

Exploratory Research

Questions to Consider

- Who is selling/renting out the bees?
 - Is it individual beekeepers or commercial bee organizations?
- Who is transporting the bees?
 - Is it a shipping company?
 - Is it individual truckers?
- How are beekeepers finding customers to rent their bees to?
 - Are there already platforms that do this?
- How are beekeepers finding transport services to deliver the bees?
- Where are beekeepers in Georgia sending their bees?
 - What makes California almond farms desirable?

<i>Link</i>	<i>Summary</i>
Cost of Trucking Bees	Webpage is great for a synopsis for how much it costs to ship bees.
https://beeinformed.org/2018/02/08/the-long-haul/	Insight into the process of shipping bees and the limitations truckers have shipping bees.
2022 Almond Pollination prices	An analysis of prices per hive from 2019-2022 for almond growers in California.
https://jalopnik.com/that-big-rig-youre-passing-might-be-full-of-bees-1834383949	Article focused on the trucking business and the transfer of bees.
https://extension.uga.edu/publications/detail.html?number=B1045&title=Honey%20Bees%20and%20Beekeeping PDF version	Good general overview of beekeeping by Keith himself.
How much does it cost for beekeepers? How do they benefit?	Article on cost to send bees for pollination. This one outlines that beekeepers send their bees to pollinate almonds even if they lose money because the bees come back with a head start for the season with a lot of eggs.
https://www.agweek.com/business/pollinating-as-important-as-honey-for-modern-beekeepe	Interview with a bee company. Insight into the pollinator market and how it plays into

r-income	beekeeper profits.
Blueberries in GA	Harvested in Georgia late-May to mid-July
https://beeinformed.org/	Holy Grail of Bee Knowledge
Honey Bees, Almonds, and Colony Mortality: An Economic Simulation of the U.S. Pollination Market.	Motivated by increasing threats to pollinator health and increasing pollination contract fees, we develop a simulation model for the honey bee pollination and honey production market. The model, calibrated using 2015 and 2016 data, incorporates population dynamics, 15 crops, and transportation of managed honey bee colonies across several states.
Honey Bees on the Move: From Pollination to Honey Production and Back	Using data from a USDA survey of beekeepers, this report quantifies honey bee colony movements over the four seasons and provides a basis for understanding how the transport of honey bee colonies affects pollination services, honey production, and the loss of colonies.
HONEY BEE POLLINATION MARKETS AND THE INTERNALIZATION OF RECIPROCAL BENEFITS	In the current paper we theoretically and empirically analyze the determinants of pollination fees with a much larger and richer data set than has been studied before

Interview

- **Could you tell us about your app?**
 - What is it for?
 - Blueberries bloom in perfect competition with California almonds. This app helps blueberry growers and beekeepers establish connections.
 - Who do you see using this app?
 - Very detailed and specific stakeholder group
 - Commercial beekeepers/ Commercial Blueberry growers
 - Georgia growers initially, eventually the country possibly.
 - What do you want the app to do?
 - Data of revenue possibilities and pollination responsiveness of blueberry varieties.
 - Check out different scenarios and make enterprise scenarios.
 - Challenges
 - A lot of deals are based on personal relationships with pre-established farms/ beekeepers, not economic profit.

- Renting bees in California is expensive (rental fees/ transportation)
 - Economic models in development are not fully produced yet.
- **What elements do you envision the app having?**
 - Elements include options for rentals/ buying for pollinators.
 - What elements of costs are important to consider?
 - Restoring bees after being shipped back
 - Pesticide prices
 - Real pest levels
 - Chemical per acre
 - What elements of risks are important to consider?
 - Shipping bees to California makes bees WEAKER and they need to be built back up to strength.
 - Pest levels also need to be considered as well, pesticide costs mainly.
 - What pieces of information are considered when making a decision to ship bees?
 - Pollination fees
 - Bees may become a lot weaker

Getting to know the Bee Renting & Shipping Process

- Who usually rents out bees?
 - Less than 50 beekeepers targeted running several 1000 bee colonies or several acres of blueberries. All have multiple revenue streams.
- What is the process of renting bees from the perspective of beekeepers?
 - Trucking companies visit beekeepers and pick up their bees for them. All run by brokers. Beekeepers need to do very little when shipping the bees to California.
- What is the process of renting bees from the perspective of the renters/farmers?
- What is the shipping process like?
 - How do beekeepers find vendors to ship their bees?
 - Brokers
 - Do they hire a larger shipping company?
 - Yes generally.
- Where are beekeepers in Georgia sending their bees?
 - Where are common places they send their bees?
 - Georgia blueberries bloom at the same time as California almonds.

Conclusions

- The pollination market is competitive.

- Where beekeepers send their bees depends on the prices of that season, some may find it advantageous to send them to multiple farms, one specific farm, etc.
- A changing market requires tracking for beekeepers to stay updated and find a good place to send bees.
- Individual beekeepers have little input into the process of shipping bees to pollinators. The process is facilitated by brokers and individual shipping companies do all the work.
- The California almond crop is the most profitable place to send bees in the winter, but for those on the east coast it can be unprofitable due to shipping costs.
 - Bees become exhausted after transportation and aren't as effective when they come back. Often some of them die as well.
- According to Dr. Delaplane the tendency to send bees to California is based largely off of pre-established relationships between farmers and beekeepers.
 - Beekeepers should focus more on profits and not the connections they already have with farmers; for east coast beekeepers, this means blueberries could be a better option.
 - Blueberries grow in the same season as almonds and may be more profitable for beekeepers in the East.
- Blueberry Farms
 - Less than 50 beekeepers targeted running several 1000 bee colonies or several acres of blueberries. All have multiple revenue streams.
 - Georgia blueberries bloom at the same time as California almonds.
 - Blueberry farmers pay a lot in pesticide costs and they need to be factored in when deciding pollinator expenses.
 - Beekeepers should have the option to send their bees to blueberry farms.