

Knowledge and Use of Contracts, Digital Platforms, and Blockchain Technology by Small Scale Specialty Crop Growers: Focus Group Findings

Summary

In collaboration with AgLaunch and its Farmer Network, Mississippi State University conducted an online focus group with four small-scale, specialty-crop producers from Tennessee on December 3, 2021. Insights from this focus group provide helpful information for Extension educators regarding farmers' views and use of marketing contracts/agreements and digital trading, marketing, and payment platforms, including their experience trialing the features of different platforms and the advantages and disadvantages of the platforms used. This publication also summarizes farmers' preferences for marketing their agricultural products and the effects of the COVID-19 pandemic on their operations. It concludes with a discussion of farmers' views and knowledge of blockchain technology, internet access, and mobile applications.

The experiences shared by farmers can inform the development of Extension education and outreach efforts to assist producers in their marketing decisions and the assessment of new online marketing tools. For example, this publication provides insights for Extension professionals regarding the marketing outlets, marketing strategies, and digital tools that small-scale, specialty-crop growers are looking to learn and test to reach consumers and meet their needs. In addition, educators can gain insights regarding growers' concerns and the features sought after in digital marketing platforms, products, or services. Other needs identified by growers included tools and knowledge to conduct health and cooking education-based marketing. There is an opportunity for Extension educators to assist growers in providing this type of information (for example, nutrition, recipes) and strategies for sharing this information with consumers. As the adoption of digital platforms and cashless payment mechanisms continues to gain momentum, educational efforts in this area are needed to provide farmers with the knowledge and tools they need to make informed decisions.

Here are the main findings of the focus group:

- ▶ Participating farmers were small-scale (1 to 6 acres), specialty-crop growers of leafy greens, root crops,

and other vegetables. Current certifications included Certified Naturally Grown (CNG) and USDA Organic, while past certifications included Good Agricultural Practices (GAP). The presence of a buyer requiring GAP certification drove the farmers' decision to get certified.

- ▶ Some digital trading/marketing platforms they use include Shopify and Barn2Door. Platforms they previously used or tested include Farmigo and Harvie for Community Supported Agriculture (CSA), Squarespace, and Local Line. They also discussed digital platforms to process payments at the farmers' market, including PayPal, Square, Cash App, and (PayPal-owned) Venmo, as well as the pros and cons of these platforms based on their experience. When asked what an ideal new platform to sell to institutional buyers would look like, one farmer stated that the platform "would have to be better than Shopify. Something we did not know we needed."
- ▶ Their most important concerns regarding digital trading/marketing platforms and the features they seek in such platforms include the benefits outweighing the costs, convenience for their customers, ability to communicate with their customers, privacy and security, cybersecurity threats, customer service/support by the platform developers, training and technical assistance opportunities, and the platform's ability to work/connect with other systems used on the farm (in other words, interoperability).
- ▶ They agreed that the importance of communicating farm and product attributes to buyers through a trading/marketing platform depends on what their buyers want, their location, and their relationship with them. They also agreed that different buyers place different emphasis on these attributes.
- ▶ They observed the repercussions of the COVID-19 pandemic regarding the closure of many restaurants and food-service institutions and the negative impact those closures had on produce suppliers. Some farms emphasized online sales, while others downsized or closed permanently.
- ▶ They use or had used verbal or informal agreements instead of written or formal contracts. Key contract attributes include quality and processing specifications, payment method and turnaround, delivery and

packaging requirements, delivery time, a guaranteed purchase, a guaranteed minimum price, and penalties for non-fulfillment. If formal contracts were an option, these would be important if they were selling higher volumes to wholesalers, selling to buyers with whom they did not have an established trust relationship, or if the transaction involved custom product requests for which they had to considerably invest additional time and resources. Depending on the parties' risk tolerance, the higher their perceived risk from these transactions, the more they would favor formal contracts.

- ▶ The farmers had heard about blockchain before, but their level of familiarity ranged from minimal to very familiar. After learning more about blockchain and smart contracts, most farmers expressed that they would feel comfortable using blockchain ledgers to store their information but thought the technology might be better suited for transactions with institutional buyers.
- ▶ Their concerns about blockchain applications in agriculture and food supply chains included a need for a better understanding of these applications and their problem-solving capabilities, the cost and transaction fees, and long-term sustainability.
- ▶ They expressed comfort using mobile applications in general. However, all farmers viewed internet access as an issue for rural and urban locations.

Farmer Characteristics

Table 1 shows a summary of participating farmer characteristics. The farmers indicated growing a variety of vegetables on 1 to 6 acres of land. Some of the vegetables include tomatoes, peppers, onions, cabbage, peas, green beans, winter squash, sweet potatoes, eggplant, okra, kohlrabi, root crops (including beets, carrots, radishes, and turnips), garlic, microgreens, lettuce, kale, Swiss chard, collards, mustard, and other leafy greens. Most farmers

Table 1. Summary of farmer characteristics.

Farmer	Produce grown	Cultivated acres	Certifications ¹
A	Leafy greens, vegetables, root crops	6	GAP (past)
B	Leafy greens, vegetables, root crops	3	CNG (current) GAP (past)
C	Leafy greens, vegetables	1	GAP (past)
D	Leafy greens, vegetables, root crops, fruit (urban farm)	2	USDA Organic (current)

¹GAP stands for Good Agricultural Practices; CNG stands for Certified Naturally Grown.

sell these products directly to consumers through market outlets such as farmers' markets, farm stores, and online stores. They indicated occasionally selling to wholesalers, grocery chains, food retailers, food hubs, and restaurants. The farms have been cultivating a relatively small acreage primarily due to labor challenges. They mentioned decreasing their cultivated area over the years and focusing more heavily on online sales and home deliveries to keep their operations afloat during the COVID-19 pandemic.

Farmers' current certifications included Certified Naturally Grown (CNG) and USDA Organic. Three farmers were previously certified for Good Agricultural Practices (GAP). However, they ceased seeking GAP certification once they stopped selling to wholesale buyers or once it was no longer required by their wholesale buyers. In all cases, the presence of a buyer requiring GAP certification drives the farmer's decision to get certified. While one farmer's wholesale buyers no longer required GAP, the farmer indicated having a formal food safety plan, updating it regularly, and hosting farm visits with buyers to explain their agricultural practices. The farm redirected the certification investment toward buying more equipment and cited the COVID-19 pandemic as an additional reason to not seek recertification. The other two farms indicated that they stopped selling to wholesale buyers either because the farm decided to quit selling to organizations requiring GAP or because the buyers changed their business model or went out of business. Even if they did not seek recertification because sales requiring it stopped, one of these farms indicated that their agricultural practices remain unchanged. They welcomed not incurring the certification and other transaction costs (for instance, time spent completing paperwork) but are open to seeking recertification in the future.

Use of Digital Trading/Marketing Platforms

Three farmers use or have used digital trading/marketing platforms to sell online directly to consumers or restaurants. The other farmer does not use a platform but is searching for one as the farm expands its yields, value-added offerings, and processing capacity. The digital trading/marketing platforms in use include Shopify and Barn2Door. Platforms they previously used or tested include Farmigo and Harvie for Community Supported Agriculture (CSA), Squarespace, and Local Line. Table 2 summarizes the pros and cons of selected digital trading/marketing platforms according to farmers' experience. Farmers with prior experience with online trading/marketing platforms had overall positive opinions. These platforms have helped them secure payment before delivery and increase their share of online sales during supply chain

Table 2. Growers' focus group discussion of pros and cons of selected digital trading/marketing platforms.

Platform	Pros and cons
Shopify	The farmers liked the platform's ease of use, website building capabilities, flexibility, ability to plug-and-play other add-on apps as needed, and the availability of farmer-friendly business options. They have used its options for email marketing, discount codes, subscriptions that can be paused/canceled, tailoring delivery fees to the buyer's zip code, and accepting Bitcoin as a method of payment. They also liked that it was relatively inexpensive and offered regularly released system updates.
Barn2Door	The farmers found this platform helpful for agricultural co-ops. Customers can select the location/farmers' market closest to them to pick up their order, and the platform gives farmers the ability to pause and add products weekly.
Farmigo	The farmers' experiences were okay, but they noted that they had to reach a specific transaction volume to cover the platform's fees.
Local Line	The farmers liked many of its features, including the relevant information displayed during the checkout process. However, the platform lacked some of the features they needed. For instance, they could not offer discount codes to first-time or high-volume customers or manage product drop-offs and charge different fees depending on the buyer's zip code. Delivery logistics were particularly important for more isolated rural farms.

Disclaimer: Links to organizations, certifications, and digital marketing and payment platforms mentioned in this publication are included at the end of this publication. These links are being provided as a convenience and for informational purposes only. The mention of any specific platform, product, or service does not constitute an endorsement, recommendation, or favoring by the Mississippi State University Extension Service over other platforms, products, or services not named. Similarly, the omission of other platforms, products, or services does not imply they are not satisfactory. Other advantages and disadvantages not discussed during the focus group could exist.

disruptions such as the COVID-19 pandemic. When asked what an ideal new platform to sell to institutional buyers would look like to them, one farmer stated that for them to try something new, the platform “would have to be better than Shopify. Something we did not know we needed.” Regardless of platform, one farmer pointed to shipping logistics (for example, packing fragile items, time required to prepare and ship items) as potential challenges to selling products online, particularly value-added products in glass containers. One farmer indicated that having an employee dedicated to managing the digital platform and online sales was helpful. Another farmer indicated that having an employee dedicated to customer service for online sales might influence customer trust and their intention to purchase repeatedly.

The farmers also discussed digital platforms to process payments at the farmers' market, including PayPal, Square, Cash App, and (PayPal-owned) Venmo. Some farmers preferred Venmo tags and Cash App's cashtags to PayPal due to lower transaction fees (even if sales deposits took several business days to clear), convenience for them and their customers, faster transactions when interacting with customers, and the fact that most of their customers were either familiar with these payment mechanisms or willing to use them. Some farmers using their mobile phone as a payment swap mechanism found that the scanning of a QR code (versus typing in credit card information if no card reader is available) was more convenient for time-pressed customers and sellers relying on incoming calls to complete other business transactions. They suggested having a clipboard ready with their business tags/codes so customers

can scan them with their or the seller's smartphone. One farmer using Square to process payments at the farmers' market appreciated the application's ability to collect email addresses, which the farm uses to communicate with customers, and perceived Square's customer service to be better than PayPal's. In terms of processing online payments on the farm's website, this farmer believed that limiting payment options might prevent some customers from buying and thought it better to offer as many payments options as possible. In this case, the farmer's website takes a variety of payments including Bitcoin, which the farmer sees as a promising technology and a way to differentiate the operation from other sellers.

Concerns and Key Features Regarding Digital Trading/Marketing Platforms

The farmers' most important concerns regarding digital trading/marketing platforms and the features they seek in such platforms include the following:

- ▶ **Benefits outweighing the costs:** Expectedly, farmers expressed concern about the impact of the cost of these platforms on their bottom line and the need for these platforms to align with their business needs.
- ▶ **Convenience for their customers:** Farmers are interested in platforms that are accurate, fast for time-pressed buyers, and easy to use and navigate. They expressed concerns over losing customers if the platforms are slow or internet connectivity is unreliable. According to customer feedback they have received, customers prefer having a variety of payment options but prefer not having to create an account at checkout.

- ▶ **Ability to communicate with their customers:** Farmers currently using digital platforms for trading/marketing or to process payments rely heavily on their platform’s ability to conduct email marketing or collect emails. They use these features to market their products to customers, share their operation’s story and purpose, and communicate with them if any problems arise with their transactions. The ability to share their broader story is particularly important for farms that also operate as nonprofits and rely on donors. Another feature that would be important is the ability for customers to contact the farmers and provide feedback. Because it might lead to relationship building, farmers are interested in keeping the lines of communication with customers open and offering them product support even after a transaction has been completed.
- ▶ **Privacy and security for farmers and their customers:** Farmers acknowledged that privacy and security concerns are always present when giving a third party access to their information. Some expressed taking action to prevent their payment systems from recording some customer information and receiving positive feedback from customers about these actions.
- ▶ **Cybersecurity:** Farmers perceived cybersecurity threats as an inherent part of an increasingly digital business environment. Therefore, they stay vigilant against compromised accounts and passwords.
- ▶ **Excellent customer service/support by the platform developers:** This was the primary concern for the farmer not currently using a trading/marketing platform but considering one. Because the farmer is new to using these platforms, that farmer would want a “learning partner” to develop a business partnership with, and who would help grow online sales. Ideally, a person or a responsible party will reply in a timely fashion if an issue arises, so that the farmer can promptly respond to customers. When considering the potential use of some platforms and comparing them, the farmer has found some platforms to be similar in terms of features but different in terms of customer-service quality.
- ▶ **Training and technical assistance opportunities:** Farmers were concerned about access to training opportunities regarding the platforms. For example, farmers could learn topics such as how to track vendor orders or repopulate past accounts with the help of live customer service or through training and technical assistance opportunities.
- ▶ **Interoperability:** Farmers discussed the importance of their trading/marketing platforms being able to work/connect with other accounting, record-keeping, or production systems used on the farm (in other words, interoperability). Farmers who use QuickBooks for record keeping and have more experience with

digital trading/marketing platforms had not utilized any interoperability features of their record-keeping systems. They expressed some reservations about connecting transaction information from one platform to another. Farmers who use QuickBooks for record keeping and have less experience with digital trading/marketing platforms thought interoperability would be important to them.

Communicating Farm and Product Attributes to Buyers

The farmers agreed that the importance of communicating farm and product attributes to buyers through a trading/marketing platform depended on what their buyers wanted, their location, and their relationship with them. They agreed that different buyers place different emphasis on farm and product attributes, such as local or regional, organic, and environmental sustainability, and any related third-party certifications. They perceived corporate buyers to have less emphasis on the story of their farms relative to smaller, local buyers. One farmer who decided to quit selling to organizations requiring GAP shared the farm’s experience developing long-term relationships with buyers. Once the farmer established a business relationship and buyers felt confident about the quality of the operation’s produce, some buyers would prioritize transacting in the easiest way possible and perhaps minimizing paperwork over requiring attribute certification. Another farmer selling USDA-certified organic produce shared that farm’s experience trying to reach urban buyers who value organic certification. For this farmer, it is important to be able to communicate the farm’s certified status, sustainability practices, and projects to support the local community. The farmer would like a platform that helps communicate ongoing educational efforts on the ground related to young farmer support, health and nutrition, food and mood, mental and physical health, and recipes and food preparation. The farmer believes that the ability to conduct education-based marketing through a digital platform—for example, by sharing online recipes with buyers—would be essential to the operation.

Impacts of the COVID-19 Pandemic

Farmers observed the repercussions of the COVID-19 pandemic regarding the temporary or permanent closure of many restaurants and food service institutions and the negative impact those closures had on fresh-produce suppliers. Some farms emphasized online sales, while others downsized or closed permanently. One farmer who focused on online sales found the switch from a couple of larger clients to hundreds of smaller clients to be more

labor-intensive but charged a small premium to offset the extra labor cost. Another farmer, who did not rely on online sales due to a lack of funds to hire labor to assist with delivery logistics, chose to downsize and focus on fewer market outlets instead. This farmer switched from individual orders and a large produce distributor to sales through farmers' markets, produce coops, and food hubs. However, the farmer is still interested in expanding, hiring more labor, and selling online in the future.

Use of Marketing Contracts/Agreements

All farmers use or had used verbal or informal agreements instead of written or formal contracts. Their experiences with informal agreements were mixed and depended on whether they had an established relationship of trust with their buyers. If formal contracts are an option, farmers believe these would be important if they could sell higher volumes to wholesalers or to buyers with whom they did not have an established trust relationship. The use of formal contracts would also be important to farmers if the transaction involved specific/custom product requests for which they had to considerably invest additional time and resources (such as land, a greenhouse, climate control technology, and the required utilities). Depending on the parties' risk tolerance, the higher their perceived risk from these transactions, the more they favor formal contracts. Their primary concerns would be guaranteeing a purchase at a minimum price and defining payment terms.

Though their current focus is direct-to-consumer sales, farmers with established trust relationships had been able to successfully enter verbal understandings for bulk purchases with chefs, grocery stores, and other food-service institutions. Some of the attributes agreed upon included quality specifications, payment method, delivery and packaging requirements, and delivery time. One farmer, who had to back out of discussions around a formal contract due to lack of processing capacity, recalled that the terms of the contract involved processing specifications (for example, number of washes, bagging specifications, poundage) and payment method and turnaround. Other farmers, who had tried verbal agreements with wholesalers with whom they did not have an established relationship and who had experienced product rejection and receiving below-market prices long after delivery, were enthusiastic about using formal contracts if they were to sell wholesale in the future. Some of the contract attributes important to farmers would be a guaranteed purchase at a minimum price, ideally before the farm commits to growing the crop, and knowledge about the penalties if the parties did not fulfill the contract. Farmers do not think an upfront payment would be needed if the contract stipulates guaranteed product purchase.

In terms of barriers to contract farming, the farmers mentioned that many buyers do not offer contracts. They discussed potential business closures, a preference for flexibility, and the uncertainty linked to the COVID-19 pandemic or supply chain disruptions as reasons for restaurateurs not wanting to enter formal contracts at the moment. As reasons for farmers not wanting to enter formal contracts, they mentioned the potential difficulty of ensuring product delivery due to weather uncertainty, a preference for flexibility, and the presence of trust in the seller-buyer relationship. In addition, farmers expressed hesitancy to trade the price premiums they might capture when selling smaller quantities directly to consumers for the lower prices they might receive for selling larger quantities to wholesalers. Farmers believed that spot transactions might help keep transactions simple for small-scale growers, and, if they did not receive payment, they could stop product delivery and search for alternative buyers. While small-scale farmers might be considered price takers, one farmer considered that, because of the quality of the farm's products, the operation has captured a share of the local market that allows the farmer to decline transactions if the buyer's valuation does not match the prices set for the products. This farmer expressed setting prices such that the operation is profitable and can pay laborers a living wage. The farm's current strategy also entails sharing its story, promoting the quality of its products, focusing on customer service, and finding buyers whose values align with the values of its operation. Another farmer producing in an urban setting observed that, while produce supply has been growing in the area over the last few years, there is still strong demand for that farmer's products.

Knowledge and Potential Use of Blockchain Technology

All farmers had heard about blockchain before, but their level of familiarity with the technology varied. Familiarity with blockchain technology ranged from minimal ("I have heard the word blockchain in relation to Bitcoin or cryptocurrencies") to very familiar ("I am very knowledgeable about blockchain applications in different industries"). One farmer explained that blockchain is a decentralized record of transactions not being monitored by any centralized entity. The grower is uncertain about the role of blockchain in agriculture, except for the use of cryptocurrencies in payments but understands that the technology started with cryptocurrencies and that several applications have rippled since then. Another farmer explained that blockchain is a ledger of transactions tied into blockchains like Ethereum, that these ledgers are thought to be more transparent, and that blockchain technology also ties into smart contracts.

After a brief overview of the key features of blockchain and how it relates to smart contracts, most farmers expressed that they would feel comfortable/secure if their information were stored in a blockchain-based trading/marketing platform. One farmer expressed having minimal knowledge of the technology but would lean toward trying this platform type based on the other farmers' discussion. The group's concerns about the functionality of blockchain applications in agri-food supply chains included a need for better understanding the technology, the use of the technology potentially resulting in solutions that are harder (or slower) than the problem they are trying to solve, the cost and transaction fees associated with blockchains using proof of work as the consensus mechanism, the possibility of the transaction fees for accepting cryptocurrency as a payment method being higher than those of their current payment solutions (Venmo tag or Cash App's Cashtag), and the long-term sustainability of these applications. They acknowledge that transaction fees might vary from one blockchain ledger to another, and ledgers such as Ethereum are considering switching their consensus mechanism to proof of stake, which might lower transaction fees. However, they still believe that blockchain-based trading/marketing platforms might be better suited for transactions with institutional buyers over direct-to-consumer purchases. Farmers inquired about companies that have developed a platform with smart contracts to transact in the agricultural space, and the interviewers highlighted some applications: Morpheus Network for supply chain management/digitization, Australian-based AgriDigital, and IBM Food Trust, which has been tested or adopted by large food companies such as Walmart, Kroger, and Sysco. Though most current applications of blockchain might be focused on food traceability, more applications in the smart contract arena are emerging.

Internet Access and Familiarity with Mobile Applications

Most farmers expressed feeling comfortable or very comfortable using mobile applications in general (not necessarily blockchain-based). One farmer's level of comfort depended on the reputation of the application developer, the application's customer service, and its cost. In terms of internet connectivity, all farmers viewed internet access as an issue for both rural and urban locations. The farmers located in more rural areas experience connectivity issues in their farms and their routes to urban settings. The farmer located in a more urban area estimates that about 18 percent of households in that community have hard-wired internet in their homes. While there have been local investments, and the farmer is actively searching for solutions to improve the farm's connectivity, reliable internet access remains a challenge. The farmer believes that the low rate of usage paired with a low ability to afford the service in the area results in limited offerings by providers.

As the use of digital technologies in agriculture continue to grow, small and medium-scale operations need access to the information and tools that will allow them to identify affordable and profitable marketing strategies and stay competitive in the market. Improvements to high-speed and reliable internet access will be increasingly important to improve farm productivity and facilitate farmers' adoption of production and marketing technologies needed in today's digital world.

References

Organizations:

AgLaunch: <https://aglaunch.net/>

Certifications:

Good Agricultural Practices (GAP): <https://www.ams.usda.gov/services/auditing/gap-ghp>

USDA Organic certification: <https://www.usda.gov/topics/organic>; <https://www.ams.usda.gov/services/organic-certification>

Certified Naturally Grown (CNG): <https://www.cngfarming.org/>

Digital Trading/Marketing Platforms:

Barn2Door: <https://www.barn2door.com/>

Farmigo: <https://www.farmigo.com/>

Local Line: <https://growingfarmers.localline.us/>

Shopify: <https://www.shopify.com/>

Digital Payment Platforms:

Cash App: <https://cash.app/>

PayPal: <https://www.paypal.com/us/home>

Square: <https://squareup.com/us/en>

Venmo: <https://venmo.com/>

Acknowledgments

We gratefully acknowledge funding from the Foundation for Food and Agriculture Research via the Open Market Consortium for Specialty Crops and thank the farmers in the AgLaunch Farmer Network for their valuable input provided during the focus group.

Publication 3752 (POD-04-22)

By **Alba J. Collart**, PhD, Associate Extension Professor, and **Elizabeth Canales**, PhD, Assistant Professor, Department of Agricultural Economics.

Copyright 2022 by Mississippi State University. All rights reserved. This publication may be copied and distributed without alteration for nonprofit educational purposes provided that credit is given to the Mississippi State University Extension Service.

Produced by Agricultural Communications.

Mississippi State University is an equal opportunity institution. Discrimination in university employment, programs, or activities based on race, color, ethnicity, sex, pregnancy, religion, national origin, disability, age, sexual orientation, gender identity, genetic information, status as a U.S. veteran, or any other status protected by applicable law is prohibited.

Extension Service of Mississippi State University, cooperating with U.S. Department of Agriculture. Published in furtherance of Acts of Congress, May 8 and June 30, 1914. GARY B. JACKSON, Director

