

Challenges and Barriers to Developing Commercial Beekeeping Education Programs in Florida

M. Benge¹, A. Vu²

Abstract

Honey bees are vital to Florida agriculture as they play an important role in pollinating a variety of the state's crops and the demand for honey bee pollination and bee-related products continues to increase as the need for more food increases. Cooperative Extension plays an important role in Florida's agricultural sector, yet many extension agents do not focus much time and attention on commercial beekeeper education. Using the program development model, we sought to understand the challenges and barriers of Florida agriculture extension agents to conducting commercial beekeeping programs. We conducted a focus group with the Honey Bee Extension Education Team to identify potential barriers and challenges. One major finding is that agriculture extension agents are using a variety of definitions and descriptions when classifying who a commercial beekeeper is. The major challenges that affect Florida Extension agents conducting commercial beekeeping programs are a lack of resources, little technical/subject matter knowledge and experience, lack of trust with commercial beekeepers, understanding clientele needs, and other agent job responsibilities take priority demands. Florida Extension needs to provide a strategic plan with specific goals, objectives, and training for agriculture extension agents to conduct commercial beekeeping programs.

Article History



Received: July 27, 2023

Accepted: December 1, 2023

Published: December 18, 2023

Keywords

extension; program development; planned behavior

-
1. Matt Benge, Associate Professor, University of Florida, PO Box 112060, Gainesville, FL 32610, mattbenge@ufl.edu,  <https://orcid.org/0000-0002-5358-3233>
 2. Amy Vu, State Specialized Program Extension Agent II, University of Florida, PO Box 110620, Gainesville, FL 32611, amy.vu@ufl.edu,  <https://orcid.org/0000-0001-7547-7282>

Introduction and Problem Statement

Agriculture plays a pivotal role in Florida's economy, as it is the second highest grossing economic industry in the state and utilizes 9.70 million acres of land for ranches and farms for agricultural production (United States Department of Agriculture, National Agriculture Statistics Service [USDA-NASS], 2019). Honey bees are vital to Florida agriculture, ranking third in the nation in number of colonies (United States Department of Agriculture, National Agriculture Statistics Service [USDA-NASS], 2020) and pollinating a variety of crops such as almonds, melons, blueberries, squash, cucurbits, and more (Florida Department of Agriculture & Consumer Services [FDACS], 2021). In recent years, demand for many pollinator-dependent crops has increased across the United States (U.S.), which has resulted in a demand for increased pollination services. Florida's Extension agents need to be prepared and equipped (Harder et al., 2010; Seevers et al., 1997) to work with and educate Florida's 520 commercial beekeepers (Calderone, 2012) to match the demand for pollinator services.

Many Florida Extension agents conduct educational programs for hobbyist (or backyard) honey beekeepers; however, many agents do not conduct commercial beekeeping programs (S. Mukhtar, personal communication, July 21, 2020). Historically, this has been the case all over the nation, with extension personnel focusing on hobbyist beekeepers and less so on commercial beekeepers. The Florida Department of Agriculture & Consumer Services (FDACS) categorizes backyard beekeepers as an individual who manages 0-40 colonies, sideliners are those with 41-100 colonies, and commercial beekeepers manage 101 colonies or more (Branden Stanford, personal communication, 2023). However, there is no consensus on what is considered a "commercial beekeeper" on a national or international scale or even within the beekeeping community in Florida, which can cause some confusion. While there are many reasons extension agents focus their programmatic efforts on hobbyist beekeepers, it is important to acknowledge the reason for little to no commercial beekeeping programs in Florida. Due to the importance honey bees contribute to the Florida, and to the U.S.' agriculture, it is critical to understand the barriers and challenges Florida Extension agents face to developing commercial beekeeping programs.

Theoretical and Conceptual Framework

Program development "is a process designed to bring about effective programming" and is a "system of interrelated parts, all of which work together to achieve defined goals" (Seevers et al., 1997, p. 102). The Program Development Model (PDM) is made up of three primary components: (a) program planning, (b) program design and implementation, and (c) program evaluation (Seevers et al., 1997). Program planning guides the formation of a program, such as identifying needs, setting program priorities, and developing goals and objectives. Within the program design and implementation component, extension agents create curriculum and presentation materials and identify and choose appropriate program delivery methods (i.e. field day, group workshop, webinar, etc.). Lastly, program evaluation refers to the planning and implementing of evaluation measures to ensure outcome were achieved (Diaz et al., 2019).

When linked together with thoughtful and intentional planning, these components provide the foundation for successful extension programming. However, a breakdown within one of the PDM processes can be a challenge for extension professionals to effectively educate their clientele (Boone et al., 2002).

Purpose

The purpose of this research was to understand the challenges and barriers of Florida agriculture extension agents to developing commercial beekeeping programs. The two research questions guiding this study were: (a) How do Florida agriculture extension agents describe commercial beekeeping? (b) What challenges do Florida agriculture extension agents face when developing commercial beekeeping programs?

Methods

A qualitative design utilizing focus groups was used to understand the challenges and barriers of Florida agriculture extension agents when conducting commercial beekeeping programs. Focus groups allow participants the opportunity to share opinions and engage in feedback with others and therefore promote discussion and deeper thought into an issue (Morgan, 1998). A focus group was conducted with members of the Honey Bee Extension Education Team (HBEET), which is a working group of 11 Florida Extension agents with the sole purpose to develop and conduct education programs for commercial beekeepers. Though the literature typically recommends three focus groups (Krueger & Casey, 2000), conducting one focus group with the HBEET members was appropriate because of their membership in this appointed working group and can speak on the challenges and barriers to commercial beekeeping programs.

A semi-structured moderator's guide was created by the researchers consisting of five questions to satisfy the research questions, such as "What is commercial beekeeping?" and "What challenges exist to conducting commercial beekeeping programs?" The interview guide was reviewed by a four-member panel for face and content validity (Morse et al., 2002). The study received approval from the Institutional Review Board (IRB) prior to being conducted, and each participant consented to participate in the study. Nine of the eleven HBEET members participated in the virtual focus group which lasted 47 minutes and was audio-recorded. The lead researcher served as the moderator for the focus group interview while the other researchers took observational notes as a form of secondary data collection that was also utilized for analysis (Merriam & Tisdell, 2016). Once the audio recording was transcribed verbatim, the data was analyzed using the constant comparative method where first the researchers analyzed and coded the data individually before comparing together (Krueger & Casey, 2000; Morgan, 1998).

The researchers utilized NVivo 12 qualitative software to organize, code, and analyze the data collected. The constant comparative method was used to reduce data into identifiable,

recurring themes (Lincoln & Guba, 1985). The researchers analyzed the data individually and then met to discuss emergent themes together, which was important in this study since one of the researchers did not have an extension background and acted as an external check to the other researchers with extension backgrounds.

Eisner (1991) stated the importance of establishing credibility within qualitative research “allows us to feel confident about our observations, interpretations, and conclusions” (p. 110). We first used member checking with four focus group participants both prior and after analyzing the data to ensure accuracy and understanding of the emergent themes. Second, we invited one of the moderator’s guide reviewers to peer debrief our emergent themes to ensure accuracy and application of the data. Third, thick and rich descriptions were used to ensure transferability of the findings.

Findings

Findings from Research Question One

Regarding the first research question, participants described commercial beekeeping in four different ways: (a) bee products and pollination services, (b) Florida definition of commercial beekeeping, (c) USDA definition of beekeeping, and (d) money. Many of the extension agents were uncertain about how they should classify commercial beekeepers and what specifications defined a commercial operation compared to a hobby operation which led to the use of multiple descriptions.

Bee Products and Pollination Services

Participants indicated a variety of bee product and pollination services that should be considered in the definition of commercial beekeeping. Tatiana explained that a commercial beekeeper is someone that provides pollinator services or sells bee-derived products. JK suggested that a beekeeping operation should be considered a product or service that comes from their bee business. Francisco provided a description of bee products and services he uses to define a commercial beekeeper:

I think that a commercial beekeeper operation should be a product or a service that comes from the bee industry. Those could be different things like honey production, could be the sale of queens, could be the building of the housing for the bee, could be a pollinator of acres. So, I think that any product or service related to the honey bee industry should be considered a commercial operation.

Florida Definition of Commercial Beekeeping

Florida defines a commercial beekeeper as someone that has a minimum of 101 colonies (B. Stanford, personal communication, 2023). Some of the participating extension agents were not comfortable with this definition due to it not involving a monetary aspect and that the definition excluded other pieces of beekeeping that can also count individuals as beekeepers that do not have hives. Sarah explained she does not use Florida’s definition for commercial beekeeping, and Bonnie followed suit by stating, “I was never comfortable with that Florida

definition for extension work.” Jessica explained that she came from a small farm background and believed a beekeeper should not be defined by a minimum number of colonies. Teresa expanded on what Jessica mentioned by stating:

I'm a cheerleader for Extension, so if we are talking about large farms and small farms, we could probably think the same way about beekeepers that those hundred or more hives will be a large bee farm and others who may have, you know, 5-10, or maybe less, but they are making some money. From that [they] could be considered maybe like small bee farms.

USDA Definition of Commercial Beekeeping

The participating agents all utilized the USDA definition of a farm to describe a commercial beekeeping operation which states that if beekeepers made more than one thousand dollars it is considered a commercial operation. JK explained he used the \$1,000 definition of a farm because “it makes sense.” Jessica supported JK’s comment by stating, “basically, anybody that makes money off of a beekeeping like \$1,000 or more, I consider that commercial.”

Money

Sarah, Jessica, Bonnie, and Francisco agreed that if the beekeeping operation is trying to maximize their profit, it should be considered a commercial operation and not a hobby. Jessica stated that “if they’re aiming to make money from their beekeeping operation and they’re doing that, and they’re considering themselves a business, then, to me that’s commercial.” Sarah agreed with Jessica’s statement and said, “if there is some sort of exchange of money involved... that’s a commercial transaction and so they produce commercially.” JK added that using a “profit threshold [to be considered commercial] does not make sense.” Francisco stated that if a beekeeper is not making money off of their operation, then it is not sustainable and should be considered a hobbyist operation rather than a commercial operation.

Findings from Research Question Two

Regarding the second research question of understanding the challenges when implementing commercial beekeeping programs, five themes emerged: (a) agent’s lack of resources, (b) agent technical/subject matter knowledge and experience, (c) lack of trust with commercial beekeepers, (d) understanding clientele needs, and (e) other agent job responsibilities take priority demands.

Agent’s Lack of Resources

The participating agents felt they did not have the proper resources for beekeeping programs and they do not have access to house bees at their local offices due to safety concerns. They thought that this is one of the main reasons that agents lack resources when needing to understand clientele needs. Tatiana explained that they would like to have a bee program in their county, but a lot of extension offices lack the space and materials to conduct the proper programs. Additionally, Francisco stated, “not having the proper resources to be able to conduct programs decreases the agent’s experience with commercial beekeeping programs.”

Agent Technical/Subject Matter Knowledge and Experience

The extension participants felt they do not have enough knowledge experience with bees to understand beekeeping and educate others on the topic, as well as enough knowledge on bee products and pollination services. The participating agents understood the rules and regulations that beekeepers must abide by but often refer their commercial beekeepers to FDACS because they did not feel confident enough to provide information beyond the FDACS' website. Agents also felt they lacked major knowledge on the production scale of beekeeping and staying up to date with emerging techniques. Ray explained that he knows the basics of beekeeping but clarified, "I don't really have anything to probably offer them at this point; they know more about the subject than I do." Tatiana agreed with Ray and stated, "I think that another challenge is we don't have enough knowledge ourselves to teach at the commercial level; ask me about bugs and plants, but everything else goes over my head."

Lack of Trust with Commercial Beekeepers

Francisco and Tatiana explained that commercial beekeepers feel as if they are being neglected when compared to hobby-type beekeeping operations and that commercial beekeepers have lost trust in Extension due to the beekeeping information that is published through FDACS applying more to hobby beekeepers. Tatiana expressed her concern effectively by stating:

The commercial beekeepers feel left out, more or less, kind of like what happens with small organic farms versus the conventional farms that they feel like all the resources and research goes to the larger acreage of the big players. Now the commercial beekeepers feel like most of the beekeeping information coming from FDACS and extension efforts go towards hobbyist beekeepers so they don't have [trust] in Extension. And I think that's one of the barriers that we have. We need to have enough good relationships with at least a few beekeepers to get into the group and try to break that mentality of "we are not going to help you" or "what we have is not useful for you."

Understanding Clientele Needs

Sarah, Bonnie, Tatiana, and Jessica explained that they do not understand what commercial beekeepers' educational needs are, which impacted their ability and willingness to dive into the realm of commercial beekeeping education. Bonnie expressed a need for a needs assessment to be conducted on what commercial beekeepers need by stating, "we don't really know what they want. We need to do like focus groups...to figure out what they need and how we could use it to our advantage." Jessica echoed what the other agents were expressing and provided further:

I myself don't feel like I know enough about what they need, and therefore, what my role [would be] to fill the educational gap would be. And it seems like a lot of the issues that they are dealing with are kind of like outside of our educational realm.

Other Agent Job Responsibilities Take Priority Demands

Many of the participating agents expressed difficulty with dedicating time to focus on commercial beekeeping stakeholders due to the other demands of their job. Sarah expressed concern that the low number of recorded commercial beekeepers in her county makes it challenging to have specific educational programs, and the other programmatic demands and

high number of other commodity producers need her time and attention. Luke expressed a similar concern and that he must have at least ten clientele registered to conduct an educational program. Prior to her extension career, Sarah was an extension user and sometimes felt that “Extension doesn’t actually have the time for you and you’re actually not that important,” which is a concern for her, and she does not want commercial beekeepers to have that same perspective. Bonnie and Sarah recommended a collaborative regional approach to meet commercial beekeepers needs which would make it “easier to pull together enough expertise and enough participation to warrant a formalized educational program.”

Conclusions, Discussion, and Recommendations

Many of the Florida Extension agent participants indicated they did not feel comfortable with conducting commercial beekeeping programs because they did not know enough about both standard beekeeping knowledge and commercial beekeeping practices. Additionally, participants were not using a singular description to define and understand commercial beekeeping, adding to the narrative of not being knowledgeable and potentially misinformation about beekeeping. Participants recognized that each state and government agencies define commercial beekeeping differently from one another which is problematic when setting educational goals and objectives. The barriers the participants faced occurred in the planning and designing/implementing phases of the PDM framework (SeEVERS et al., 1997), suggesting extension agents might be having difficulty planning educational programs for an audience that is unknown and hard to reach.

We recommend that Florida agents work together with the Florida HBREL to identify what they define as commercial beekeeping. The Florida definition is any beekeeper who manages 101+ colonies (Branden Stanford, personal communication, 2023). Finding a common definition will help agents work together to know how to identify target audiences for programs (i.e. “who are the commercial beekeepers in my county?”). This may also set a standard for other extension programs around the nation. Additionally, some resources already exist to help Florida agriculture agents with conducting commercial beekeeping programs such as the commercial beekeepers needs assessment produced by Bammer et al. (2022)

Second, extension agents need to be technically competent to serve the needs of their clientele (Harder et al., 2010; SeEVERS et al., 1997). Regarding the PDM, many of the challenges and barriers fell within the program planning component, such as agents’ lack of information. Florida Extension needs to better prepare extension agents to conduct commercial beekeeping programs, provide in-service trainings, and hire agricultural extension agents with knowledge (Benge et al., 2011) of beekeeping and commercial beekeeping practices. UF/IFAS HBREL provides a University of Florida Master Beekeeper Program that agents can participate in to develop a baseline understanding of beekeeping practices. Once the basics of beekeeping are met (i.e. knowing beekeeping terminology, understanding honey bee pest and diseases, etc.), Florida Extension should invite commercial beekeepers and other stakeholders within the beekeeping industry to have a discussion related to their challenges and needs. Visiting

commercial beekeeping operations, collaborating with district apiary inspectors, regularly attending county and state honey bee association meetings, and being in contact with local beekeepers association presidents can help agents identify needs in their counties and districts while building connections with beekeepers. Agents with a willingness to learn about beekeepers' practices, needs, challenges, and concerns may help build trust between one another, and through time, beekeepers may identify agents as a resource.

Florida Extension must better prepare and offer trainings (formal and nonformal) to extension agents interested in working with commercial beekeepers, so that they are equipped and prepared to create a successful program. Supporting the commercial beekeeping industry will ultimately impact the high-quality fruits, vegetables, nuts, and other agricultural crops that are dependent on beekeepers throughout the nation. Creating a baseline for successful beekeeping programs in Florida can provide an example for other states around the U.S. and beyond.

Acknowledgements

M. Benge - formal analysis, investigation, methodology, resources, writing-original draft; **A. Vu** - formal analysis, investigation, writing-original draft.

References

- Bammer, M., Benge, M., & Warner, L. A. (2022). Identifying and assessing the needs of Florida commercial beekeepers using nominal group technique. *Journal of Agricultural Education*, 63(1), 80-97. <https://doi.org/10.5032/jae.2022.01080>
- Benge, M., Harder, A., & Carter, H. (2011). Necessary pre-entry competencies as perceived by Florida Extension agents. *Journal of Extension*, 49(5), Article 3. <https://doi.org/10.34068/joe.49.05.03>
- Boone, E. J., Safrit, R. D., & Jones, J. (2002). *Developing programs in adult education: A conceptual programming model* (2nd ed.). Waveland Press.
- Calderone, N. W. (2012). Insect pollinated crops, insect pollinators and US agriculture: Trend analysis of aggregate data for the period 1992–2009. *PLoS ONE*, 7(5). <https://doi.org/10.1371/journal.pone.0037235>
- Diaz, J., Chaudhary, A. K., Jayaratne, K. S. U., & Warner, L. A. (2019). Program evaluation challenges and obstacles faced by new extension agents: Implications for capacity building. *Journal of Extension*, 57(4), Article 26. <https://doi.org/10.34068/joe.57.04.26>

- Eisner, E. W. (1991). *The enlightened eye. Qualitative inquiry and the enhancement of educational practice*. Macmillan.
- Florida Department of Agriculture & Consumer Services. (2021). *Florida agriculture overview and statistics*. <https://www.fdacs.gov/Agriculture-Industry/Florida-Agriculture-Overview-and-Statistics>
- Harder, A., Place, N. T., & Scheer, S. D. (2010). Towards a competency-based extension education curriculum: A Delphi study. *Journal of Agricultural Education*, 51(3), 44–52. <https://doi.org/10.5032/jae.2010.03044>
- Krueger, R. A., & Casey, M. A. (2000). *Focus groups: A practical guide for applied research* (3rd ed.). SAGE.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
- Merriam, S., & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). John Wiley and Sons.
- Morgan, D. L. (1998). Planning focus groups. In D. Morgan, & R. Krueger, (Eds.), *The focus group kit*. (Vol. 2). Sage.
- Morse, J. M., Barrett, M., Mayan, M., Olson, K., & Spiers, J. (2002). Verification strategies for establishing reliability and validity in qualitative research. *International Journal of Qualitative Methods*, 1(2), 13-22. <https://doi.org/10.1177%2F160940690200100202>
- Seevers, B., Graham, D., Gamon, J., & Conklin, N. (1997). *Education through Cooperative Extension*. Delmar Publications.
- United States Department of Agriculture, National Agricultural Statistics Service. (2019). *Florida agriculture overview*. https://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Annual_Statistical_Bulletin/2019/A1thru10Over-2019.pdf
- United States Department of Agriculture, National Agricultural Statistics Service. (2020). *Other agriculture*. https://www.nass.usda.gov/Statistics_by_State/Florida/Publications/Annual_Statistical_Bulletin/2020/F1thru5-2020.pdf

© 2023 by authors. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).