

Case Study

Bridging Demand and Supply in Specialty Crop Diversification: Exploring Market Potential of Finger Limes

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Abstract

Peter Wells, a fourth-generation Florida citrus grower, faces increasing challenges from hurricanes, urbanization, and diseases such as huanglongbing (HLB). At a University of Florida field day, he learns about finger limes (*Citrus australasica*), a recently introduced citrus crop with tolerance to HLB and growing appeal in gourmet food and beverage markets. Finger limes offer diversification and premium price opportunities, but uncertainties remain around supply chains, regulatory hurdles, and long-term demand. This teaching case places students in Peter's position as he considers whether to convert part of his land to finger limes, continue with traditional citrus, or exit citrus all together. Students are asked to analyze the opportunity using an integrated framework—supply chain mapping, economic systems, and diffusion of innovation—to weigh risks, motivations, and adoption dynamics. Designed for capstone undergraduate and master's students in agricultural economics and agribusiness, the case develops applied skills in market analysis, innovation adoption, supply chain evaluation, and strategic decision-making under uncertainty.

1 Introduction

In March 2025, on a morning in Citra, Florida, Peter Wells, a fourth-generation citrus grower, walked along the rows of his family's citrus grove. For nearly a century, the Wells's family business had depended on oranges and grapefruits. Like many growers, Peter had witnessed the impact of huanglongbing (HLB, or citrus greening disease) reshape Florida's citrus industry with declining yields, rising costs, and shrinking groves (Trejo-Pech et al. 2018; Grafton-Cardwell 2022). Between 2004 and 2025, citrus acreage across Florida declined from roughly 750,000 acres to only 208,183 acres; a drop of over 70 percent (USDA-NASS 2025b). Orange acreage was about 183,860 acres in 2025, with production in the 2024–2025 season, originally forecast at 11.6 million boxes. Later estimates increased the forecast to 12.2 million boxes. If realized, this would be a production decrease of over 30 percent from the prior season (USDA-NASS 2025a,c).

There were additional pressures on Peter's farm as well. All across Florida, hurricanes had damaged trees and raised insurance costs. Land around his grove was rapidly giving way to development. Younger growers who stayed in agriculture were diversifying into blueberries, olives, or peaches—often at high initial investment costs (Trejo-Pech et al. 2018). The question of whether to continue in citrus weighed heavily on him.

Peter had recently learned about finger limes (*Citrus australasica*), a specialty fruit native to Australia introduced to Florida through two University of Florida (UF) cultivars: UF SunLime and UF RedLime (Dutt 2022a). Finger limes produce elongated fruit filled with small, pearl-like juice vesicles—also called “citrus caviar”—that were attracting attention in high-end culinary and beverage markets for their texture, novelty, and visual appeal (Dutt et al. 2019; Faber 2021). Researchers emphasized the

tolerance to HLB, suggesting that finger limes could offer growers both resilience and access to premium niche markets (Emerging Industries 2023).

Driving home, Peter considered his options. Should he commit part of his grove to finger limes, taking on the risks of an untested crop but staying true to his family's citrus heritage? Or should he redirect his land and capital into another line of business altogether?

This case invites students to step into Peter's position and evaluate the opportunities and risks of finger lime adoption in Florida. The situation highlights how supply and demand factors interact, how innovation spreads, and how supply chain and policy environments shape the viability of new crops. Students are challenged to analyze real-life strategic choices facing growers like Peter, weigh stakeholder perspectives, and consider what information and institutional support are needed to reduce uncertainty in commercialization of an emerging crop.

2 Finger Limes and the Changing Citrus Industry

Florida's citrus industry has long been central to the state's agricultural economy, but its future is uncertain. Once a global leader in orange juice and fresh fruit, the sector has been severely affected by disease pressure, hurricanes, rising costs, and urbanization. Against this backdrop, finger limes emerged as a potential opportunity. Native to Australia, finger limes are elongated fruits filled with small vesicles that burst with citrus juice (Dutt et al. 2019; Faber 2021). Despite the shared name, they are very different from the traditional Persian, Tahiti, or Key limes familiar to most American consumers, which are typically served as a wedge of fruit or juiced. The vesicles of finger limes are extracted from the fruit and consumed individually, earning the nickname "citrus caviar." Their unusual texture and visual appeal have attracted interest from buyers who prize novelty and unique presentation in premium food and beverage markets. Recognizing this potential, the University of Florida released two HLB-tolerant cultivars in 2021, UF SunLime and UF RedLime (Dutt 2022a,b). Early field trials suggest that these cultivars not only tolerate HLB infection, with low bacterial titers and minimal symptom progression, but also maintain fruit quality under Florida growing conditions (Dutt et al. 2017).

From a buyer's perspective, finger limes are considered specialty or gourmet crops. While research has noted their antioxidant and phenolic content (Wang et al. 2019; De Vita et al. 2024), which adds health appeal, the main market advantage is culinary novelty rather than functional nutrition. This distinction matters: unlike blueberries or quinoa, which are often marketed for health benefits, finger limes are positioned as a luxury item used in cocktails, upscale dishes, or through direct-to-consumer novelty boxes.

Market trends point to growing demand for new food products by consumers. US specialty food and beverage sales rose to around \$206.8 billion in 2023—up from \$194 billion in 2022—and in 2024 represent roughly 21.6 percent of all center-store grocery sales in the 63 categories that were measured (Specialty Food Association 2024). Consumers in these markets often seek variety to avoid declining utility from repeated purchases (Ratner et al. 1999; Zhang 2022). Products with striking sensory attributes—such as unique flavor, texture, or appearance—are particularly attractive to early adopters (Barcellos et al. 2009). These trends suggest a receptive environment for emerging crops like finger limes, provided that supply chains can deliver reliable quality and prices to the right market segments. Whether finger limes become a sustainable alternative crop for growers depends on how well demand and supply can be aligned in the early years of adoption.

3 Market Signals and Industry Insights

Peter recognized that the existing market for finger limes was very thin, with untested marketing channels and regulatory barriers that could complicate commercialization (Poling 1999; Fletcher 2002; FDACS 2024). The prospect of capturing higher profit margins may be there if production and market

risks are effectively managed. Accessing niche markets, where premium prices may be obtained due to the fruit’s novelty and culinary appeal, is a motivation to explore further.

As an emerging industry, local or widely reported prices are not available, but there are online sales with finger lime prices from Florida and California distributors, showing a wide range. Peter found small packages of finger limes offered at levels equivalent to hundreds of dollars per pound. Direct-to-consumer prices ranging from \$68 to \$288 per pound (Table 1) reflect strong market potential for early adopters (Neff 2023).

By comparison, in 2024 traditional Key limes retailed for about \$1.30 per pound, or about \$0.40–\$0.50 per fruit, while finger limes sold for about \$9–\$10 per fruit under premium direct-to-consumer listings. For Peter, however, a more relevant benchmark is fresh citrus—the crop his family has depended on for generations. In the 2024–2025 season, fresh oranges in Florida averaged \$17.85 per 90-pound box, while fresh grapefruit averaged \$27.93 per 90-pound box (Citrus Industry Magazine 2025c). These prices translate to much lower per-pound grower revenue than specialty citrus like finger limes, but they reflect more established supply chains and markets. The disparity underscores both the opportunity and risk: Finger limes have the potential for exceptional margins on a per fruit basis, but achieving consistent profitability would require navigating premium markets and specialized handling not typically necessary with mainstream citrus.

Table 1. Direct-to-consumer finger lime prices in the US market, 2024

Company Name	Origin	Presentation	Color	Price per Package	Package Size	Price per Pound
Miami Fruit	Florida	Fresh	Red	\$127	200 g	\$288
Miami Fruit	Florida	Fresh	Red	\$177	400 g	\$201
Miami Fruit	Florida	Fresh	Red	\$297	800 g	\$168
Pearson Ranch	California	Fresh	Green	\$60	16 oz	\$60
Pearson Ranch	California	Fresh	Green	\$20	4 oz	\$80
Pearson Ranch	California	Fresh	Green	\$35	8 oz	\$70
IHeart Box	Florida	Fresh	Green	\$150	2–3 lb	\$68

Source: Compiled by authors from product listings on Miami Fruit, Pearson Ranch, and IHeart Box websites [accessed April 2024].

To explore the supply chain in more detail, the research team collected primary data between August 2024 and March 2025 from 119 stakeholders with interest in a potentially emerging Florida finger lime value chain. In addition to a UF/IFAS Finger Lime Field Day in Citra, data were collected at the Citrus Expo and the Campari Day of Service. Participants included 33 growers, 43 food enthusiasts, 15 extension agents, 11 mixologists, and 17 home gardeners. The surveys explored awareness and familiarity with finger limes, willingness to recommend the fruit, and willingness to adopt it either as producers or consumers.

Results showed strong awareness of the crop among most groups, with growers (88 percent) and extension agents (93 percent) reporting the highest exposure to finger limes. Yet awareness did not necessarily translate into confidence about adoption. Only about 70 percent of growers expressed willingness to adopt, and just 65 percent said they would recommend the crop, reflecting their uncertainty about production and marketing risks. By contrast, home gardeners—though not commercial producers—indicated both high willingness to adopt (88 percent) and recommend (80 percent), suggesting grassroots enthusiasm for the crop. Enthusiasts and mixologists, representing the consumer and culinary demand side, were especially positive. Over three-quarters of each group reported they would adopt or use finger limes, and more than 80 percent said they would recommend them, often

citing novelty and visual appeal as motivating factors. Extension agents stood out for their strong willingness to recommend (89 percent), but they paired this optimism with caution, emphasizing the need for more cost and production data before advising growers to commit to the crop. Taken together, the stakeholder responses summarized in Table 2 revealed a clear tension: While demand-side actors such as mixologists and enthusiasts were eager for finger limes, the more cautious stance of growers and extension agents signaled that Peter might face challenges in aligning supply with demand without greater extension and industry engagement.

Table 2. Stakeholder awareness, willingness to adopt, and willingness to recommend finger limes in Florida, 2024–2025

Stakeholder Group	Awareness (percentage reporting having heard of finger limes)	Willingness to Adopt (percentage likely/very likely)	Willingness to Recommend (percentage likely/very likely)
Growers	88%	70%	65%
Enthusiasts	70%	77%	81%
Mixologists	64%	78%	85%
Extension agents	93%	89%	89%
Home gardeners	88%	88%	80%

Source: Authors’ calculation based on the stakeholder survey data.

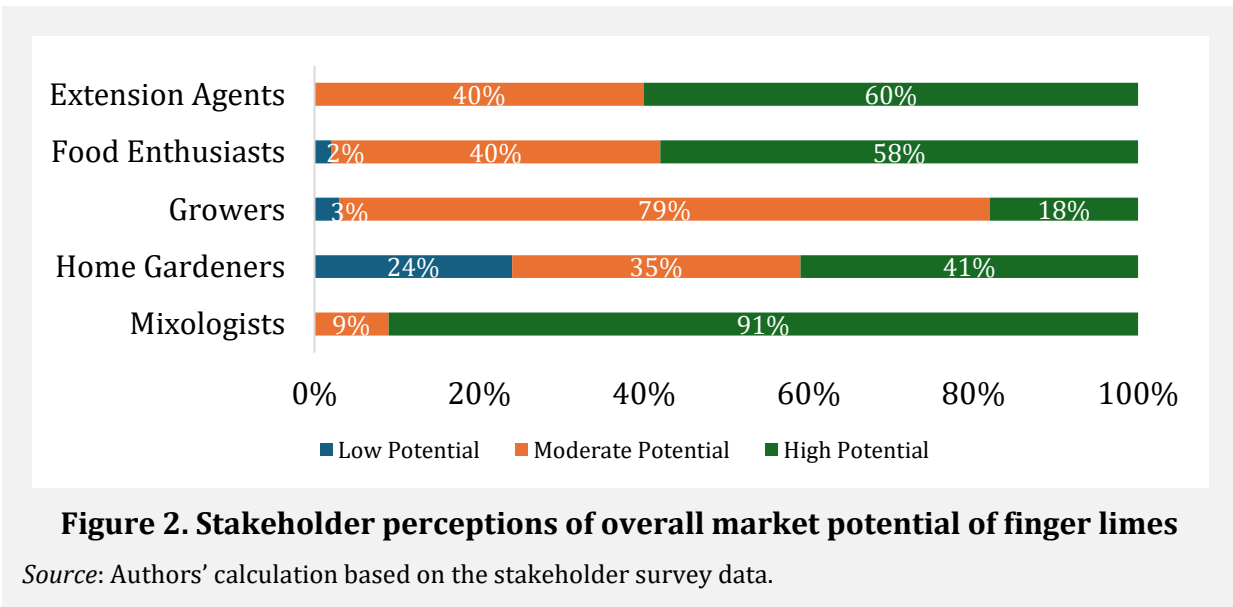
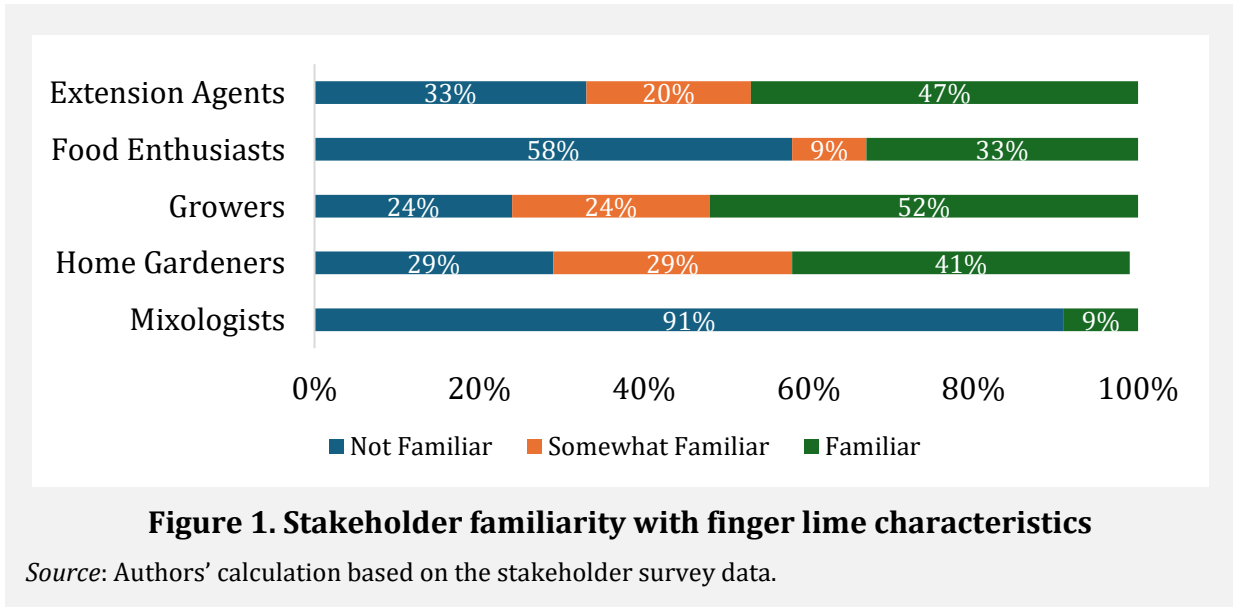
Even though over half of the respondents in each group reported that they were aware of finger limes, Peter was especially curious to see how familiar they were with the crop and fruit characteristics. Figure 1 shows that growers and extension agents were the most familiar with finger limes, reflecting their exposure at field days and research events. Even so, nearly half of growers reported only limited familiarity, underscoring the uncertainty about how to cultivate or market the crop. By contrast, mixologists had overwhelmingly little exposure—over 90 percent reported being “not familiar”—but this lack of familiarity did not translate into skepticism.

When stakeholders were asked about overall market potential, optimism varied sharply across groups (Figure 2). Mixologists, despite their low familiarity, were overwhelmingly positive: More than 90 percent rated finger limes as having high potential. Food enthusiasts also leaned optimistic, with nearly 60 percent rating high potential, showing strong consumer-side demand drivers. Extension agents were moderately supportive, with 60 percent seeing high potential but emphasizing the need for more agronomic and cost data before promoting the crop. Home gardeners were split, but over 40 percent still saw high potential, suggesting popular interest. Growers stood out for their caution: Almost 80 percent rated finger limes as having only moderate potential, reflecting their practical concerns about production risk and marketing uncertainty.

For Peter, these contrasts highlighted a central dilemma: The groups that would ultimately drive demand (mixologists and enthusiasts) were most enthusiastic, while the groups closest to production (growers and extension agents) were most hesitant.

Peter attended a UF/IFAS field day to see a production system for himself. Conversations there revealed a different layer of challenges. Finger limes grow on thorny bushes, and questions arose about how to harvest them efficiently or how much labor would be required. Industry reports highlight that while finger limes show promise as a specialty crop, growers still face uncertainty related to production practices, postharvest handling, and market development, reinforcing the need for data-driven guidance to support commercial adoption (Herrick 2025). Without reliable guidelines, many growers worried that establishment costs could outweigh potential price premiums. Survey results confirmed that harvesting

difficulties, uncertain buyers, and small market size were viewed as the biggest challenges to adoption by growers (Figure 3).



The news was not all bad though. Mixologists who spoke at the field day focused on sensory value and their demand for new products. They praised finger limes' unique "citrus caviar" vesicles and vibrant colors, noting how the fruit could elevate a cocktail or dish. But they admitted that storage and preparation made routine use difficult. Standard refrigeration could damage the fruit (Neff 2024), and deseeding added an extra step to bar prep.

Extension professionals emphasized the information gap. Their programs depend on robust data from field trials, budgets, and feasibility studies. With finger limes still new to Florida, they lacked validated results data to share with growers. As one extension agent put it, "We need to see finger limes perform under Florida conditions before we can recommend them." Without this agronomic evidence, they felt more comfortable prioritizing established alternatives like blueberries.



Figure 3. Grower perceptions of key production and marketing challenges for finger limes

Source: Authors' calculation based on the stakeholder survey data.

Because Peter was a grower himself, he first examined how his peers viewed the crop. Survey results showed that growers placed the highest importance on HLB resistance, profitability, and yield potential. These responses reflected their immediate need for crops that could withstand disease pressure while still delivering returns in an increasingly risky environment. By contrast, novelty and post-harvest handling received lower ratings, underscoring that growers approached finger limes as a production and risk-management decision rather than a marketing opportunity (Figure 4).

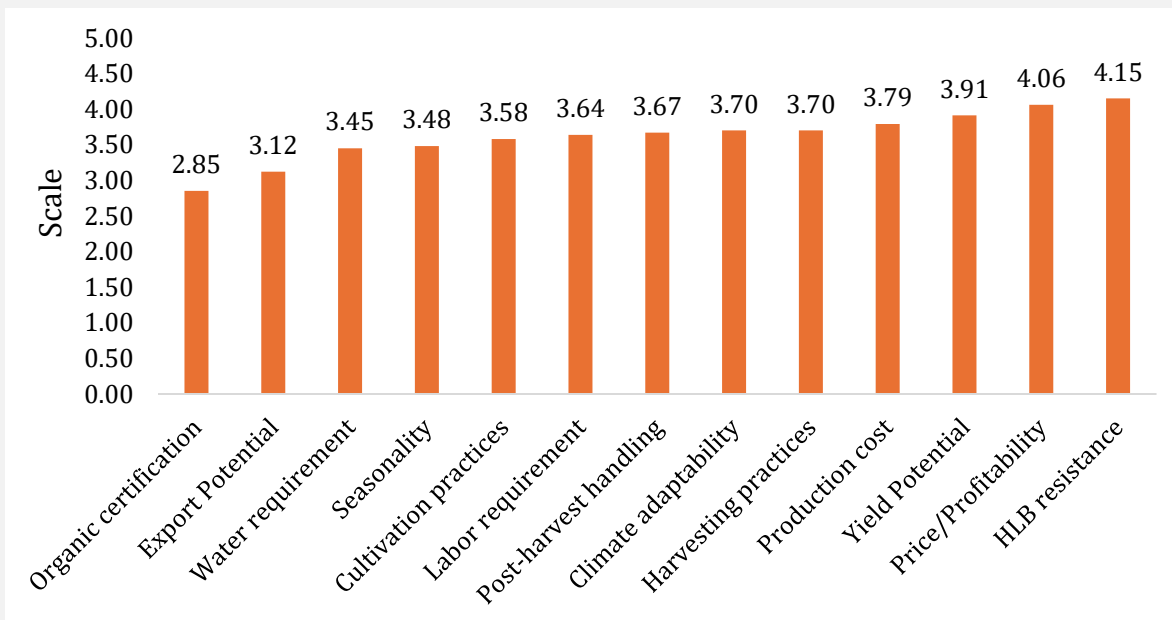


Figure 4. Importance of factors influencing growers' decision to cultivate finger limes

Source: Authors' calculation based on the stakeholder survey data.

Despite these challenges, Peter knew there could potentially be a big advantage to moving first in a new market. For that, he would need more information on buyer and consumer perspectives. Understanding the demand potential was just as important as knowing grower perspectives. Food enthusiasts—consumers willing to pay for novelty—emphasized taste, shelf life, and versatility in recipes (Figure 5). Mixologists, who directly influence high-end culinary trends, placed the highest value on flavor, price, versatility, and consistent supply. Their enthusiasm suggested strong potential demand, but their concerns about deseeding and supply reliability pointed to real challenges for scaling (Figure 6). Together, these groups illustrated both the opportunity and the fragility of niche demand: Finger limes could thrive in specialty markets, but only if growers could meet expectations for quality and availability.

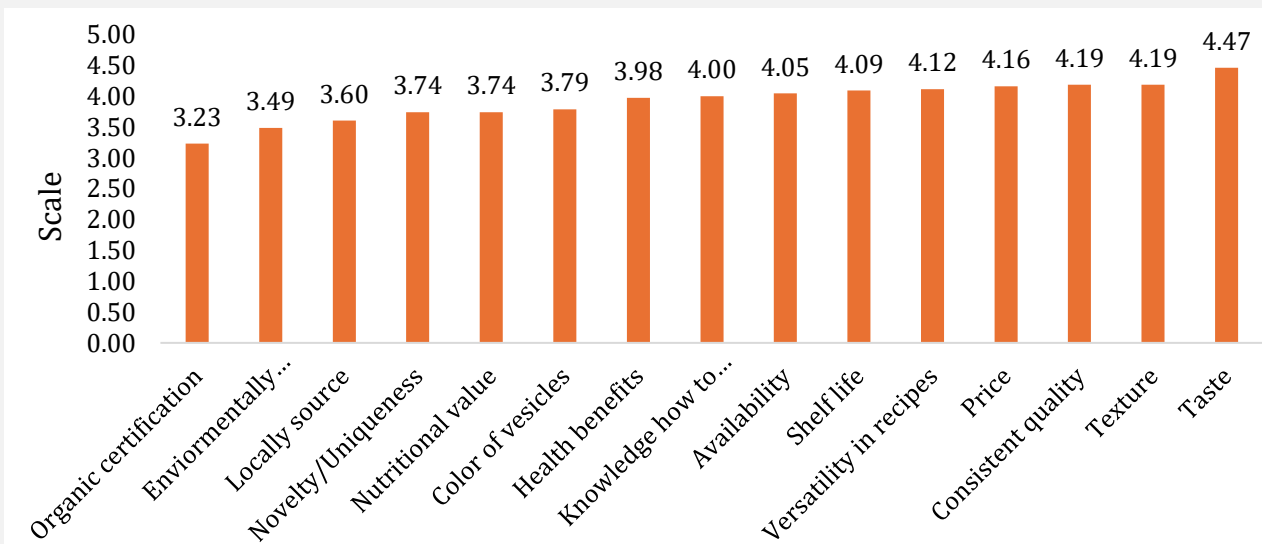


Figure 5. Importance of factors in food enthusiasts' purchase decisions for finger limes

Source: Authors' calculation based on the stakeholder survey data.

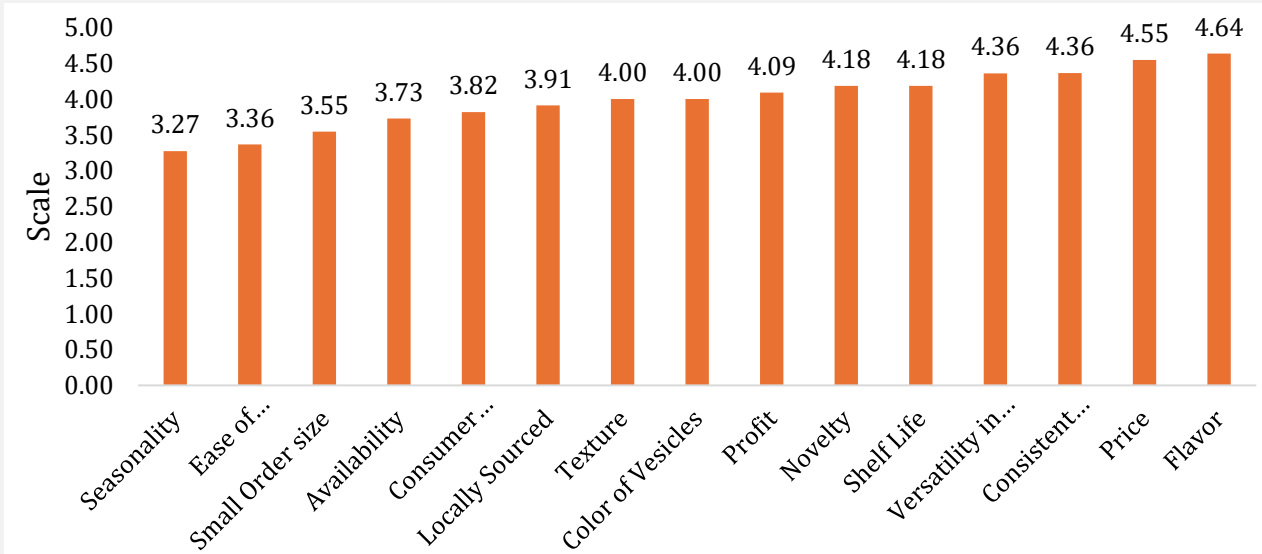


Figure 6. Importance of factors in mixologists' decisions to use finger limes in cocktails

Source: Authors' calculation based on the stakeholder survey data.

Extension professionals were another important stakeholder group, since they are trusted advisors for growers across Florida. Like the growers themselves, their responses prioritized labor requirements, HLB resistance, and market development potential (Figure 7). This reflected their responsibility to evaluate new crops both agronomically and economically before making recommendations to growers. For Peter, the cautious stance of extension agents reinforced the idea that institutional support for finger limes was still limited.

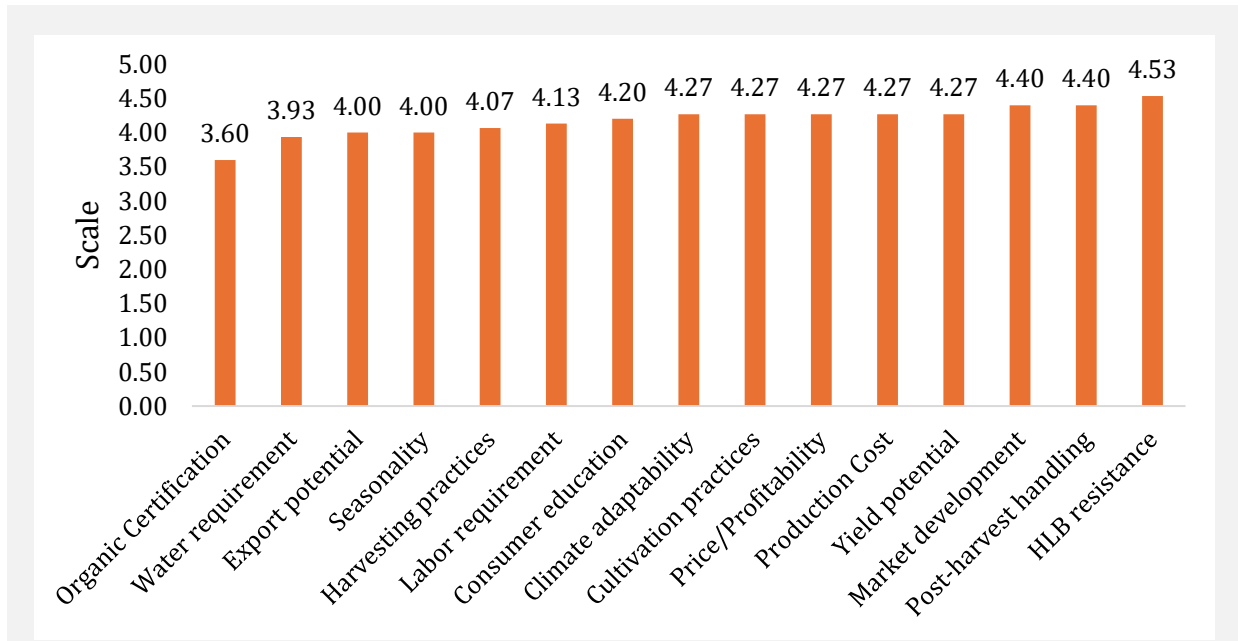


Figure 7. Importance of information needs for extension agents to support finger lime adoption

Source: Authors’ calculation based on the stakeholder survey data.

Finally, Peter considered responses from home gardeners. Although not large-scale producers or a commercial market segment for Peter, they could support early awareness and trial of finger limes through gardening interests and local word-of-mouth promotion. Their priorities centered on climate adaptability, flavor, and harvesting practices, reflecting a more personal and practical perspective. Novelty and space requirements ranked low, suggesting that while finger limes intrigued them, home gardeners ultimately cared about whether the crop was manageable and rewarding to grow (Figure 8).

After the Finger Lime Field Day, Peter drove back to his farm with a folder full of handouts and survey summaries. The information confirmed what he already knew: Traditional citrus in Florida faced steep challenges: yields had fallen, costs had risen, and growers across the state were exiting the business. Even with the uncertainties of an emerging crop, finger limes, with their HLB tolerance and premium pricing, might offer an opportunity. There were definitely challenges to overcome, but Peter also knew that first movers can capture significant early returns from an emerging market. He decided to take a more systematic look to identify potential opportunities.

3.1 Supply Chain Mapping

To evaluate whether finger limes could be a viable crop for his farm, Peter needed more than price lists and field-day conversations. He was worried that even if he could grow finger limes successfully, weak

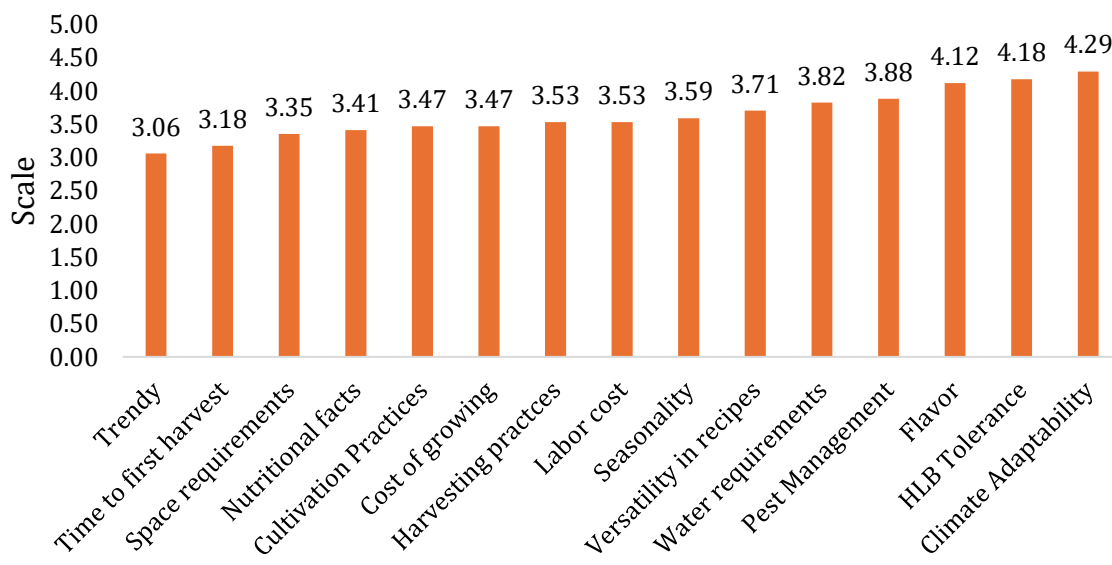


Figure 8. Importance of factors in home gardeners' decision to grow finger limes

Source: Authors' calculation based on the stakeholder survey data.

links in postharvest handling and distribution meant he could be left with fruit but no clear market outlet. Growers like Peter were not only concerned with production decisions but also with a broader strategic question: How finger limes move from the field to consumers. To navigate this complexity, growers often rely on extension professionals, industry specialists, and research-based guidance to understand available marketing channels, logistical constraints, and coordination challenges beyond the farm gate. Supply chain mapping—the process of systematically identifying, visualizing, and analyzing all flows of materials or products from the upstream to the downstream ends of a supply chain (MacCarthy et al. 2022)—provides a useful framework for addressing these questions. This practice serves as a critical foundation for effective supply chain management. Mapping reveals where information gaps or infrastructure weaknesses exist, enabling growers, marketers, and policymakers to design targeted interventions that strengthen the supply chain, enhance product reliability, and build market confidence. Supply chain mapping has been widely used as an essential tool for understanding the network of interconnected actors, identifying system vulnerabilities, and pinpointing inefficiencies and uncovering opportunities for value addition throughout agrifood supply chains (Kaplinsky and Morris 2013; Norwood and Peel 2021). Applying supply chain mapping to the finger lime industry is especially important given its status as a novel specialty crop with an underdeveloped supply network. By systematically mapping the finger lime supply chain, Peter identified key actors, clarified the sequence of activities from production to market, and detected potential bottlenecks that might impede product flow or compromise quality for finger limes as a viable and premium specialty crop (Figure 9).

The supply chain starts with nurseries that propagate finger lime trees on select rootstocks and agricultural input suppliers who provide essential materials necessary to establish trees in the field. These resources are delivered to growers, the principal production actors, who are responsible for grove management, cultivation, harvest, and initial post-harvest handling to maintain fruit quality and safety. After that, processors, wholesalers, and distributors will become key players. Processors (including packers) sort, clean, grade, and package the fruit to meet market specifications. Wholesalers and distributors manage the logistics of moving large volumes of product to various markets through cold chains and storage networks.

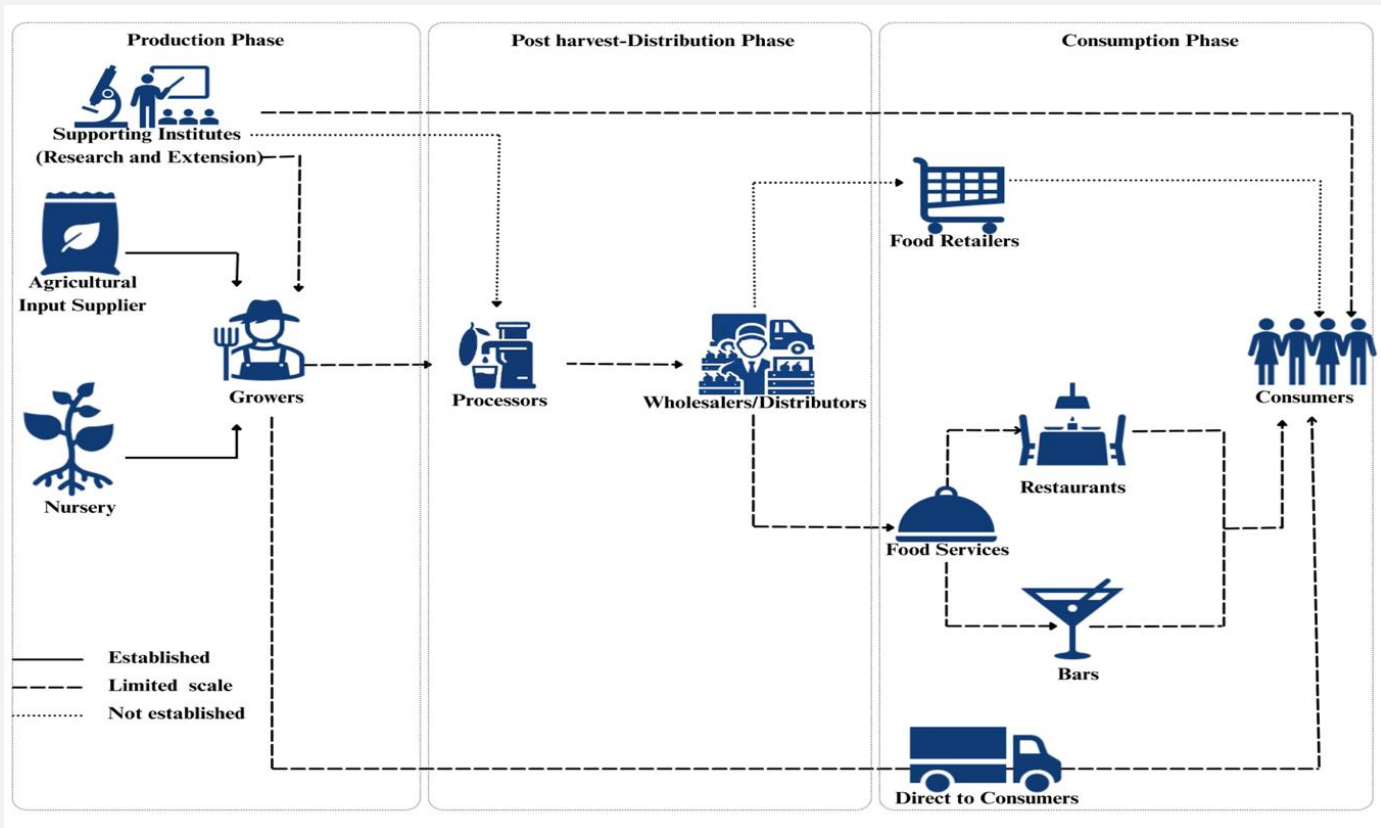


Figure 9. Finger lime supply chain map

Notes: Solid lines indicate established supply chain relationships; dashed lines indicate established but limited-scale relationships; and dotted lines indicate relationships that are not yet established.
Source: Authors’ conversations with stakeholders and industry representatives.

Next, the supply chain branches into two primary commercial market channels: food retailers and food services. Food retailers include specialty grocery stores and upscale markets that sell finger limes directly to consumers. Food services, such as high-end restaurants and bars, represent an influential market segment, where chefs and mixologists leverage finger limes’ unique sensory qualities (especially their “citrus caviar” texture) in gourmet dishes and cocktails (Neff 2022). These actors play a pivotal role in educating consumers, shaping demand, and increasing market visibility through creative applications and word-of-mouth influence.

In parallel, a direct market channel allows some growers to bypass intermediaries, selling finger limes directly to consumers through farmers markets, farm stands, and online platforms (examples include Miami Fruit and Shanley Farms). Although this segment operates on a small scale, it currently represents the primary and most accessible outlet for average consumers to order finger limes, given that formal post-harvest supply chains to mainstream food retailers have yet to be established. Sales to restaurants are similarly limited, largely confined to high-end establishments where chefs seek specialty ingredients. This direct-to-consumer approach not only provides growers with higher margins but also fosters closer relationships with niche markets, playing a pivotal role in sustaining early demand and awareness for the crop (FarmstandApp 2025).

Regulatory bodies and research and extension professionals are embedded throughout the supply chain. They provide essential oversight and support, such as helping nurseries maintain plant health standards (Allen 2019), advising growers on pest management (Toepfer et al. 2020) and enterprise

budget (Lloyd and Thilmany 2008), guiding processors and packers in food safety compliance (Allen 2019), and promoting market development through outreach and education (USDA-AMS 2022). For example, USDA programs assist specialty crop producers with food safety certification costs, ensuring compliance with regulatory requirements, while extension professionals bridge the gap between research and on-the-ground practices to enhance market access.

Looking at the supply chain map, Peter realized that while nurseries and a few direct-to-consumer outlets existed, the processor and retail connections were missing. This meant if he planted finger limes, he might have fruit without a clear place to sell it or buyers who only wanted limited volume. Currently, most sales depended on direct-to-consumer channels, while formal distribution to food service and retail were limited. For Peter, this suggested that early adopters faced not only production risks but also weak marketing channels.

Regulatory hurdles, developed in response to the current citrus disease pressure in Florida, added costs and complexity for anyone considering finger limes in the state. Florida's Citrus Nursery Stock Certification Program required all commercial trees to come from certified, disease-free rootstock, including nematode testing, which added \$15–\$20 per tree for small-scale growers, while backyard nurseries were exempt but still had to register (Florida Administrative Code 2015). Quarantine rules further complicated matters: In counties affected by citrus black spot (CBS) or citrus canker, fruit shipments had to be covered with tarps and sent to approved packinghouses, raising logistics costs (FDACS 2024). Opportunities for international trade (imports or exports) appeared very limited at this early stage of market development. Even crossing state lines was challenging. Distributors shipping to California, for instance, had to comply with USDA-APHIS agreements that mandated pre-inspections, phytosanitary certificates, and cold-chain protocols—even for small specialty shipments (Ross 2024). Fungicidal wax treatments were also required for fresh citrus, including finger limes, which sometimes conflicted with marketing the fruit as a “natural” premium product (USDA-APHIS 2024). Extension professionals observed that these rules were originally designed for large-scale citrus production but were applied equally to emerging specialty crops like finger limes, creating disproportionate costs for small growers. Without targeted institutional support, it remained uncertain how quickly regulatory and policy frameworks could adapt to encourage specialty citrus innovation.

4 Integrated Theoretical Framework

Supply chain mapping really helped, but Peter felt he still needed to make sense of the bigger picture: what motivated different actors within that supply chain and how innovations spread. Two additional frameworks—economic systems and diffusion of innovation—could help frame these questions. Rather than providing answers, these frameworks offer an approach through which Peter (and students) can analyze the institutional, behavioral, and logistical factors shaping the commercialization of finger limes in Florida.

4.1 Economic Systems

Economic systems describe how societies organize production, allocate resources, and determine who benefits. For Peter, this framework underscored that planting finger limes was not only about yields. His decision depended on whether motivations aligned, who controlled market access, and whether credible information could reduce uncertainty. Scholars emphasize three structures that shape outcomes: motivation, decision-making, and information (Neuberger and Duffy 1976; Conn 1977; Enderle 2017).

4.1.1 Motivation

For finger limes, motivations differ across stakeholders. Growers see diversification and HLB tolerance as attractive traits but are cautious about market uncertainty. Consumers and food enthusiasts are

motivated by novelty and appearance (Barcellos et al. 2009; Zhang 2022), while mixologists and chefs value exclusivity and presentation (Neff 2022). Extension professionals are motivated by climate resilience and diversification goals, but they need validated data before promoting the crop (Davis and Serrano 2016).

4.1.2 Decision-Making

Authority is dispersed. Individual growers decide whether to plant finger limes, but they are constrained by regulations such as Florida's Citrus Nursery Stock Certification Program (Florida Administrative Code 2015) and USDA shipping rules (USDA-APHIS 2024). Distributors and buyers also hold power in deciding whether the fruit enters mainstream channels.

4.1.3 Information

Reliable data are scarce. Much of what is known comes from field days, grower conversations, and early UF/IFAS trials (Neff 2024; UF/IFAS 2024). Without solid yield or market studies, growers must often rely on word-of-mouth or limited demonstrations. How growers interpret and act on this incomplete information is central to the decision Peter faces.

4.2 Diffusion of Innovation

Beyond supply chain structure and incentives, Peter also wondered how new crops typically gain acceptance. But where to begin? Finger limes were an emerging product throughout the supply chain. Diffusion of Innovation (DOI) theory explains how new products spread through a social system (Rogers 2003): Adoption is influenced by relative advantage, compatibility, complexity, trialability, and observability. Individuals who adopt innovations can be grouped into five categories: innovators, early adopters, early majority, late majority, and laggards (Figure 10).

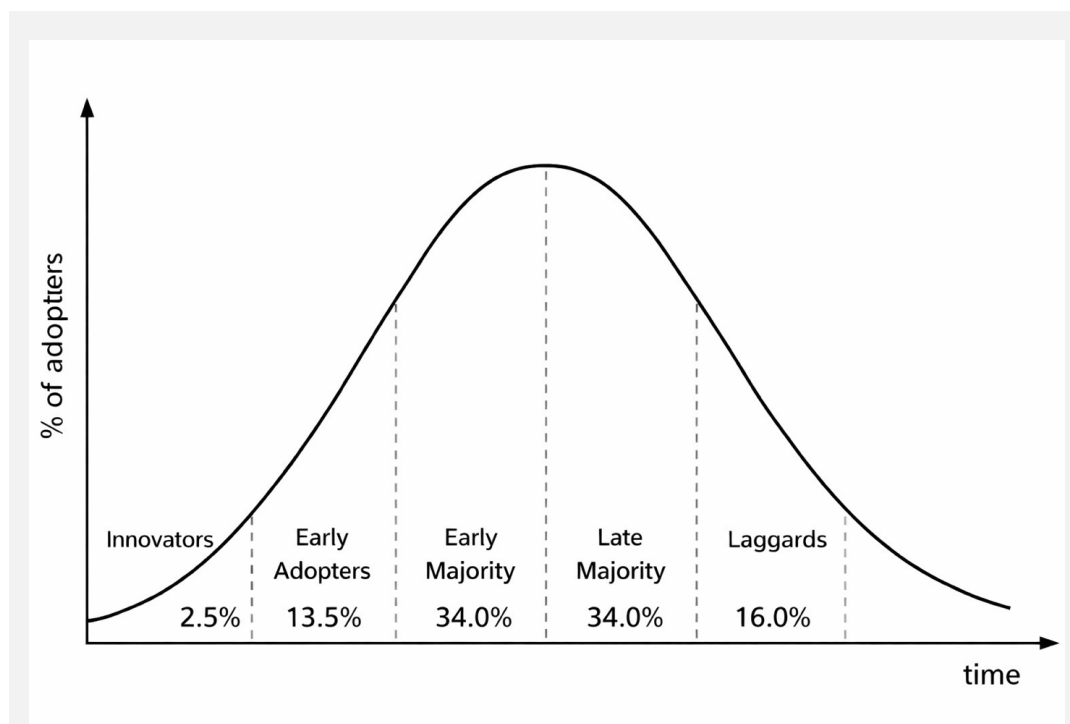


Figure 10. Adopter categories in the diffusion of innovation process

Source: Rogers (2003).

DOI theory has been widely used to study agricultural and food innovations. For example, consumers adopting plant-based diets were motivated by sustainability and novelty (Gonera et al. 2021), while during COVID-19, early adopters promoted local food and online platforms (Yang et al. 2024). On the production side, DOI has explained grower adoption of hydroponics, hoop houses, and cover crops (Lavoie et al. 2021; Torres 2022).

Applied to finger limes, the DOI theory raises questions about who might adopt first and why. Finger limes were in the early stages of diffusion. Chefs and mixologists could serve as innovators by experimenting with finger limes in cocktails and gourmet dishes. Food enthusiasts and direct-market consumers may act as early adopters, willing to pay for novelty. Most growers, however, were waiting on for proof of profitability and reliable buyers before joining the early or late majority. For Peter, DOI suggested that his choice might depend on whether he saw himself as an early adopter willing to take risks or as someone who would rather wait until others had tested the waters.

Together, these frameworks do not provide a single “correct” answer but instead raise a set of questions that Peter must confront before making his decision. What motivates the different actors across the finger lime supply chain to participate, and are those motivations aligned? Who ultimately controls access to markets, and how might that influence Peter’s ability to sell his fruit? What information—about production, costs, or buyers—could help reduce uncertainty related to potential adoption? Finally, how would finger limes’ market positioning and market share change over time, and what role could early adopters play in shaping that process?

5 Peter’s Decision Point

Peter’s decision was not easy, but a choice had to be made. Over the past years, declining yields from huanglongbing (HLB), rising input and labor costs, and repeated storm damage had steadily eroded the profitability of his remaining citrus acreage. Although Peter had already reduced the size of his grove, maintaining unproductive trees was becoming increasingly costly. As a result, continued investment in traditional citrus appeared no longer financially sustainable. The supply chain map revealed gaps between growers and large buyers. Regulatory hurdles meant additional costs and compliance steps, even for small-scale operations. Stakeholder surveys showed enthusiasm among chefs and consumers but uncertainty among fellow growers. Still, early movers in a market could often capture higher returns before there were more entrants. Prices looked impressive, but Peter knew high premiums could also signal a fragile niche market rather than a stable long-term opportunity.

At 46 years old, Peter was not new to farming and hoped to eventually pass down the farm to his own children. He operated a mid-sized Florida citrus grove typical of many family-owned operations in the region—large enough to require commercial-scale decisions but too small to easily absorb prolonged losses or experimental failures. He had already scaled back his citrus acreage over the years as disease pressure and urbanization squeezed margins. Now, he faced a pivotal choice:

- (1) Plant finger limes on part of his grove, betting that early adoption would help him secure premium markets, while knowing he would be operating with limited information and underdeveloped infrastructure.
- (2) Wait and watch, continuing to rely on his remaining citrus while monitoring whether finger limes gained traction with other growers and buyers.
- (3) Exit citrus altogether, redirecting his land and family resources into a different enterprise, walking away from a four-generation legacy in the industry.

Each path carried risks. Planting finger limes meant entering uncharted territory, with regulatory obligations, uncertain buyers, and high establishment costs. Waiting meant likely further erosion of his

grove's profitability as HLB, and other pressures continued to spread. Exiting meant leaving behind not only citrus but also the family identity tied to the crop.

Peter pulled into his driveway that evening knowing the decision could not be delayed much longer. Spring planting season was approaching and nurseries had already begun propagating finger lime trees. If he wanted to secure rootstock, he would have to act quickly.

What should Peter do?

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