CALAMANSI PRODUCTION PRACTICES AND EFFICIENCY IN BUENAVISTA, GUIMARAS

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ABSTRACT Calamansi or calamondin (Citrofortunella microcarpa) is one of the focus commodity of the Municipality of Buenavista, Guimaras. This had been a promising industry that had greatly improved the quality of life of the Buenavistahanons. However, with due to various constraints, this industry weakened for several years. The industry is still hoped to bring quality life to the calamansi farming community. Hence, this study was conducted municipal-wide to determine the latest status of the industry last November-December 2017. This aims to determine the profile and production practices of calamansi growers, economic efficiency of calamansi industry and the problems met and production constraints met by the calamansi growers. Majority of the respondents were already senior citizens with ages ranging from 60 years old and above. They were mostly male, married and generally have 2 children. Most of them were high school graduates. Their top three occupations noted were farmer, housewife, and laborer. The largest numbers of calamansi farms were located at Barangay San Nicolas. The largest numbers of respondents were into calamansi farming operations for 6 to 15 years but most of the respondents were not affiliated to any organization and were not able to attend any training or seminar. Almost all respondents sourced-out planting materials within the province. All respondents manually prepared their lands, propagate the calamansi plants through marcotting and planted seedlings on a manual basis. Fertilizer application is generally transitional, where farmers apply combinations of organic and commercial synthetic fertilizers. Majority of the respondents practiced conventional method in controlling or preventing pests and diseases. They generally raised calamansi under rainfed condition but some irrigate the farm with water sources from deep wells, streams or rivers. They generally harvested calamansi fruits on monthly basis or twice a month. Nearly all of the respondents practiced composting to manage residues in the farm. As to farm products, the majority of the respondents produce also rice, coconut, and banana. Other respondents also produce mango, papaya, and other native fruits. Majority of the respondents operated calamansi farms of less than 1 ha that were generally owned by the respondents. A hectare of calamansi yielded generally yielded 101 to 500 kgs of calamansi fruits per hectare. The farm gate price of calamansi fruits during the study was generally PhP 16-25. Majority of the respondents noted that they spent PhP 1001 to PhP 5000 per hectare and they generally employed one (1) worker on the farm. Majority of the respondents depended on wholesaling when selling their products they also noted that marketed products were generally paid in cash. The respondents noted drought, propagation constraints, pest and disease management, stray grazing livestock and the significantly low farm gate price during peak season as the most important problems and production constraints in calamansi production.

Keywords: citrus production, farming practices

INTRODUCTION

Background of the Study

Calamansi or calamondin (Citrfortunella microcarpa) is a fruit tree native to the Philippines. It is the most commonly grown backyard tree among the citrus species. It can thrive in a wide variety of environmental conditions. It is a small tree with a height ranging from 2 meters to 7 ½ meters at maturity. Its broad egg-shaped leaves are dark green in the upper surface and pale green underneath. The fruit is round about 2 cm to 40.5 cm in diameter and greenish - yellow in color.

Like its relatives, such as the mandarin, pomelo and sweet orange, the calamansi is rich in phosphorous, calcium, iron and Vitamin C or ascorbic acid. It is the most popular and most commonly used citrus fruit in the country. Its juice is nutritious and traditionally made into a fruit drink that helps prevent respiratory diseases. It also helps strengthen the bones and stimulate growth, especially among growing children. It can be used as a flavoring ingredient in desserts, e.g. leche flan, or as an additive in various food preparations, such as fish steak.

Its pulp is used as a major ingredient in beverages, syrups, concentrates, and purees. The peel is made into jams, candies, and marmalade. With its alkalinizing effect, on the body calamansi helps circulate blood evenly and facilitates normal digestion.

Filipinos can have a year-round supply of this versatile citrus fruits by growing the plant right in their front yards or backyards or even in big boxes (Department of Agriculture, 2016)

Statement of the Problem

This research understanding sought to investigate the production and marketing practices of calamansi growers and farms in Guimaras Province. Specifically, this study aimed to answer the following questions: (1) what is the profile of the respondents when categorized to; age, civil status, occupation, educational attainment, family monthly income, number of children, Farm location, Numbers of years in operation, organizational affiliation, and seminars and training attended; (2) what are the production practices of the calamansi growers when categorized to: sources of planting materials, land preparation, plant propagation, planting, fertilization, pest and disease management, watering management, harvesting period, farm waste management, and farm products; (3) what is the economic characteristic of calamansi growers/farms when categorized to: farm size, land ownership, yield per hectare, gate price, variable cost, fixed cost, capitalization, number of workers, and marketing schemes; (4) what are the problems met and production constraints when categorized to: environmental factors, technical factors, social factors, and economic factors.

METHODOLOGY

A descriptive research design was used to gather information of the study. The respondents of the study were the 190 calamansi grower in Guimaras. The survey and farm visits was conducted in all calamansi farms in the province of Guimaras that covered the five municipalities: Buenavista, Jordan, San Lorenzo, Nueva Valencia, and Sibunag respectively. According to Librero (1996), a survey research design allows to study "naturally occurring phenomena." Furthermore, a researcher collects data from a part of the population to assess the interrelationship of the variables in his/her study. Survey research is the most efficient method of gathering data that was used to describe a very large population (Babbie, 1986). For this study, survey was done from enumerated respondents using key informant. The respondents represented by the farmers and farm owners served as participants in whom they have a direct engagement in calamansi production in Guimaras. The preliminary interview was facilitated to gather data from the calamansi growers agricultural instructors/professors, and researchers concerning the production and marketing of calamansi. Statistical tools used were frequency, percentage distribution, mean, and financial risk analysis.

RESULTS AND DISCUSSION

Profile of Respondents. A total of 190 calamansi growers were interviewed for this study and their profiles were classified according to age, civil status, occupation, educational attainment, family monthly income, number of children, farm location, number of years in operation, organizational affiliation, and seminars and trainings attended. Table 1 shows the personal profile of the respondents in terms of age, gender, civil status, occupation, educational attainment, family monthly income, and number of children. Results show that the majority of the respondents were already senior citizens with ages ranging 60 and above (59 or 31.1%). It was followed by those aging from 41 to 50 years old with 49 or 25.8% responses, 51 to 60 years with 41 or 21.6% responses, 31 to 40 years old with 35 or 18.4%. The least number of responses was taken from those aging 30 and below (6 or 3.2%). The respondents were 76% (144) male and 24% (46) female. This only reflects that females also play an important role in calamansi industry. In terms of civil status, it was noted that majority of the respondents were already married (154 or 81.1%), 18 or 90.5% each were and widowed, 16 or 8.4% were single and only 1 or 0.05% was on live-in status and was separated.

Table 1. Profile of the Respondents

Items	Frequency	Percent
Age:	6	3.2
30 & below	35	18.4
31-40	49	25.8
41-50	41	21.6
51-60	59	31.1
more than 60	190	100.0
Total		
Gender:	144	76.0
Male	46	24.0
Female	190	100.0
Total		

Civil Status:		
Live-in	1	00.5
Married	154	81.1
Separated	1	00.5
Single	16	8.4
Widowed	18	90.5
Total	190	100.0
Occupation:		
Brgy. Officials		
Businessman/woman	6	3.16
Farmer	12	6.32
Housewife	107	56.32
Laborer	28	14.74
Government Employee	24	12.63
Retired	5	2.63
None	4	2.10
Total	4	2.10
	190	100.0

In terms of occupation, it was noted that the top three occupation of the respondents were farmer, housewife, and laborer, where farmers being the majority had 99 or 52.1% responses followed by housewives with 28 or 14.8% responses and laborers with 12 or 6.3%. Regarding educational attainment, most of the respondents were high school graduates with 69 or 36.3% responses, followed by elementary graduates with 56 or 29.5% responses, then college graduates with 39 or 20.5% responses. The least number of respondents reached a vocational level with 1 or 0.5% responses.

As to the number of children, the respondents generally has 2 children with 50 or 26.3% responses, 31 or 16.3% have 3 children, and 26 or 13.7% have no children. The least number of respondent have 11 children with 1 or 0.5% response.

Table 2. Profile of the respondents as to educational attainment, family monthly income, and number of children

Items	f	%
Educational attainment:		
College Graduate	39	20.5
College Level	7	3.7
Vocational Graduate	5	2.6
Vocational level	1	0.5
HS Graduate	69	36.3
HS Level	9	4.7
Elem. Graduate	56	29.5
Elem. Level	4	2.1
Total	190	100.0
Family monthly income:		
5000 & below	136	71.6
5001-10000	26	13.7
10001-20000	15	7.9
more than 20000	13	6.8
Total	190	100.0
Number of children:		
0-3	123	64.74
4-7	59	31.05
8-11	8	4.21
Total	190	100.0

In terms of farm location, the largest number of calamansi farms were located at Barangay San Nicolas with 42 or 22.1% responses, this was followed by Barangay Pina with 28 or 14.7% responses, and Barangay San Fernando and Tinadtaran with 23 or 12.1% responses each. The least number of farms were noted in Barangays Supang and San Isidro with 1 or 0.5% response for each of them. San Nicolas had long been known as the largest producers of calamansi in Buenavista and in Guimaras as a whole.

When it comes to the number of years in operation, the largest number of respondents were into calamansi farming operations for 6 to 15 years already with 78 or 41.1% responses, 46 or 24.2% were into operation for 1 to 5 years only, and 33 or 17.4% were into operation for 16 to 25 years and more than 5 years for each period. The results implied that most of the calamansi growers in Buenavista are quite new to the industry.

As to organizational affiliation, the respondents generally were not affiliated to any organization with 128 or 67.4% responses. However, those respondents who were already 60 years and above were members of the Senior Citizens Association with 25 or 13.1% responses. The rest of the respondents were very thinly distributed to other organizations they have identified.

In terms of seminars or trainings, the majority of the respondents were not able to attend any training or seminar with 121 or 63.7% responses. Others with 45 or 23.7% responses have attended trainings or seminars but were not related to calamansi. On the other hand, 21 or 11% of the respondents were able to attend trainings or seminars related to calamansi production or processing. Hence, trainings are necessary to capacitate these respondents.

Table 3. Profile of respondents when categorized as to farm location, years in prison, organizational affiliation, seminars and trainings attended

Items	f	%
Farm Location:		
Agsanayan	6	3.2
Avila	8	4.2
Banban	7	3.7
Cansilayan	14	7.4
East Valencia	2	1.1
Nazaret	17	8.9
Pina	28	14.7
San Fernando	23	12.1
San Isidro	1	0.5
San Nicolas	42	22.1
Supang	1	0.5
Tanag	6	3.2
Tastasan	10	5.3
Tinadtaran	23	12.1
Umilig	2	1.1
Total	190	100.0
Years in operation:		
1-5 yrs	46	24.2
6-15 yrs	78	41.1
16-25 yrs	33	17.4
more than 25 yrs	33	17.4
Total	190	100.0
Organizational Affiliation:		
4Ps, IWAG	2	0.5
ASFA	1	0.5
Banana Planters Association, Senior Citizen's Assoc.	1	0.5
BOGA	1	0.5
Brgy. Officials	1	0.5
Calamansi Growers Association	6	3.1
chairman at kilusang pagbabago and multi-sectoral advisory council	1	0.5
Coco Feed	1	0.5
Rice cluster association	8	4.2
Hugpong Federal	1	0.5
IWAG	1	0.5
None	128	67.4

PCA member	2	1.0
RONAT	1	0.5
Senior Citizen's Assoc.	25	13.1
SEPDIC	1	0.5
Sewing	1	0.5
TABA Association	2	1.1
TPAS ARC COOP	5	2.6
Ugyon	1	0.5
Total	190	100.0
Seminars or trainings attended:		
Artificial Insemination	1	0.5
Calamansi& vegetable training	1	0.5
Calamansi related	21	11.0
Meat processing and food	1	0.5
preservation	121	63.7
None	45	23.7
Not related	190	100.0
Total		

Production Practices

The production practices of calamansi were determined by knowing the source of planting materials, land preparation practices, plant propagation, planting, fertilizer application, pest and disease management, water management, harvest period, farm waste management and other farm products.

As reflected in Table 4, it was noted that almost 100% of the respondents (189) sourced out their calamansi planting materials within the province. Their lands were 100% manually prepared with the aid of carabao-drawn plow. The plant was also 100% propagated through marcotting and planted on a manual basis. Fertilizer application is generally transitional, where farmers apply combinations of organic and commercial fertilizers, with 98 or 51.6% responses. It was closely followed by conventional fertilizer application with 86 or 45.3% responses. On the other hand, very few of the respondents (6 or 3.1%) practiced organic fertilizer management. The result implied that calamansi growers are not much dependent on synthetic fertilizers alone.

In terms of pest and disease management, the majority of the respondents (150 or 78.9%) practiced conventional method with the use of synthetically formulated pesticides. Very few practiced organic methods with 18 or 9.5% responses, 13 or 6.8% never applied any method of control and the least of the respondents (9 or 4.7%) practiced transitional or combinations of conventional and organic methods in controlling or preventing pests and diseases. The result implied that in terms of pest and disease management, the calamansi growers still rely on synthetic pesticides to prevent or control pest infestations.

As to water management, respondents generally raised calamansi under the rainfed condition with 155 or 81.6% responses. Others (35 or 18.4%) raised calamansi with irrigation coming from deep wells and streams/rivers with the aid of water pumps.

When harvesting, respondents generally harvested calamansi fruits on monthly basis or twice a month with 68 or 35.8% responses for each period. It was followed by a weekly basis with 29 or 15.3% responses and twice a week with 16 or 8.4% responses. When calamansi fruits are well taken cared through appropriate fertilizer application, these will really augment the income of the growers as it can be harvested several times in a year.

In terms of farm waste management, nearly all of the respondents practiced composting to manage residues in the farm with 178 or 93.7% responses. Only very few practiced dumping (6 or 3.2%), burning, combinations of burning and dumping, and those that never manage their residues with 2 or 1.1% responses for each. This implies that growers valued the benefits of composting in calamansi production. As to farm products, the majority of the respondents produce also rice, coconut, and banana. Other respondents also produce mango, papaya, and other native fruits.

Table 4. Production Practices of Calamansi

Items	f	%
Source of planting materials:		
Outside the province	1	0.5
W/in the province	189	99.5
Total	190	100.0
Land preparation:		
Mechanical	0	0.0
Manual	190	100.00
Total	190	100.0

Plant propagation:		
Seeds	0	0.0
Marcotted	190	100.0
Total	190	100.0
Planting:		
Manual	189	99.5
Mechanical	1	0.5
Total	190	100.0
Fertilizer application:		
Conventional	86	45.3
Conventional, transitional	1	0.5
Organic	6	3.1
Organic, Conventional	3	1.6
Transitional	94	49.5
Total	190	100.0
Pest and Disease management:		
Conventional	150	78.9
None	13	6.8
Organic	18	9.5
Transitional	9	4.7
Total	190	100.0
Water management:		
Irrigated	35	18.4
Rain fed	155	81.6
Total	190	100.0
Harvest period:		
1 harvest	1	.5
monthly	68	35.8
thrice/year	1	.5
twice a month	68	35.8
twice a week	16	8.4
twice a year	7	3.7
weekly	29	15.3
Total	190	100.0
Farm waste management:		
Burning	2	1.1
Burning, dumping	2	1.1
Composting	178	93.7
Dumping	6	3.2
None	2	1.1
Total	190	100.0

Economic Characteristics

The economic characteristics of calamansi production were determined on the bases of farm size, land ownership, yield, gate price, production cost, capitalization, number of workers, and marketing and payment schemes (Table 5).

The results showed that majority of the respondents have a farm size of less than 1 ha with 158 or 83.2% responses. It was followed by 29 or 15.3% of the respondents having 1 to 2 hectares of calamansi farm. Very of the respondents have 2.1 to 3 hectares (2 or 1.1%) and 3.1 to 4 hectares (1 or 0.5%). These farms are generally owned by the respondents (160 or 84.2%) and some were tenants with 27 or 14.2% responses. Very few of the respondents' farms were either rented or owned by the cooperative.

In terms of yield, a hectare of calamansi yielded 101 to 500 kgs of calamansi fruits per hectare with 92 or 48.4% responses. It was followed by 501 to 1000 kgs with 62 or 32.6% responses, 1001 to 5000 kgs with 18 or 9.5% responses and 100 kgs and below with 15 or 7.9% responses. Very few responded (3 or 1.6%) to have yields of more than 5000 kgs. The result implied that the optimum yield of calamansi was not reached as the plants were not well taken care of as according to calamansi growers they have weakening interest to further engage in the industry as the gate price of calamansi does not warrant a good profit. It can also be attributed to the age of the trees as the majority of the calamansi growers had been in operation for only 6-15 years.

The farm gate price of calamansi fruits during the study was generally PhP 16-25 with 119 or 62.6% responses. It was followed by PhP 7-15 with 59 or 31.1% responses. Only very few noted for PhP 26-35 as farm gate price with 12 or 6.3% responses. This only reflects that the farm gate price of calamansi is not stable.

Looking at the production cost, the majority of the respondents (109 or 57.4%) noted that they spent PhP 1001

to PhP 5000 per hectare. Thirty or 15.8% of the respondents spent PhP 50001 to PhP10000, 28 or 14.7% spent more than PhP 10000 and only 23 or 12.1% spent below PhP 1000. Nearly of the respondents (180 or 94.7%) used their personal savings to capitalize their farm operations. It distantly followed by financing and loaned with 5 or 2.6% responses for each. Looking at the production cost, it can be noticed that most of the respondents do not spend enough money for a hectare of calamansi farm as supported by their weakening interest to the industry.

As to the number of workers, 70 or 36.8% of the respondents employed one (1) worker in the farm. It was closely followed by two (2) workers with 48 or 25.3% responses, zero (0) employment with 33 or 17.4%. The least number of respondents employed seven (7) workers (1 or 0.5%). In terms of marketing, the majority of the respondents depended on wholesaling when selling their produce. Majority of the respondents also noted marketed produce were generally paid in cash (137 or 72.1%), while others noted that they were being paid 1-15 days after disposing their products to the market.

Table 5. Economic Characteristics of Calamansi Production

Items	f	%
Farm size:		
Less than 1ha	158	83.2
1-2.0 ha	29	15.3
2.1-3.0 ha	2	1.1
3.1-4.0 ha	1	0.5
Total	190	100.0
Land ownership:		
Coop	1	.5
Owned	160	84.2
Rented	2	1.1
Tenant	27	14.2
Total	190	100.0
Yield/ha:		
100kg & below	15	7.9
101-500kg	92	48.4
501-1000kg	62	32.6
1001-5000kg	18	9.5
more than 5000kg	3	1.6
Total	190	100.0
Gate price:		
7-15 Php	59	31.1
16-25 Php	119	62.6
26-35 Php	12	6.3
Total	190	100.0
Production cost per hectare:		
1000 Php & below	23	12.1
1001-5000 Php	109	57.4
5001-10000 Php	30	15.8
More than 10000 Php	28	14.7
Total	190	100.0
Capitalization:		
Financing	5	2.6
Loaned	5	2.6
Personal savings	180	94.7
Total	190	100.0
Number of workers:		
0	33	17.4
1	70	36.8
2	48	25.3
3	23	12.1
4	8	4.2
5	3	1.6
7	1	.5
No response	4	2.1
Total	190	100.0

Marketing scheme:		
Retail	5	2.6
Wholesale	175	92.1
Wholesale, retail	10	5.3
Total	190	100.0
Payment scheme:		
1-15days	51	26.8
Cash	137	72.1
Consignment	2	1.1
Total	190	100.0

Problems Met and Production Constraints

In terms of problems and production constraints encountered in calamansi production, nearly all respondents noted that drought is the most crucial environmental factor affecting the yield of calamansi as they have observed that the fruits were much smaller during these periods. Others also cited heavy rainfall or typhoons as these damaged fruit formation particularly when the plant is at its flowering stage and these also resulted to premature fruit fall.

As to technical factors, the respondents cited propagation constraints and pest and disease management as the two important factors affecting calamansi production. Respondents stated that most of their newly planted marcots failed to survive in the field. Others also noted that they have problems on citrus cankers as it affects the quality of their produce.

Generally, calamansi farms are not fenced. Hence, most of the problems cited by the respondents are stray grazing livestock particularly goats. Some also cited cases of theft but they said they did not significantly reduce yield. In terms of economic factors, nearly all respondents cited that calamansi fruits have very low farm gate price during peak season. This factor greatly affected the calamansi growers income and this had prompted other growers to lessen their interest on the industry or even stop their production operations.

CONCLUSIONS

Majority of the respondents were already senior citizens with ages ranging from 60 years old and above. They were mostly male, married and generally have 2 children. Most of them were high school graduates. Their top three occupations noted were farmers, housewive and laborers. The largest number of calamansi farms were located at Barangay San Nicolas. The largest number of respondents were into calamansi farming operations for 6 to 15 years but most of the respondents were not affiliated to any organization and were not able to attend any training or seminar. Almost all respondents sourced-out planting materials within the province. All respondents manually prepared their lands, propagate the calamansi plants through marcotting and planted seedlings on a manual basis. Fertilizer application is generally transitional, where farmers apply combinations of organic and commercial synthetic fertilizers. Majority of the respondents practiced conventional method in controlling or preventing pests and diseases. They generally raised calamansi under rainfed condition but some irrigate the farm with water sources from deep wells, streams or rivers. They generally harvested calamansi fruits on monthly basis or twice a month. Nearly all of the respondents practiced composting to manage residues in the farm. Majority of the respondents operated calamansi farms of less than 1 ha that were generally owned by the respondents. A hectare of calamansi yielded generally yielded 101 to 500 kgs of calamansi fruits per hectare. The farm gate price of calamansi fruits during the study was generally PhP 16-25. Majority of the respondents noted that they spent PhP 1001 to PhP 5000 per hectare and they generally employed one (1) worker on the farm. Majority of the respondents depended on wholesaling when selling their products they also noted that marketed products were generally paid in cash. The respondents noted drought, propagation constraints, pest and disease management, stray grazing livestock and the significantly low farm gate price during peak season as the most important problems and production constraints in calamansi production

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