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## Evaluating Success Factors and Challenges Among Small-Scale Agricultural Producers: A Texas Case Study

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# Evaluating Success Factors and Challenges Among Small-Scale Agricultural Producers: A Texas Case Study

## Cover Page Footnote

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# Evaluating Success Factors and Challenges Among Small-Scale Agricultural Producers: A Texas Case Study

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## ABSTRACT

Literature on small farms in the U.S. is limited though they are the most numerous farm type, generate over twenty percent of agricultural production, and are more likely to be operated by historically underserved (i.e., beginning, minority, veteran, women, young) farmers than large-scale farms. This article details an online survey study of small-scale agricultural producers using a purposive sample from Texas. We used crosstabulations to evaluate qualitative operational and demographic (e.g., age, gender) factors of success, finding several significant variables with moderate effect sizes. Generally, producers regarded quality of life as more important to success than profitability. Producers' top challenges were capital, production, marketing, legal, financial, informational, and social, in that order. While results may not be representative of all small producers, in Texas or otherwise, they provide an important look at an understudied population who contribute meaningfully to sustainable production, local and regional food systems, and overall agricultural structure.

## KEYWORDS

Beginning farmers, first-generation farmers, small farms, success factors, Texas

## INTRODUCTION

Compared to large farms, small farms (defined as farms with gross cash farm income below \$350,000) make up a substantially higher share of total farm operations in the United States (90 percent), face greater financial risks, and are more likely to rely on off-farm income (Whitt, Todd, and MacDonald 2020). Perhaps due to their large numbers and heterogeneity, small-scale agricultural producers (hereafter small producers) are rarely the subject of academic inquiry (Iles, Ma, and Erwin 2020; Tritsch et al. 2021). However, as the average age of farmers continues to rise, more farmland prepares to change hands, and we seek out more environmentally sound production practices, understanding success factors and challenges of small producers may prove important. Small farms are regularly considered key components of local food or alternative agriculture systems (Janssen 2018), and the USDA National Commission on Small Farms (1998, p. 16) once described small farms as “the foundation of our Nation.” The 24-year-old report from the USDA National Commission on Small Farms (1998) detailed the structural discrimination of federal programs and policies against small farmers, largely citing problems of increasing consolidation leading to unfair markets. Consolidation has increased in several agricultural sectors including production of row crops, vegetables, dairy, eggs, and hogs (MacDonald, Hoppe, and Newton 2018), as well as meat processing and inputs like seeds and fertilizer (Hendrickson et al. 2020).

Texas has a high proportion (over 93 percent per 2017 US Census of Agriculture data) of small family farms. This study was developed to better understand the challenges and success factors of small farmers. We used survey responses from a non-probability sample (n=48) of Texas small producers to identify demographic and operational factors impacting small producers’ perceptions of success, as well as their predominant challenges and predictors.

## LITERATURE REVIEW

There is not an agreed upon definition of success in agriculture. For some producers, success may be scratching out a living on the land, and for others it may be the ability to purchase more acreage and expand their business. It may not be reasonable to define success for the vast number of small producers in the U.S., but social researchers have revealed some commonalities. A literature review from Tritsch et al. (2021) explained how traditional financial measures of success fail to paint a complete picture of small farm success from producers’ perspectives. Small producers

generally value financial measurements like positive cashflow, net worth, and profitability, but also identify success in qualitative terms, like “love of farming” (Yeboah, Owens, and Bynum 2009:5) or “contentment/satisfaction” (Cuykendall, LaDue, and Smith 2002:15). While financial success is important, it may not be the prime motivator or indicator of success for small producers (Cuykendall et al. 2002; Tritsch et al. 2021; Yeboah et al. 2009).

Researchers have uncovered several variables that may impact the success of small producers, including attention to detail (Muhammad, Tegegne, and Ekanem 2004), government policies (Nanhou 2001), low/manageable debt load (Shepherd 2014), and workshop participation (Yeboah et al. 2009). Small farm success has been analyzed using a number of demographic (e.g., age, race), operational (e.g., marketing type, debt load), and external (e.g., policies, training) factors. Success is conceptually difficult to measure, as the researcher(s) are in the position to define and interpret it within their studies. Some small farm success factor studies have measured success in terms of profitability, but more often they use a form of self-assessment (Tritsch et al. 2021). For example, in our survey, we asked producers to what extent they agreed with the statement: “My farm or ranch is successful,” thus allowing producers to define success on their own terms. This methodology certainly creates room for discrepancies, and it may be that success is better addressed using qualitative methods like Pool (2014), who found that small producers defined success in multiple dimensions (financial, operational, quality of life, social).

Very few studies explicitly address *small* producer challenges, but researchers have addressed challenges among producers generally and for specific groups such as women farmers (Keller 2014), African American farmers (Asare-Baah, Zabawa, and Findlay 2018), and underserved sustainable producers (Kleiner and Green 2008). Tritsch et al. (2021) identified seven distinct challenge categories among producers based on a review of seven needs assessments, which informed the ranking exercise in our survey instrument (capital, financial, informational, legal, marketing, production, and social). Of the seven needs assessments, only two were specific to small farms. Producers faced a variety of challenges, from access to markets (Bramwell et al. 2016; King 2016), to finding appropriate and relevant information (Goodwin and Gouldthorpe 2013), to land and capital acquisition (Carlisle et al. 2019). Personal challenges, such as time management and balancing on- and

off-farm employment, may be an additional category worth considering (Iles, Ma, and Nixon 2021).

Historically underserved producers, which include limited resource, beginning, socially disadvantaged, and veteran farmers according to the Natural Resources Conservation Service (NRCS), tend to operate smaller farms in terms of annual sales and/or acreage compared to the U.S. average, as do women and young farmers (Congressional Research Service 2021; USDA Economic Research Service 2021). Therefore, studies exploring the unique challenges of these populations may provide some insight into challenges faced by small producers.

Beginning farmers and ranchers are those who have been farming for ten years or less. They tend to be younger than the national average and are more likely to be female and non-white compared to established producers (Ahearn and Newton 2009). Startup costs and land access are two of the primary barriers facing beginning farmers (Ahearn and Newton 2009), as well as securing markets (Calo 2018). Young farmers, those aged 35 or less, face similar obstacles. In a survey of 3,517 current and aspiring young farmers under the age of 40, top cited challengers were land access, servicing student loan debt, securing skilled labor, and finding affordable health insurance (Ackoff, Bahrenburg, and Shute 2017).

Socially disadvantaged farmers and ranchers (which generally refers to racial or ethnic minorities and sometimes women) face further barriers to entry in agriculture. In addition to operating smaller farms that generate less revenue, farmers of color must reckon with historical discrimination from USDA loan offices, and in some cases grapple with land title issues that make qualifying for loans problematic (Government Accountability Office 2019). These challenges are amplified for immigrant, refugee, and multicultural producers with limited English language proficiency and/or legal statuses that prevent them from accessing land or other supportive resources (Calo 2018; Ostrom, Cha, and Flores 2010). While a qualitative case study found that overt racial discrimination was not an overwhelming concern among young Black farmers, lack of representation in agricultural communities was a common experience among participants (Touzeau 2019).

Women farmers are a growing population, though recent changes in USDA reporting may cause researchers to “overestimate [their] success in agriculture” (Pilgeram et al. 2020). Women farmers have cited challenges related to identity and recognition, as well as accessing capital (Ball 2020; Keller 2014). Like young and beginning farmers, women farmers tend to rely on off-farm work for household income, at least in part

because they tend to operate very small farms (Hoppe and Korb 2013). Though research on gender inequalities in U.S. agriculture is mixed, farming claims one of the largest gender/wage gaps in the country (Fremstad and Paul 2020).

Veteran farmers appear to be extremely underrepresented in academic literature. Several programs explicitly serve veteran farmers, including the Farmer Veteran Coalition, the National AgrAbility Project, and Farmers Assisting Returning Military (F.A.R.M.). For some veterans, farming and military service have parallels and complementarity; farming provides a sense of purpose and therapeutic value post-service and calls on values like competency and self-sufficiency that resonate with prior service members (Tidball 2018). There are well-documented therapeutic benefits of community agricultural programs; one such program in Washington found that a farming program using a “peer support model” elicited positive changes in veterans’ communication, relationships, involvement, wellness, and reintegration to society (Brown et al. 2016).

Overall, small producers face a wide variety of challenges, particularly when they are part of a historically underserved group. However, without a comprehensive demographic study or reliable statistics on farming subpopulations, it is difficult to assess how overlapping producer categories stack up. This article focuses explicitly on the success factors and challenges of small-scale agricultural producers. We sought to answer the following research questions: 1) what are the predominant challenges facing Texas small producers 2) which factors influence their success and their challenges, and 3) how do they define and interpret success? Methods in this study can be adapted and improved by social scientists to help us better understand the unique circumstances facing small, alternative – and in this case, largely first generation and beginning – farmers.

## METHODS

We used a web-based survey software, Qualtrics, to design and distribute an online survey to a sample of Texas small producers. The objective of the survey was to identify the predominant challenges faced by small producers and determine which factors influence their challenges and self-perceived success. Texas State University’s Institutional Review Board (IRB) provided approval (#6598) in September 2019, and the survey was disseminated in January and February 2020.

We aimed to limit the survey to thirteen minutes or less to increase response rate (Pennings, Irwin, and Good 2002), and ended with a total of

66 questions. Respondents had to be eighteen years of age or older, operate a farm or ranch in Texas, and have gross farm sales of less than \$350,000 annually to take the survey. We chose \$350,000 as the threshold for small producers to align with USDA typology (Whitt et al. 2020).

Farm characteristics and operator demographics were included as potential factors influencing small producers' challenges and level of success (e.g., types of product(s), acreage, demographics). We asked qualitative questions about profitability, quality of life, and predominant challenges facing Texas small producers. We used the seven challenge categories from Tritsch et al. (2021) to implement a ranking exercise in the survey instrument (i.e., capital, financial, informational, legal, marketing, production, and social).

Small producers as a whole are not "formally organized," which makes representative probability sampling difficult, if not impossible (Pool 2014:56). Like the web survey of Texas farmers conducted by Barbieri and Mahoney (2009), we used non-probability sampling methods to construct a list of Texas small producers. We compiled a list of small producers using registrant information from the 2019 Farm and Food Leadership Conference (n=130) and individual producer connections made by the Central Texas Young Farmers Coalition (n=5) and the Texas Farm Bureau Small Farm and Ranch Committee (n=1). The survey was open for approximately eight weeks with automatic reminders for non-respondents. The survey received a total of 56 completed responses, however eight responses were removed because respondents failed to advance through screening questions or did not complete the survey in its entirety, resulting in a total of 48 usable responses and a 35 percent response rate. It should be noted that seven respondents reported gross annual farm sales of less than \$1,000, which technically bars them from being considered a farm per USDA definition. However, due to the limited number of responses and exploratory nature of the survey, their responses were included in the results section.

We used descriptive statistics, primarily crosstabulations, to analyze relationships between nominal variables in our survey data. First, we compared National Agricultural Statistics Service (NASS) state level data to sample demographics to investigate any significant differences between populations. We tested age, race, gender, military service, and years of experience using a weighted case chi-square analysis in SPSS Statistics 26. We weighted data by counts for each variable and then ran chi-square analysis using crosstabulations by group and location. Due to



our small sample size, we chose to use Fisher's exact method (Lydersen et al. 2007). While we provide the results of these significance tests, due to our use of a non-probability sample, we recommend readers exercise caution in interpreting these results. We also provide measures of effect size using Cramer's V for success and challenge factors.

## RESULTS

Results are separated into three sections. The first section provides a summary with descriptive statistics about respondent demographic characteristics and farm characteristics. The second section investigates factors of success based on producer self-assessment, and the final section investigates predominant challenges and their predictors.

### *Summary Statistics*

Overall, respondents were well-educated, relatively new to farming, tended to identify as white and male, and mostly resided in central Texas. Survey respondents represented a total of 33 Texas counties. Table 1 shows the difference in population proportions between all Texas producers and survey respondents by demographic categories. Due to data availability limitations, comparison data is provided for all Texas producers rather than solely small producers. Compared to the statewide population, our sample featured significantly higher proportions of younger ( $p < 0.01$ ) and beginning farmers ( $p < 0.01$ ).

Among respondents, 72 percent of respondents were first-generation farmers and 59 percent were beginning farmers reporting less than ten years of farming or ranching experience. There was a nearly even split among respondents' primary occupations, with 52 percent reporting farming as their primary occupation and 48 percent reporting an off-farm job as primary. Most respondents (60 percent) reported holding an off-farm job, predominantly because off-farm work was more lucrative (26 percent), provided healthcare benefits (19 percent), or provided retirement benefits (14 percent).

Respondents tended to diversify their product types, use sustainable practices, and operate small acreage. Respondents mostly produced vegetables (18 percent) followed by livestock for meat (12 percent), livestock for sale (11 percent), and eggs (11 percent). Livestock producers who raised animals for meat primarily owned cattle, goat/sheep, and poultry. Other product types included production of mushrooms, cut flowers, honey, and wildlife.

Table 1: Comparing Population Proportions of All Texas Producers and Survey Respondents

Category	% Texas	% Survey	$\chi^2$
Age			36.290 <sup>**a</sup>
25-34 years	5	23	
35-44 years	10	23	
45-54 years	18	11	
55-64 years	28	30	
65 years or older	38	13	
Gender			0.095
Male	62	60	
Female	38	40	
Race			11.032 <sup>a</sup>
Hispanic or Latino <sup>b</sup>	10	11	
Native American or Alaska Native	1	2	
White or Caucasian	95	83	
Biracial or Multiracial	1	4	
Education			--
Some college	--	23	
College degree	--	49	
Graduate degree or higher	--	28	
Military service			0.181
Yes	13	15	
No	87	85	
Years of experience			22.755 <sup>**</sup>
0-5 years	15	36	
6-10 years	14	23	
11 years or more	71	17	
First generation farmer			--
Yes	--	72	
No	--	28	
<i>n</i>	408,506	47 <sup>c</sup>	

Note. Texas producer numbers based on all producers from USDA NASS, State Level Data: Texas, Table 52. Not all percentage calculations may add up to 100 percent due to rounding; <sup>a</sup> Fisher's exact test result is reported instead of Pearson's chi-square statistic. <sup>b</sup> Hispanic or Latino origin is reported separate from other racial categories in NASS data. <sup>c</sup> One survey respondent chose not to answer demographic questions (n=47).

†p<.10, \*p<0.05, \*\*p <0 .01, \*\*\*p<0.001

Most survey respondents operated less than 50 acres. About a third (31 percent) of respondents operated less than ten acres and another 27 percent operated between 10 and 49 acres. Only two respondents operated 1,000 acres or more. Most respondents neither rented land (70 percent) nor leased their own land to someone else (90 percent), indicating that most respondents were both landowners and operators. Only 8 percent (n=4) of respondents reported being certified organic. However, nearly 96 percent of respondents indicated that they

used sustainable practices on their farm or ranch (yes/no). Respondents who answered “yes” were then asked to select what sustainable practices they used; respondents indicated a total of 155 practices, suggesting that these Texas small producers implement multiple sustainable practices concurrently (mean=3.23). In terms of informational resources, respondents indicated that other farmers, organizations or associations, and farm magazines were their primary sources. In the “other” category, most respondents cited online sources such as the internet, YouTube, social media, and podcasts.

Only 8 percent of received crop insurance subsidies, price support, or disaster payments, while almost 21 percent participated in federal conservation programs. In a multiple selection question, respondents provided a total of 116 marketing arrangements, suggesting that these Texas small producers are diversified in their marketing strategies. Respondents sold primarily through direct marketing such as farmers’ markets, farm stands, and community supported agriculture (CSA) initiatives. Other marketing arrangements included word of mouth, livestock auctions, stockyards, and direct to gin/elevator. No survey respondents used marketing contracts, and the majority (94 percent) did not use forward sales or price setting agreements.

The sample featured higher percentages of producers in the \$10,000-\$99,999 range and lower proportions of very small producers with less than \$2,500 in gross annual sales. Only 21 percent reported that they were profitable in the past year. When asked about their future, respondents overwhelmingly indicated that they wanted to expand their operation’s size or enterprises (74 percent) and several others indicated that they planned to maintain current levels of production (12 percent). Open-ended answers regarding future plans included passing the farm down to future generations, diversifying production, and adding an agritourism enterprise.<sup>1</sup>

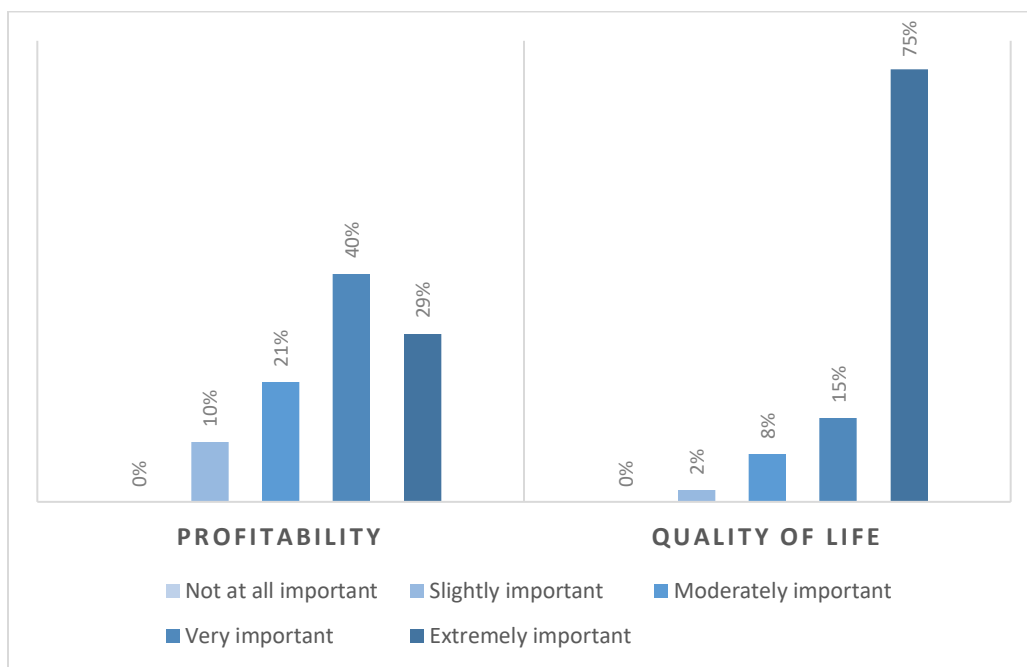
### *Small Producer Success*

Respondents were asked to indicate how much they agreed or disagreed with the statement “My farm or ranch is successful” on a five-point Likert scale (1=strongly disagree, 5=strongly agree). Table 2 shows the results of manually recoding the values in terms of success. Fifteen percent of respondents indicated a lack of success on some level, 33 percent did not agree or disagree, and 53 percent reported being successful on some level.

**Table 2: Self-Assessed Success of Survey Respondents (n=48)**

Description	n	%
Unsuccessful	7	14.6
Neither	16	33.3
Successful	25	52.1

We asked producers about quality of life and profitability to examine how they perceived economic or social components to success. Quality of life concerns were a unifying factor among survey respondents (Figure 1). Ninety percent of respondents indicated that quality of life was either extremely or very important to their success while only 69 percent indicated that profitability was extremely or very important to their success (Figure 2).



**Figure 1: Respondent Perceptions of Quality of Life versus Profitability in Relation to Self-Perceived Success (n=48)**

Table 3 summarizes results from Fisher’s exact tests comparing success level (unsuccessful, neither, successful) with selected farm and operator characteristics. We chose Fisher’s exact over asymptotic Pearson’s chi-square tests due to our small sample size (Lydersen et al. 2007). Test results suggest that use of hired labor, profitability, and years of experience are moderately associated with producers’ self-perceived success, based on both p-values and effect sizes measured through Cramer’s V. Respondents who identified their farms or ranches as

successful were more likely to use hired labor, self-report as profitable, and have over 10 years of experience. These findings overlap slightly with Shepherd (2014), who found that more years of experience and use of hired labor were positive and significant success factors.

Table 3: Bivariate Relationships between Farm and Operator Characteristics and Self-Perceived Success (n=48)

Variable	Unsuccessful (%)	Neither (%)	Successful (%)	Total (%)	Fisher's exact test statistic	Cramer's V
<b><u>Farm variables</u></b>						
Farm acreage						
Over 50 acres	5.0	30.0	65.0	100.0	3.187	0.265
Under 50 acres	21.4	35.7	42.9	100.0		
Use of hired labor						
Always or sometimes	8.6	28.6	62.9	100.0	6.905*	0.381
Never	30.8	46.2	23.1	100.0		
Use of bookkeeper or accountant						
Yes	0.0	38.5	61.5	100.0	2.921	0.252
No	20.0	31.4	48.6	100.0		
Use of debt						
Yes	22.2	33.3	44.4	100.0	1.525	0.175
No	10.0	33.3	56.7	100.0		
Marketing						
Direct	15.6	35.6	48.9	100.0	2.944	0.248
Wholesale	0.0	0.0	100.0	100.0		
Profitability						
Profitable	0.0	20.0	80.0	100.0	8.054†	0.309
Broke even	6.3	31.3	62.5	100.0		
Unprofitable	27.3	40.9	31.8	100.0		
<b><u>Operator variables</u></b>						
Years' experience						
Less than 10 years	17.9	39.3	42.9	100.0	6.911†	0.310
Over 10 years	5.3	26.3	68.4	100.0		
Race					4.824	0.275
White	15.4	33.3	51.3	100.0		
Non-white	0.0	37.5	62.5	100.0		

Note. Table represents sample of variables tested. Row percentages displayed.

†p<.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

### *Small Producer Challenges*

The survey asked about producer challenges in two ways. First, respondents were asked about each challenge category independently; they were asked to indicate whether each category was challenging (yes/no), to what degree it was challenging, and to provide examples within each category. At the end of the survey section on "Farm

Challenges,” respondents were also asked to answer a summary question about which single category they found most challenging. Table 4 shows the top challenges by initial frequency count (respondents that indicated “Yes, this is a challenge”) and corresponding difficulty rating. Prior to the summary question, the top challenges indicated by respondents were production (71 percent), legal (69 percent), and capital (67 percent) challenges. Marketing had the highest difficulty rating overall (3.63 out of 5).

**Table 4: Frequency and Difficulty of Challenge Categories Faced by Survey Respondents with Specific Issues Identified (n=48)**

Challenge categories	Percent identifying category as a challenge	Average difficulty rating (1-5 scale)	Top three issues
Production	71	3.29	Soil health; crop pests and diseases; weed management
Legal	69	3.21	Food safety regulations; voluntary food safety programs; organic certification
Capital	67	3.50	Access to equipment; securing loans or other external funding; finding labor
Financial	60	3.45	Accounting; cashflow projections; recordkeeping
Marketing	56	3.63	Direct marketing techniques; advertising and labeling; lack of consumer education
Informational	38	3.28	Cannot afford to attend events; do not have time to attend events; lack of workshops or training
Social	33	2.94	Family relations; training and managing labor; retaining labor

Figure 2 graphically illustrates the difficulty ratings of each challenge category, demonstrating that marketing and capital have the highest proportions of highly to extremely challenging ratings from respondents. In the summary question, respondents indicated that capital (31 percent), production (25 percent), marketing (21 percent), and legal (15 percent) challenges were the most difficult overall. Across all

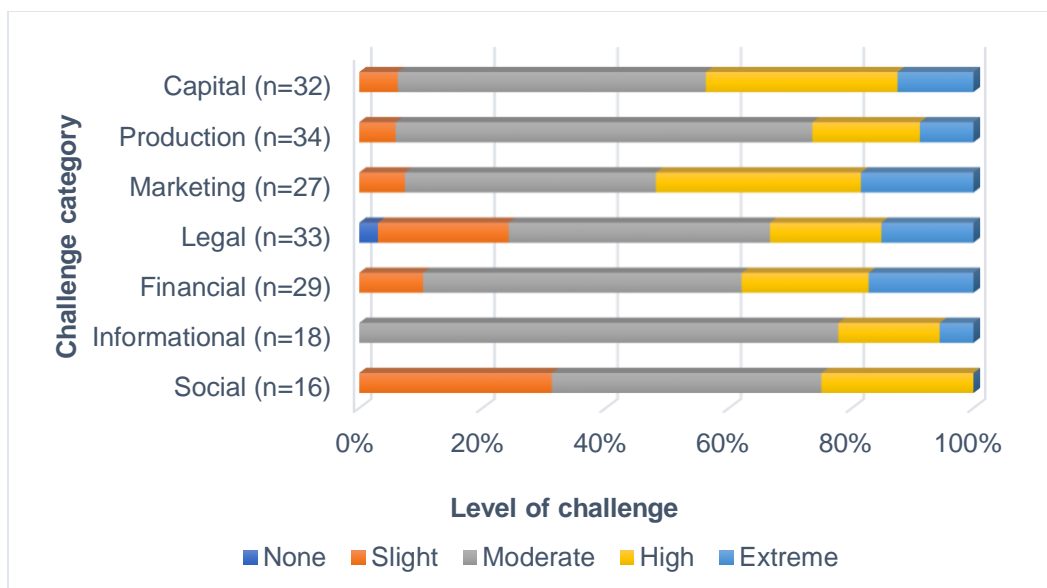


Figure 2: Summary of Likert Scale Responses from Producers on Most Challenging Category Overall

measures, survey data suggest that capital, production, marketing, and legal represent the most challenging categories for these Texas small producers.

Finally, we used Fisher's exact method and Cramer's V to explore relationships between predominant challenge categories and farm and operator characteristics (Table 5). Self-perceived success, profitability, and gender were moderately associated with top challenges. Producers that identified as successful were somewhat more likely to choose capital (36 percent) as their top challenge compared to other categories (12-20 percent). Producers that did not identify as successful were most likely to choose production as a top challenge (71 percent), with the remainder choosing capital (29 percent). Respondents in the "neither" category were relatively evenly split, with marketing as the highest at 31 percent. The top challenge among profitable producers was capital challenges (30 percent). Thirty percent of profitable respondents also fell into the "other" category, which was categorized by bottom three challenge categories (financial, social, or informational). Forty-one percent of unprofitable producers struggled with production and the second highest challenge category was marketing at 27 percent. Respondents that self-reported "broke even" were more likely to choose capital as their top challenge (50 percent). Finally, male producers were more likely to report capital as their predominant challenge compared to women (43 percent to 16 percent, respectively) while women reported production as more challenging by 22.5 percentage points. Male producers also constituted 100 percent of

“other” responses, while women only chose among the top four categories.

Table 5: Selected Bivariate Relationships between Farm and Operator Characteristics and Predominant Challenges (n=48)

Variable	Capital (%)	Production (%)	Marketing (%)	Legal (%)	Other (%)	Total (%)	Fishers test statistic	Cramer's V
Success								
Successful	36.0	16.0	20.0	12.0	16.0	100.0	11.954†	0.406
Neither	25.0	18.8	31.3	25.0	0.0	100.0		
Unsuccessful	28.6	71.4	0.0	0.0	0.0	100.0		
Profitability								
Profitable	30.0	10.0	20.0	10.0	30.0	100.0	13.459†	0.408
Broke even	50.0	12.5	12.5	18.8	6.3	100.0		
Unprofitable	18.2	40.9	27.3	13.6	0.0	100.0		
Gender								
Male	42.9	14.3	17.9	10.7	14.3	100.0	12.642†	0.354
Female	15.8	36.8	26.3	21.1	0.0	100.0		

†p<.10, \*p<0.05, \*\*p<0.01, \*\*\*p<0.001

## DISCUSSION

Survey results provide insight into a segment of the Texas agricultural population absent in academic literature: first-generation, young, beginning farmers who, according to their own perceptions<sup>2</sup>, are practicing sustainable agriculture. As these groups are underrepresented, survey results provide an important introduction to their diverse needs, challenges, and perceptions of success. The data suggests that small, historically underserved (e.g., beginning, minority, veteran, young, women) producers in Texas value quality of life and want to succeed economically but struggle with capital acquisition, sustainable production practices, direct marketing, and legal or regulatory constraints.

We found moderate associations between self-reported successful producers and the use of hired labor, profitability, and more years of experience, which was partially consistent with Shepherd (2014) and inconsistent with several other small farm success studies (e.g., Muhammad et al. 2004 found that race was a significant success factor). There are several reasons for mixed results. First, each study used a different methodology and survey instrument, which inevitably led to different answers. Collaboration to develop a reliable survey instrument on success factors among state, regional, or national researchers would likely



strengthen our understanding of what makes a small farm successful. Second, studies varied considerably in their sampling strategies. For example, it would not be prudent to directly compare the results of our convenience sample to the representative samples taken in Muhammad et al. (2004) and Nanhou (2001), though our results are still useful in the context of small producers. Lastly, the concept of success is inherently subjective and may change based on producers' backgrounds and motivations (Pool 2014).

Small producers who participated in the survey seemed to associate profitability with success, though higher percentages identified quality of life as an important factor in their success (Figure 1). This result is echoed by several small farm success factor studies, including Cuykendall et al. (2002), Pool (2014), Shepherd (2014), and Yeboah et al. (2009), who concluded that profitability was not the sole component of success to the small producers in their studies. Interestingly, 48 percent of survey respondents did not identify as successful, which could be indicative of quality-of-life issues for almost half of survey respondents.

Texas small producers predominately struggled with capital, production, marketing, and legal issues. The prevalence of capital challenges, plus majority of respondents' desire to expand their operations, may suggest a continued gap between small, historically underserved and/or sustainable producers and traditional agricultural services (e.g., Cooperative Extension, Farm Service Agency). Only 14 percent of survey respondents reported using Extension as an informational resource; this could be due to the documented divide between Extension's educational approaches and the needs and desires of small, sustainable producers (Ostrom et al. 2010).

We found moderate associations between respondents' top challenge and their self-perceived success, profitability, and gender. Unsuccessful, unprofitable, and women farmers were most likely to choose production as their top challenge, while self-perceived successful, profitable, "break even," and male producers were each more likely to select capital acquisition as their primary challenge.

## CONCLUSION

Because small farms make up most of the farm population and small producers have a critical role to play in the development and sustainability of local and regional food systems, understanding their challenges and successes is an important inquiry for academics, program officers, and decisionmakers alike. As empirical research on small-scale agricultural

producers is limited, this study adds important findings regarding their success factors, perceptions of success, and top-rated challenges. Adaptation and dissemination of this survey instrument to a representative sample of small producers on a state, regional, or national level would create a wealth of information. A comprehensive Economic Research Service (ERS) study on small producers, such as the one by Hoppe, MacDonald, and Korb (2010), would also prove useful in our understanding of this population.

Future researchers should consider establishing a contractual agreement with National Agricultural Statistics Service (NASS) to access a representative sample of small producers like Suvedi, Jeong, and Coombs (2010) in Michigan and Schattman et al. (2018) in Vermont. Future researchers may also consider establishing contractual agreements with agricultural nonprofits and/or service providers like Extension to access their producer contacts, like Yeboah et al. (2009) and University of Maryland Extension (2015; 2017). Representative sampling methods would provide a greater breadth of information on a poorly understood segment of agricultural producers, and would allow for stronger statistical interpretation of challenges, success, and their predictors.

Despite its subjectivity, success is a worthwhile measurement in terms of small farms. Since success factors vary considerably by study, it may be that there are no absolutes in the successful design and implementation of a small farm business. As small farmers are not homogeneous (Iles et al. 2020), it is likely different contexts require diverging farm, operator, and external characteristics to succeed. Indeed, this framing is more consistent with the precepts of sustainable or regenerative agriculture, which tend to promote values like diversification, context-based decision making, and long-term planning. Discovering patterns in the relative success of small farms is valuable to researchers, but it may be more prudent for practitioners to measure success relative to producers' goals (Ahearn 2016).

It is unclear what will become of small farms in the U.S., as large farms dominate production and therefore receive the bulk of government support (aside from conservation program payments). A plethora of USDA programs exist to provide training, technical assistance, and other types of support for small and historically underserved farms – from Farm Service Agency microloan programs to the Agricultural Marketing Service Farmers Market Promotion Program. However, results suggest there is a gap between program offerings and the needs of certain small producers. To ensure the continued existence and success of small farms, policies and

programs will need to address structural barriers, particularly land and capital access for young and beginning farmers (Ackoff et al. 2017; Calo 2018). Without the proper incentives, it is likely small farms will continue to dwindle in number or be cast aside as “hobby” operations. In this regard, institutional support can make or break the development of robust local and regional food systems, which are ultimately powered by small and mid-sized producers throughout the country.

## ENDNOTES

<sup>1</sup> Farm characteristic data is tabulated in Appendix B.

<sup>2</sup> Producers were asked whether they used sustainable practices on their farm. Sustainable agriculture was not defined, though we included practices in a follow-up question, which included: cover cropping, crop rotation, no-till, minimum or conservation tillage, integrated pest management, rotational grazing, or other.

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## APPENDIX A: Texas Small Producer Needs Assessment Questionnaire

Questions and answer choices are reflected below, but survey formatting, logic, and flow have been removed. An IRB informed consent page was included after screening questions.

### BLOCK 1: Screening Questions

1. Are you 18 years of age or older?
  - Yes
  - No (disqualifying)
2. Are you a farmer or rancher in Texas with gross farm sales of less than \$350,000/year?
  - Yes
  - No (disqualifying)

### BLOCK 2: Farm/Ranch Characteristics

1. What do you raise/grow on your farm for sale? Check off all that apply.
  - Oilseed or grain crops (corn, sorghum, wheat, etc.)
  - Cotton
  - Hay
  - Livestock (for sale)
  - Livestock (for meat)
  - Eggs
  - Dairy products
  - Vegetable crops (including melons)
  - Fruit crops (berries)
  - Fruit and/or nut crops (orchards)
  - Nursery or greenhouse production
  - Value-added products
  - Other, please specify:
2. In what Texas county is your farm or ranch located?
3. How many total acres do you operate?
  - 1-9 acres
  - 10-49 acres
  - 50-199 acres
  - 200-499 acres
  - 500-999 acres
  - 1,000 acres or more
4. Do you rent land from someone else to operate your farm or ranch?
  - Yes
  - No
5. Is any portion of your farm or ranch certified organic?
  - Yes, it is all certified organic
  - Only a portion of it is certified organic
  - No, it is not certified organic
6. Do you use sustainable practices on your farm or ranch? This includes cover cropping, conservation tillage, rotational grazing, etc.
  - Yes
  - I'm not sure
  - No

- i. If yes, what sustainable practices do you use? Please check all that apply.
    1. Cover cropping
    2. Crop rotation
    3. No-till
    4. Minimum or conservation tillage
    5. Integrated Pest Management (IPM)
    6. Rotational grazing
    7. Other, please explain:
7. In the past year, did your farm/ranch receive any government payments, e.g. federal crop insurance (FCIC), Agricultural Risk Coverage (ARC), Price Loss Coverage (PLC), or disaster payments?
  - Yes
  - No
8. In the past year, did your farm/ranch participate in any federal conservation programs, e.g. Conservation Reserve Program (CRP) or Environmental Quality Incentives Program (EQIP)?
  - Yes
  - No
9. Do you produce your agricultural goods under contract, i.e., production contracts?
  - Yes
  - No
10. Do you use forward sales or price setting agreements to market your products?
  - Yes
  - No
11. Does your farm or ranch use hired labor?
  - Always
  - Sometimes
  - Never
12. Does your farm or ranch have a hired manager?
  - Yes
  - No
13. Do you use a hired bookkeeper or accountant?
  - Yes
  - No
14. Which best describes the structure of your farm or ranch business?
  - Sole proprietorship
  - Legal partnership
  - LLC
  - Corporation
  - Cooperative
  - Other (nonprofit farm, association, etc.)
15. How do you sell your products? Please check all that apply.
  - Production contracts
  - Marketing contracts
  - Farmers markets
  - Farm stands
  - CSA program
  - U-pick program

- Online platforms
  - Direct to restaurants
  - Cooperative
  - Wholesale (to distributor, warehouse, or large retailer)
  - Other, please specify:
16. Where do you typically get information about production practices, technologies, etc.? Please check all that apply.
- Trade journals
  - Farm magazines
  - Newspapers
  - Extension service
  - Organizations or associations
  - Radio
  - Television
  - Neighbors
  - Other farmers
  - Other, please specify:
17. Please indicate how much you agree or disagree with the following statement... My farm or ranch is successful.
- a. Strongly agree
  - b. Somewhat agree
  - c. Neither agree nor disagree
  - d. Somewhat disagree
  - e. Strongly disagree
18. What were your gross farm sales last year? Gross farm sales are your total sales before taxes and expenses are taken out. This can be an estimate.
- Less than \$1,000
  - \$1,000-\$2,499
  - \$2,500-\$4,999
  - \$5,000-\$9,999
  - \$10,000-\$24,999
  - \$25,000-\$49,999
  - \$50,000-\$99,999
  - \$100,000-\$199,999
  - \$200,000-\$349,999
19. What were your total farm/ranch expenditures last year? Expenditures include labor, equipment, feed, inputs, etc. This can be an estimate.
- Less than \$1,000
  - \$1,000-\$4,999
  - \$5,000-\$9,999
  - \$10,000-\$19,999
  - \$20,000-\$49,999
  - \$50,000-\$99,999
  - \$100,000-\$499,999
  - \$500,000 or more
20. Have you incurred any debt to help fund the operation of your farm or ranch, including any loans incurred in previous years?
- Yes
  - No

21. About how much do you currently owe on loans or other debts to operate your farm or ranch business?
  - Less than \$1,000
  - \$1,000-\$2,499
  - \$2,500-\$4,999
  - \$5,000-\$9,999
  - \$10,000-\$24,999
  - \$25,000-\$49,999
  - \$50,000-\$99,999
  - \$100,000-\$199,999
  - \$200,000-\$349,999
22. Last year, was your farm or ranch business profitable?
  - My farm or ranch was profitable
  - We broke even
  - My farm or ranch was not profitable
23. To what extent is profitability important to your success as a farmer?
  - Extremely important
  - Very important
  - Moderately important
  - Slightly important
  - Not at all important
24. To what extent is quality of life important to your success as a farmer?
  - Extremely important
  - Very important
  - Moderately important
  - Slightly important
  - Not at all important

### BLOCK 3: Farm Challenges

1. Legal challenges: Understanding or complying with the legal requirements that apply to my operation.
  - Yes, this is challenge
  - No, this is not a challenge
2. Please indicate which legal issues pose a challenge for you. Check all that apply.
  - Food safety regulations, e.g., Food Safety Modernization Act (FSMA)
  - Voluntary food safety programs, e.g., Good Agricultural Practices (GAP)
  - Organic certification regulations
  - Labor regulations
  - Other, please specify:
3. Overall, how challenging are legal issues for your operation?
  - Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
4. Production challenges: Solving production issues like pests, diseases, yield, etc.
  - Yes, this is challenge
  - No, this is not a challenge

5. Please indicate which production issues pose a challenge for you. Check all that apply.
  - Crop pests and diseases
  - Livestock diseases or parasites
  - Livestock nutrition requirements
  - Crop fertility
  - Weed management
  - Soil health
  - Diversifying what I grow/raise
  - Other, please specify:
6. Overall, how challenging are production issues for your operation?
  - Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
7. Social challenges: Maintaining healthy relationships with family members, hired workers, or business partners.
  - Yes, this is challenge
  - No, this is not a challenge
8. Please indicate which social issues pose a challenge for you. Check all that apply.
  - Family relations
  - Hiring labor
  - Training and managing labor
  - Retaining labor from season to season
  - Power struggle among business partners and/or other operators
  - Other, please specify:
9. Overall, how challenging are social issues for your operation?
  - Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
10. Marketing challenges: Marketing and selling my product(s) to consumers.
  - Yes, this is challenge
  - No, this is not a challenge
11. Please indicate which marketing issues pose a challenge for you. Check all that apply.
  - Advertising, labeling, etc.
  - Direct marketing techniques
  - Wholesale marketing techniques
  - Keeping up with technology
  - Lack of consumer education about my product(s)
  - Product diversification
  - Other, please specify:
12. Overall, how challenging are marketing issues for your operation?
  - Extremely challenging
  - Very challenging

- Moderately challenging
  - Slightly challenging
  - Not challenging at all
13. Financial challenges: Managing my farm's finances like cash flow, debt management, or record-keeping.
- Yes, this is challenge
  - No, this is not a challenge
14. Please indicate which financial issues pose a challenge for you. Check all that apply.
- Cash flow projections
  - Recordkeeping
  - Accounting
  - Understanding financing options
  - Determining profitability
  - Using spreadsheets, software, or other technologies
  - Other, please specify:
15. Overall, how challenging are financial issues for your operation?
- Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
16. Informational challenges: Accessing the information, training, or technical assistance I need.
- Yes, this is challenge
  - No, this is not a challenge
17. Please indicate which informational issues pose a challenge for you. Check all that apply.
- I'm not sure where to look to find the resources I need
  - Lack of workshops or training in my area
  - Available resources don't meet my needs
  - Not time to attend educational events
  - Can't afford to attend educational events
  - Other, please specify:
18. Overall, how challenging are informational issues for your operation?
- Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
19. Capital challenges: Accessing the land, water, labor, equipment, or funding I need to start or expand my operation
- Yes, this is challenge
  - No, this is not a challenge
20. Please indicate which capital issues pose a challenge for you. Check all that apply.
- Land access
  - Water availability
  - Purchasing equipment
  - Securing loans or other external funding
  - Finding labor

- Other, please specify:
- 21. Overall, how challenging are capital issues for your operation?
  - Extremely challenging
  - Very challenging
  - Moderately challenging
  - Slightly challenging
  - Not challenging at all
- 22. Which category do you think is the most challenging?
  - Legal
  - Production
  - Social
  - Market
  - Financial
  - Informational
  - Capital

**BLOCK 4: Farmer/Rancher Demographics**

1. Is agricultural production (farming or ranching) your primary occupation?
  - Yes
  - No
2. Did you have an off-farm job in the past year?
  - Yes
  - No
3. Why did you choose to have an off-farm job? Check all that apply.
  - There was extra time for an off-farm job after farm/ranch work was completed
  - Off-farm work is more lucrative
  - Off-farm work is more reliable
  - Off-farm work provides healthcare benefits
  - Off-farm work provides retirement benefits
  - Low market prices for farm/ranch products
  - Commitment to off-farm employer
  - Other, please specify:
4. Are you a first-generation farmer?
  - Yes
  - No
5. How many years of experience do you have farming or ranching?
  - 0-5 years
  - 6-10 years
  - 10-15 years
  - Over 15 years
6. Did you work on other farms/ranches before your current operation? This includes unpaid work.
  - Yes
  - No
7. What is your highest level of completed education?
  - Less than high school
  - High school
  - Some college
  - Bachelor's degree
  - Graduate degree or higher

8. Are you a U.S. Military veteran?
  - Yes
  - No
9. What is your age bracket?
  - Under 25 years old
  - 25-34 years
  - 35-44 years
  - 45-54 years
  - 55-64 years
  - 65 years or older
10. What is your gender?
  - Male
  - Female
  - Non-binary
  - Prefer not to say
11. How would you describe your race/ethnicity? Check all that apply.
  - White/Caucasian
  - Black/African American
  - Hispanic/Latino
  - Asian
  - American Indian or Alaska Native
  - Native Hawaiian or Pacific Islander
  - Prefer not to say
12. Finally, what are your future plans regarding your farm or ranch operation?
  - Expand my operation's size or enterprise(s)
  - Maintain current levels of production
  - Stay in farming but work more hours off the farm
  - Leave farming and work and off-farm job
  - Retire from farming
  - Other, please specify:



## APPENDIX B: Farm Characteristics, Tabulated (n=48)

Category	# Respondents	% Respondents
Farm products		
Oilseed or grain crops	2	4
Cotton	1	2
Hay	6	13
Livestock (for sale)	17	35
Livestock (for meat)	18	38
Eggs	17	35
Dairy products	2	4
Vegetable crops (including melons)	26	54
Fruit crops (berries)	10	21
Fruit and/or nut crops (orchard)	15	31
Nursery or greenhouse production	10	21
Value-added products	16	33
Other	8	17
Acreage		
1-9	15	31
10-49	13	27
50-199	8	17
200-499	9	19
500-999	1	2
1,000 acres or more	2	4
Tenure		
Rent farmland	14	29
Sustainable practices		
Cover cropping	32	67
Crop rotation	28	58
No-till	14	29
Minimum or conservation tillage	20	42
Integrated pest management	27	56
Rotational grazing	23	48
Other	11	23
Information sources		
Trade journals	14	29
Farm magazines	24	50
Newspapers	3	6
Extension service	23	48
Organizations or associations	36	75
Radio	1	2
Television	3	6
Neighbors	5	10
Other farmers	39	81
Other	19	40
Marketing arrangements		
Production contracts	2	4
Marketing contracts	0	0
Farmers market	22	46
Farm stand	15	31

Category	# Respondents	% Respondents
CSA program	14	29
U-pick program	3	6
Online platform	15	31
Direct to restaurants	14	29
Cooperative	8	17
Wholesale	12	25
Other	11	23
<b>Sales</b>		
Less than \$1,000	7	15
\$1,000-\$2,499	2	4
\$2,500-\$4,999	8	17
\$5,000-\$9,999	2	4
\$10,000-\$24,999	9	19
\$25,000-\$49,999	8	17
\$50,000-\$99,999	9	19
\$100,000-\$199,999	3	6
\$200,000-\$349,999	0	0

*Note.* Percentages calculated based on n=48; totals may not equal to 100 due to rounding.