guidance from IFAS Communications when discussing these concepts with clientele to ensure a consistent message is communicated to residents throughout the state.

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