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## Factors Contributing to Success of Small Farm Operations in Tennessee

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## Factors Contributing to Success of Small Farm Operations in Tennessee

### Abstract

Small farms that are numerous and diverse have been facing various challenges. There are only few studies examining critical factors that would promote success in their operations. This article uses survey data from Tennessee to address this issue. Analysis of the data shows the importance of the following for success: 1) production strategies based on diversification and cost control; 2) financial plans that keep debt low and good record keeping; and 3) marketing strategy aimed at achieving the highest possible profit. The results are expected to be useful for farmers, Extension personnel, policy makers, and groups working with small farmers.

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## Introduction

Small farms, which are diverse, represent an important segment of the agricultural sector and rural communities (Rossett, 1999; Steele, 1997). These farms are numerous, contributing to agricultural output and controlling a substantial share of assets. According to the most recent Census of Agriculture, about 91% of the total farms in the U.S. fall in this category. The corresponding figure for Tennessee is 97% (USDA, 1997). Despite these facts, small farms have been facing a number of problems over the years that continue to challenge their viability (National Commission on Small Farms, 1998; National Small Farm Conferences, 1996, 1999, & 2002).

This article uses the definition of small farms suggested by the National Commission on Small Farms, i.e. farms with annual gross sales of under \$250,000. The typology developed by the USDA-ERS (Hoppe, Perry, & Banker, 2000) classifies small farms into the following categories:

- **Limited resource**--Operator household income under \$20,000; farm assets under \$150,000; and gross sales under \$100,000.
- **Retirement**--Operators reporting that they are retired from a farm or nonfarm occupation and gross sales under \$250,000.
- **Residential/Lifestyle**--Operators reporting nonfarm occupation as their principal occupation and gross sales under \$250,000.
- **Farming occupation/Lower sales**--Operator's principal occupation is farming and farm sales are under \$100,000
- **Farming occupation/Higher sales**--Operator's principal occupation is farming and farm sales are \$100,000- \$249,999.

The above typology is useful in distinguishing the different sub-groups of small farmers and captures their diversity. The key problem faced by small farmers is to increase their income by increasing profitability of their operations. Achievement of the latter requires identification and analysis of factors that contribute to success.

There are very few studies dealing with this issue both at the national and state levels. At the national level, Perry and Johnson (1999) conducted a study using data from the Agricultural Resource Management Survey (ARMS). The study focused on small farms (annual gross sales under \$250,000) where the primary occupation of the operator is farming. The study showed that top-performing farms used three management practices: production strategies that control costs, actively marketing their products, and adopting financial strategies such as maintaining cash and credit reserves. The study also suggests that experiences may provide strategies for success in small farm operations.

At the state level a study by McLean-Meyinsse and Brown (1994) showed that factors contributing to success are good management practices, knowledge and early adoption of new technology, a strong work ethic, love of farming, size of operation, participation in government programs, and strong family support. Important areas for change include improved education, emphasis on high-return enterprises (fruits and vegetables), restructuring of USDA programs (including the guarantee of acceptable returns for fruits and vegetables producers), expansion of off-farm employment opportunities, and improved access to credit.

Another study characterized successful small farmers as those maintaining economic viability through use of old equipment instead of new purchases; relying on contractors to carry out capital-intensive activities; producing specialty products; using diverse marketing outlets; seeking information to reduce production and marketing risks; and diversifying their income sources to include off-farm income (Jolly, 1993). The study also concluded that access to credit appears to be a major difficulty for many of these small farm operations.

In another study by Nanhou and Duffy, (2002), success was measured in terms of financial gains (profitability). The authors found a negative relationship between success and farmer's age and positive relationship for education, yield, machinery and labor efficiency, rented acres, and contribution to total revenue from livestock production. The study suggests that diversifying their operation between crop and livestock production will help to achieve success.

## **Objective**

The objective of the study described here was to identify and analyze factors that contribute to success of small farm operations in Tennessee.

## **Data and Methodology**

A detailed questionnaire was mailed to 200 randomly selected small farmers in 18 Middle and West Tennessee counties. Farmers were asked to classify themselves on a continuum to show the degree of success in their farm operations. A scale of 1 to 8 was used, where 1 = Not Successful and 8 = Very Successful. Farmers with responses between 1-5 were categorized as less successful and 6-8 as very successful. These corresponding categories of success level with each scale were determined before data were collected.

Respondents were also asked to rank various factors that affect their level of success using the Likert-scale 1 to 5. Factors included in the survey were size and type of farm operation, sources of information, importance of family labor and off-farm income, use of information technology, perception about different statements, marketing practices, and research, extension, and education needs.

Seventy-four usable responses, representing 37% response rate, were received with one round of mailing and follow up reminder telephone calls. The data collected is representative for farmers in most of the counties located in western and middle Tennessee.

## **Results and Discussion**

### **Demographic Characteristics and Success Level**

There were several demographic variables included in the survey, and results indicated that 35.5% of African-American farmers were less successful compared to only 7.7% who rated themselves as very successful (Table 1). On the other hand, the vast majority of very successful farmers (92.3%) were white. The race variable was also found to be statistically significant using a Chi-Square test ( $\chi^2 = 6.204, P = 0.013$ ).

The other variables included in the study were gender, age, education level, annual gross sale, type of business, and off-farm work activities. The relationship between the level of success and these variables were not found to be statistically significant using Chi-Square test. The relationship between these variables and success level is shown in Table 1.

The other characteristics of very successful farmers were full time farming with less off farm work,

business type of sole proprietorship and partnerships, and higher average age, compared to less successful farmers. But the above relationships were not found to be statistically significant.

**Table 1.**  
Some Characteristics of Small Farmers in Tennessee as Determined by a Survey

	<b>Less Successful</b>	<b>Very Successful</b>
	<b>Percent of Respondents</b>	
<b>Race<sup>a</sup></b>		
African-American	35.5	7.7
White	64.5	92.3
<b>Gender</b>		
Male	93.8	84.6
Female	6.2	15.4
<b>Age (years)</b>		
Up to 40	16.1	14.8
41-60	61.3	44.4
Over 60	22.6	40.7
Average	51.1	57.0
<b>Education</b>		
< High School	12.1	8.0
High School/GED	33.3	40.0
College	54.5	52.0
<b>Annual Gross Sale (\$)</b>		
< 10,000	10.7	8.7
10,000 - 20,000	50.0	26.1
21,000 - 40,000	17.9	39.1

41,000 - 60,000	10.7	13.0
61,000 - 80,000	3.6	8.7
81,000 - 100,000	3.6	0
101,000 - 250,000	3.6	4.3
<b>Type of Business</b>		
Sole Proprietorship	69.7	75.0
Family	18.2	10.7
Partnership	6.1	14.3
Others	6.0	0
<b>Farming as Principal Occupation</b>		
Yes	39.4	53.6
No	60.6	46.4
<b>Off-Farm Work</b>		
Yes	63.6	44.4
No	36.4	55.6
<b>Percent Household Income from Off-Farm Work</b>		
	65.7	59.2
aChi-Square Value 6.204, significant at (P = 0.013), others are not significant		

### Sources of Information

The top three sources of information for very successful farmers are other farmers, neighbors, and Extension Service, while Extension Service, other farmers, and farm magazines are the three main sources for less successful farmers (Table 2). Statistically significant differences were found in using radio and neighbors as sources of information between very successful and less successful farmers. The results indicated that very successful farmers depend more on their neighbors and radio than less successful farmers.

**Table 2.**  
Usefulness of Various Sources of Information  
(Where 1= not, and 5= very useful)

	Source of Information	Less Successful	Very Successful
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A	Trade journals	2.55	2.68
B	Farm magazines	3.41	3.58
C	Newspapers	2.70	3.04
D	Extension Service	3.67	3.90
E	Commodity organizations	2.39	2.43
F	Radio*	2.12	2.77
G	Television	2.39	2.68
H	Neighbors**	3.38	3.88
I	Data Transmission Network (DTN)	1.69	1.78
J	Other farmers	3.56	3.92
*Significant at the 90% level of confidence, comparing within a row values using t-test **Significant at the 95% level of confidence, comparing within a row values using t-test			

## Marketing Tools and Strategies

Direct marketing involving farmer markets and other outlets was the most used marketing channel by both groups of farmers (Table 3). The lowest values with seven other tools indicate that small farmers do not use these methods to market their products. Less successful farmers used farmer markets more, while very successful farmers used other types of direct marketing more often than less successful farmers. The difference was also found to be statistically significant. More successful farmers used niche marketing relatively more than less successful farmers.

Similarly, there was significant difference in using forward cash contracts even though it was one of the least used marketing systems by these two groups. The top three marketing strategies for very successful farmers were making profit, getting the highest price, and reducing risk, respectively, while the top strategy for less successful farmers was getting the highest price, followed by making profit and reducing risk.

**Table 3.**  
Marketing Tools Used by Small Farmers  
(Where 1= not used, and 5= very frequent used)

	Marketing Tools	Less Successful	Very Successful
A	Forward cash contracts**	1.13	1.60
B	Price later contracts	1.14	1.45
C	Minimum price contracts	1.18	1.45
D	Future markets	1.21	1.35

E	Options	1.32	1.35
F	Market advisors	1.43	1.76
G	Marketing cooperatives	1.50	1.67
H	Other Direct marketing*	2.46	3.29
I	Niche marketing	2.29	2.20
J	Farmer markets	2.54	1.91
*Significant at the 90% level of confidence, comparing within a row values using t-test **Significant at the 95% level of confidence, comparing within a row values using t-test			

### Input Use and Management Practices

Farmers were asked to indicate the use of various inputs and practices in their operation. The results showed that both groups of farmers used practices aimed at keeping their debt low. Record keeping and minimum use of hired labor were also key practices used by very successful farmers. There were significant differences between the two groups regarding the latter two issues. The other significant practice used by less successful farmers was soil testing. List of various inputs and practices used by both groups are shown in Table 4.

**Table 4.**  
Relationship Between Success Level and Some Important Factors  
(Where 1 = not used/important, and 5 = very frequently used/important)

Activities	Less Successful	Very Successful
<b>Input Use and Management Practices</b>		
Minimum use of hired labor**	3.15	3.85
Keep debt low	4.15	4.26
Record keeping**	3.41	4.08
Regular soil testing	3.52	3.76
<b>Factors Contributing to Success</b>		
Hard work	4.74	4.74
Attention to detail***	3.91	4.65
Timing**	4.03	4.63
Off-farm employment	3.91	3.28

Government policies*	2.69	3.39
<b>Use of Information Technology</b>		
Knowledge & training about use of information technology (IT)	2.87	2.77
Access to a computer with Internet	3.07	2.89
Concern about privacy when using IT*	2.43	3.12
E-mail use	2.39	2.35
Internet use	2.71	2.72
*Significant at the 90% level of confidence, comparing within a row values using t-test **Significant at the 95% level of confidence, comparing within a row values using t-test ***Significant at the 99% level of confidence, comparing within a row values using t-test		

### Contribution of Other Factors to Success

Both groups of farmers responded that "hard work," "timing," and "attention to detail" were key factors in their success. Less successful farmers indicated that off-farm employment is also important for successful farming. Very successful farmers responded that "timing" and "attention to detail" are more important factors in successful farming, compared to less successful farmers. Statistically significant difference was found between the two groups (Table 4). According to very successful farmers, "government policies" also affect success of their operation, compared to less successful farmers.

### Computer and Information Technology Utilization

Various questions regarding access to computer with Internet, knowledge and skill level, and concerns regarding this technology were also asked in the survey. Most of the responses regarding these issues fall between moderately used to less used categories (Table 4). Very successful farmers have more concerns about privacy when using information technology (IT) than their counterparts. Access to a computer and use of Internet and e-mail were relatively low for both groups of farmers, indicating a need for training and educational programs for small farmers.

### Research, Education, and Extension Needs

Several needs of very successful and less successful farmers in the area of research, education, and Extension are shown in Table 5. The most important need in research was marketing, followed by production and assessment of technology for both groups of farmers. Similarly, both groups also indicated the importance of participating in educational programs to improve their marketing skills. Both groups of farmers also emphasize the importance of Extension to provide one-on-one assistance, followed by more staff and improved information.

**Table 5.**  
Research, Education and Extension needs of small farmers  
(Where 1 = not important, and 5 = very important)

	<b>Areas</b>	<b>Less Successful</b>	<b>Very Successful</b>
A	<b>Research</b>		
	Marketing	4.41	4.39



	Production	4.39	4.27
	Assessment of technology	3.39	3.67
B	<b>Education</b>		
	Better outreach material	3.30	3.93
	Marketing skills	4.13	4.40
	Risk management	3.38	3.00
	Record keeping & Planning	3.43	3.21
C	<b>Extension</b>		
	One-on-one assistance	4.23	4.25
	Better trained staff	3.43	3.00
	More staff	3.50	3.77
	Improved information delivery system	3.20	3.64

## Future Plans

The majority of very successful farmers (68.2%) indicated that they would stay in farming and expand their operation, compared to only 46.7% of less successful farmers. On the other hand, 30% of the less successful farmers indicated that they will retire from farming. Such responses provide indications that there is need for programs and policies specially formulated for these farmers to increase their profitability and enable them to stay in business.

**Table 6.**  
Future Plans of Small Farmers (%)

	<b>Future Plans</b>	<b>Less Successful</b>	<b>Very Successful</b>
A	Stay in farming and expand their farming operations	46.7	68.2
B	Retire from farming and start non-farm business	13.3	4.5
C	Stay in farming and get more off-farm employment	10.0	9.1
D	Retire from farming	30.0	13.6
E	Other	0	4.5

## Conclusions

The study described here examined various factors that contribute to the success of small farmers. These factors ranged from production to management and marketing practices. Results show that more successful farmers use production systems that are diverse, adopt measures to control cost, and use marketing strategies that seek the highest level of profit. Farming were found to be the principal occupation of a large proportion of very successful farmers. The study also concluded that the level of success was not uniform among farmers of different race. Farmer markets and other direct market outlets were the most used marketing methods by both groups of farmers.

Factors identified in this study that contribute to success will help less successful small farmers in Tennessee to modify their production and management practices to become more successful. The operators of small farms in other states can also adopt similar strategies to be successful. The findings can also assist in formulating policies and strategies involving research, education, and Extension to enhance success of small farm operations.

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