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Status of Wild Grape Cultivation and Distribution in Korea Focused on Paju City in Gyeonggi Province and Muju County North Jeolla Province

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Wild grapes are grown throughout Korea as a short-term income crop of forest products, and a part of measure to deal with the Uruguay Round. Local governments are providing farm assistance and helping growers to construct facilities needed to grow wild grapes. However, this fruit is produced excessively, and not sold readily due to the difficulty in finding appropriate distribution channels in recent years. In this study, the level of wild grape production in Paju City in Gyeonggi Province and Muju County in North Jeolla Province, and distribution channels were examined to seek ways for the growers to gain more profits. The results showed that the growers need 1) systematic growing techniques to produce premium grade wild grapes, 2) the expansion of cooling facilities to store their product long enough for distribution without damaging the product, 3) support from the local government to recover from natural disasters and to assist processing facilities, and 4) on-going sales and promotion activities through various media, such as the Internet. Nonetheless, more efforts are needed such as discovering other income crops along with support for these growers, such as securing distribution channels for stable sales.

INTRODUCTION

It was about 15 to 20 years ago when Korean farmers started to grow wild grapes depending on different regions. Wild grapes were processed into different products such as wine in the mid 1990's. The so-called wild grapes grown in Korea are a cross breed between grapes and wild grapes (*Vitis Fexuosa*) (Korea forest Service, 1993) in which slip cuttings were obtained from the resulting seedling and grown into wild grape trees. They are grown throughout Korea including Paju City in Gyeonggi Province, Pyungchang County and Goseong County in Gangwon Province, and Muju County and Imsil County in North Jeolla Province. Compared with the year 2000, the level and value of production were increased by three-folds in the year 2004 at 993,704 kg and 3.2 billion won, respectively. The level of production was the highest in North Jeolla Province, followed by Kunggi, Gangwon, and North Kyungsang Provinces (Table 1). As a forest product, wild grapes offer a good prospect as a short-term income generating crop for farmers who need to compete with other farmers in the world with the Uruguay Round. Especially, they are not labor intensive (Kim and Kim, 1995), providing an advantage in Korea where labor cost is expensive, so that local governments have extended support to the growers of this crop. However, the level of production is excessive, resulting in price drop. Moreover, they are

not sold readily due to lack of recognition by Korean consumers, and processed goods, such as wild grape wine are competing with imported wine but not faring well. Despite all these difficulties, there has not been a quantitative study on wild grape growers in Korea. Therefore, this study was conducted to obtain actual statistics from wild grape growers in Korea in order to identify problems with wild grape growth, and point out the direction of better future for these farmers.

METHODS

The study was done by surveying large wild farms in which 23 wild grape farms in Juksong Myun, Paju city in Gyeonggi Province, and 22 farms in Juksang Myun, Muju County in North Jeolla Province. The survey was done through interviewing the growers for 1 month from early March to early April, 2006. The items related with production such as labor force, employment status, income, land used for wild grape growth, and crops grown were investigated. The size of wild grape farms, their production levels, and distribution status were also investigated. The results obtained were categorized into different regions, years, levels of wild grape production, and sizes of farm and analyzed by a category.

RESULTS AND DISCUSSION

General Situation of Wild Grape Cultivation and Production Levels in the Investigated Regions

Paju City in Gyeonggi Province

In Paju City in Gyeonggi Province, there were 80 farms growing wild grapes in a total land size of 65 ha at a total production level of 600 tons, giving a total of 1.3 billion won with each farm income of 16 million won in

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2005. In 2006, 160 farms grow wild grapes in a total land size of 240 ha at a total production level of 2,200 tons, giving a total of 1.3 billion won with each farm income of 28 million won. Thus, the size of wild grape growth and per farm income were increased by about four folds and two folds, respectively, compared with the year 2005. In 2005, 1.34 billion won was invested to build underground aging room space and storage facilities. In 2006, a 630 million won budget is set aside to build facilities to produce and process wild grape wine. Profits made were 490 million won between 1999–2006 by exporting 127,350 kg of wild grape juice and wine to Japan, Singapore, Hong Kong and the United States, and 2.02 billion won in 3 years between 2003–2005 (Paju City, 2006).

Muju County in North Jeolla Province

In Muju Kun in North Jeolla Province, 178 farms grew wild grapes in 80 ha land, producing a total of 800 tons in 2005. For 3 years between 2001 and 2003, a total investment of 440 million won was made with the farmers paying 40% of this investment. Four wineries are located in this area, and produce 327 tons of wine and sold 300 tons yearly. However, one winery has a stock of 280,000 bottles of wine, but sold only 10,000 bottles so far and expressed difficulties exporting wild grape wine.

Statistics Related with Wild Grape Farms

Production Structure

Labor Force Composition

Among 45 farms investigated, a total of 104 workers were present, who were older than 20 years of age, resulting in 2.3 workers per farm. In Paju city in Gyeonggi Province, the average number and age of workers were 2.3 persons and 64 years, respectively. In Muju County in North Jeolla Province, they were 2.3 and 62, respectively (Table 2).

Excluding Those Under 20 Years of Age

The most prevalent age of labor force was the 60's at 34%, followed by over 70 years of age at 29% and the 50's at 16%. In Paju City, it was the 60's and older than 70 years of age at 37% and 24%, composing 61% of the total work force. In Muju County, over 70 years of age and the 60's were 34% and 30%, respectively, composing 64% of the total work force. Thus, the work force was older than that in Paju City. On the other hand, the employment status in Paju City showed that among 54 people surveyed, 4 persons were regular forest workers, whereas 4 were temporary workers. In Muju County, 1 was regular forestry worker, 1 was self-employed, and 3 were temporary workers among 50 people. This low employment status is probably due to difficulty finding jobs in older people and family-oriented farming structure (Table 2).

Table 1. Yearly and regional wild grape growth in Korea

Classification		Amount (kg)	Value (mil won)
Year	2000	289,789	1,217
	2001	305,742	1,316
	2002	577,691	2,018
	2003	653,410	2,484
	2004	993,704	3,229
Province	North Jeolla	437,385(44.0)	1,356
	Gyeonggi	314,341(31.6)	729
	Gangwon	114,058(11.5)	660
	North Kyungsang	61,325(6.2)	215
	South Kyungsang	33,057(3.3)	101
	North Chungchung	31,700(3.2)	159
	Other	1,838(0.2)	9

Note: The number in parenthesis is the % ratio

Data: Korea Forestry Service. 2005. Annual statistics of forestry. 35: 298

Table 2. Status of labor composition

Households (H)	Total			20's	30's	40's	50's	60's	Over 70 years
	Total	Males	Females						
Total (45 H)	104	51	53	1 (1.0)	8 (7.7)	13 (12.5)	17 (16.3)	35 (33.7)	30 (28.8)
Paju City (23 H)	54	27	27	–	6 (11.1)	3 (5.6)	12 (22.2)	20 (37.0)	13 (24.1)
Muju County (22 H)	50	24	26	1 (2.0)	2 (4.0)	10 (20.0)	5 (10.0)	15 (30.0)	17 (34.0)

Note: 1) The number in parenthesis is the ratio (%)

2) Excluding those under 20 years of age

Status of Land Cultivated

Among 45 farms investigated in Muju County, 2 farms did not have land and 43 farms owned 58.4 ha. The average land per farm in Paju City was 1.6 ha and in Muju County was 1.0 ha, showing a difference, which is due to 1 farm in Paju City cultivating 10 ha of land. The number of farms that owned their forestry was small in which it was 2 in Paju City (0.7 ha and 18.0 ha) and 1 in Muju County (0.7 ha) (Table 3).

Status of Crops Cultivated

Among 45 households investigated, 43 owned land in which among the crops cultivated, rice was the predominant crop in both regions. But in Paju City, ginseng and zucchini were the crops planted the most following rice, whereas in Muju County, they were kadsura and red pepper (Table 4).

Status of Land Purchase and Sales

The status of land purchase showed that the area of rice paddies, fields and orchards sold in Paju City between 1970 to 2000 was 8.2 ha and bought was 24.1 ha, showing a 3 fold difference between the land sold and bought. Although there was more land bought between 1970 to 1990, more land was sold between 1990 and 2000. The main purpose of buying land was to secure livelihood by expanding farming land, whereas the main purpose of selling land was to pay off debts and finance children's education.

In Muju County, the land bought and sold between 1970 and 2000 were 7.7 ha and 1.5 ha, respectively, in which the land bought was five fold more than that of land sold. The reasons for buying and selling were the same as in Paju city (Table 5). Thus, those wild grape

farmers in Paju city and Muju County surveyed are seeking to expand their reproduction by securing livelihood by more land for farming (Kang *et al.*, 2005).

Status of Household Income

In 2005, the average household income in Paju City and Muju County was 31 and 18 million won, respectively, in which Muju County's income was less than 60% of Paju City. In 2004, the average income was 29 million won in each farm household but was 37 million won in each urban household (Ministry of Agriculture and Forestry, 2005). Among 23 households in Paju City, the total income was composed of 76% from agriculture and 15% from wild grapes. Those earning higher incomes were those in the 40's and 30's, those cultivating 1.0–1.5 ha of wild grape farms, and those cultivating more than 2.0 ha of agricultural land. Different from Paju City, the majority of income came from wild grape at 49% in Muju County, followed by agriculture at 34%. Those earning higher incomes were those in their 30's, those cultivating 1.0–1.5 ha of wild grape farms, and those cultivating 1.0–1.5 ha of agricultural land (Table 6). On the other hand, in Paju City where more wild grapes are grown than in Muju County, wild grapes were less responsible for overall farm income because 18 households out of 23 households suffered from hailstone damage around the harvest time in 2005. The damage suffered was 6–70% of total income of the previous year. Three households did not harvest any wild grapes. However, only 6 households out of 22 households suffered slightly from hailstone damage in Muju County.

Future Plan on Agriculture and Forestry

On the other hand, the livelihood of those 23 house-

Table 3. Status of land cultivated

Region	Total	Avg. per household	No land	Unit: ha				
				Less than 0.5ha	0.5 – 1.0ha	1.0 – 1.5ha	1.5 – 2.0ha	More than 2.0ha
Total	58.4 (45)	1.3	(2)	2.1 (8)	6.6 (10)	15.2 (12)	4.8 (3)	31.6 (10)
Paju City	36.8 (23)	1.6	–	1.6 (6)	2.3 (3)	6.4 (5)	1.5 (1)	26.9 (8)
Muju County	21.5 (22)	1.0	(2)	0.5 (2)	4.4 (7)	8.7 (7)	3.3 (2)	4.7 (2)

Note: The number in parenthesis is the number of households

Table 4. Status of crops cultivated

Region	Total	Unit: ha									
		Rice	Gingseng	Zucchini	Vege.	Grain	Red pepper	Kadsura	Potato	Mushroom	Other
Total	60.3 (100.0)	22.4 (37.1)	9.3 (15.4)	6.6 (10.9)	5.2 (8.6)	3.6 (5.9)	3.5 (5.8)	3.0 (5.0)	2.2 (3.6)	2.1 (3.5)	2.4 (2.9)
Paju City	38.8 (100.0)	13.0 (33.4)	7.7 (19.8)	6.6 (17.0)	5.2 (13.4)	1.7 (4.3)	0.8 (2.1)	–	–	2.1 (5.4)	1.8 (4.6)
Muju County	21.5 (100.0)	9.4 (43.7)	1.6 (7.6)	–	–	1.9 (8.8)	2.7 (12.6)	3.0 (14.1)	2.2 (10.1)	–	0.7 (3.1)

Note: The number in parenthesis is the ratio

holds in Paju city was kept on by raising wild grapes in 7 households, grains and vegetables in 6, and gingseng in 5. On the other hand in 22 households in Muju County, it was kept on by raising wild grapes in 14 households and grains and vegetables in 4. When asked whether

they would expand the land for farming and forestry, 17 households answered to maintain the current size, 4 to expand, and 2 no response. The main reasons for expansion were further cultivation of crops, such as ginseng and securing livelihood. The main reasons for

Table 5. Status of land purchase and sales

Classification		Bought					Sold			Unit: ha
		Total	Rice paddies	Fields	Orchards	Forestry	Total	Rice paddies	Fields	
Paju City	Total	33.9	17.3	15.8	0.8	18.7	6.7	3.7	3.0	
	Inheritance	9.8	4.1	4.9	0.8	18.7	–	–	–	
	1970's	13.0	6.0	7.0	–	–	–	–	–	
	1980's	2.6	0.3	2.3	–	–	1.3	1.0	0.3	
	1990's	7.9	6.6	1.3	–	–	2.9	2.0	0.9	
	2000's	0.6	0.3	0.3	–	–	2.5	0.7	1.8	
Muju County	Total	24.2	7.0	17.2	–	0.7	1.5	1.2	0.3	
	Inheritance	16.5	3.6	12.9	–	0.7	–	–	–	
	1970's	1.0	0.5	0.5	–	–	0.1	0.1	–	
	1980's	3.2	1.4	1.8	–	–	–	–	–	
	1990's	2.6	0.6	2.0	–	–	0.2	0.2	–	
	2000's	0.9	0.9	–	–	–	1.2	0.9	0.3	

Table 6. Status of household income

Classification		Total	Household avg.	Wild grapes	Agriculture	Fruits	Regular forestry work	Temporary forestry work	Lives-tock	Others	Unit: million won
Paju City	Total (23)	717.6	31.2	106.1 (14.8)	546.1 (76.1)	10.5	20.0	5.9	–	29.0	
	30's	115.0	57.5	14.0 (12.2)	95.0 (82.6)	–	–	–	–	6.0	
	40's	228.0	114.0	38.0 (16.7)	190.0 (83.3)	–	–	–	–	–	
	50's	171.6	34.3	9.1 (5.3)	140.4 (81.8)	–	–	2.1	–	20.0	
	60's	158.0	22.6	23.2 (14.7)	109.5 (69.3)	1.5	20.0	3.8	–	–	
	Over 70	45.0	6.4	21.8 (48.4)	11.2 (24.9)	9.0	–	–	–	3.0	
	Wild grapes	Less than 0.5 ha	177.1	22.1	9.1 (5.1)	148.4 (83.8)	2.0	10.0	5.6	–	2.0
		0.5–1.0 ha	166.2	18.5	27.7 (16.7)	98.7 (59.4)	8.5	10.0	0.3	–	21.0
		1.0–1.5 ha	42.0	42.0	10.0 (23.8)	32.0 (76.2)	–	–	–	–	–
		More than 1.5 ha	332.3	41.5	59.3 (17.8)	267.0 (80.3)	–	–	–	–	6.0
	Agriculture land	Less than 0.5 ha	51.4	8.6	15.6 (30.4)	8.0 (15.6)	2.0	–	3.8	–	22.0
		0.5–1.0 ha	23.2	7.7	11.0 (47.4)	4.2 (18.1)	7.0	–	–	–	1.0
		1.0–1.5 ha	131.3	26.3	26.8 (20.4)	102.4 (78.0)	–	–	2.1	–	–
		1.5–2.0 ha	7.2	7.2	0.7 (9.7)	5.0 (69.4)	1.5	–	–	–	–
		More than 2.0 ha	501.5	62.7	5.0 (1.0)	423.5 (84.4)	–	20.0	16.0	–	6.0
Muju County	Total (22)	399.1	18.1	193.9 (48.6)	134.9 (33.8)	–	18.0	–	3.0	33.4	
	30's	42.0	42.0	12.0 (28.6)	–	–	–	–	–	30.0	
	40's	82.9	20.7	24.0 (29.0)	40.9 (49.3)	–	18.0	–	–	–	
	50's	50.5	16.8	16.5 (32.7)	33.0 (65.3)	–	–	1.0	–	–	
	60's	125.7	25.1	83.0 (66.0)	23.5 (18.7)	–	–	15.0	3.0	1.2	
	Over 70	98.1	10.9	58.4 (59.5)	37.6 (38.3)	–	–	–	–	2.2	
Wild grapes	Less than 0.5 ha	167.4	12.0	65.9 (39.4)	81.2 (48.5)	–	18.0	–	–	2.3	
	0.5–1.0 ha	70.0	14.0	26.0 (37.1)	11.0 (15.7)	–	–	1.0	3.0	30.0	
	1.0–1.5 ha	121.1	40.4	93.0 (76.8)	13.1 (10.8)	–	–	15.0	–	–	
Agriculture land	Less than 0.5 ha	24.9	6.2	23.0 (92.4)	0.8	–	–	–	–	1.1	
	0.5–1.0 ha	150.0	21.4	85.4 (56.9)	33.5 (22.3)	–	–	–	–	31.1	
	1.0–1.5 ha	153.2	21.9	63.0 (41.1)	53.0 (34.6)	–	18.0	15.0	3.0	1.2	
	1.5–2.0 ha	29.0	14.5	7.5 (25.9)	21.5 (74.1)	–	–	–	–	–	
	More than 2.0 ha	42.0	21.0	15.0 (35.7)	26.0 (61.9)	–	–	1.0	–	–	

Note: 1) The number in parenthesis is the ratio

2) The number in parenthesis is the number of households

maintaining the current level or reduction were lack of labor and no budget. In Muju County, 19 households answered to maintain the current level and 2, expand. As for forestry production, 4 and 2 households in Paju City and Muju County, respectively, wanted to expand. However, no household wanted to manage forestry. The main reasons for forestry expansion were herbal plant growth, fruit planting and resort construction. However, 5 of those who wanted to manage land and forestry expansion in both regions were in their 30's and 40's (Table 7).

Status of Wild Grape Cultivation

Status of Wild Grape Cultivation

The size of wild grape cultivation in Paju City was 0.9 ha per household, which was about twice as large as that in Muju County at 0.5 ha, because 5 households among 23 surveyed owned 2.8 ha in Paju City (Table 8).

Status of Wild Grape Production

As for wild grape production in both regions in 2005 based on the grade, Paju city harvested a total of 106,050,000 won with the premium grade being 37%, medium grade 31%, and low grade 20%. Those farmers in their 40's and 50's produced about 60% of premium grade wild grapes but those in their 60's and 70's, only about 20% level. However, there were not significant difference in wild grape cultivation size and agriculture

land. Unlike Paju City, other individual sales were responsible for 54% of sales in Muju County and were responsible for more than 50% according to each factor and grade (Table 9). Generally, the production of wild grapes started from middle of September in both regions, and they were sold by grades like 5 million won with premium, 4 million with medium, and 3 million won with low grade.

Status of Production Cost

Herbal treatment and compost were responsible for the majority of material cost for wild grapes at 81% and 90% in Paju City and Muju County, respectively. The average material cost for each household was 2.41 million won in Paju City and 970,000 won in Muju County. It was larger in both regions as the size of wild grape cultivation increased (Table 10). On the other hand, 14 households in Paju City built a partial or complete facility preventing rain affecting early falling and brix level, whereas no household used this facility in Muju County.

The majority of labor cost went in for harvesting in Paju city and Muju County was 38% and 36%, respectively, followed by pruning and land lease. The average labor cost per each household was 1.92 million won in Paju City and 480 thousand won in Muju County, showing more labor cost as the size of cultivation increased. In Muju County, the material cost and labor cost out of

Table 7. Future plan on agriculture and forestry

Unit: household

Classification	Size of agriculture land					Size of forestry				Heirs			
	Total	Expan- sion	Current level	Reduc- tion	No answer	Total	Expan- sion	Current level	No answer	Total	Heir	No heir	
	Paju City	Total (23)	23	4	17	-	2	23	4	-	19	23	3
	30's	2	1	1	-	-	2	2	-	-	2	-	2
	40's	2	-	2	-	-	2	-	-	2	2	-	2
	50's	5	2	2	-	1	5	2	-	3	5	1	4
	60's	7	1	6	-	-	7	-	-	7	7	1	6
	Over 70	7	-	6	-	1	7	-	-	7	7	1	6
Muju County	Total (22)	22	2	19	1	-	22	2	19	1	22	-	22
	30's	1	-	1	-	-	1	1	-	-	1	-	1
	40's	4	2	2	-	-	4	1	2	1	4	-	4
	50's	3	-	3	-	-	3	-	3	-	3	-	3
	60's	5	-	5	-	-	5	-	5	-	5	-	5
	Over 70	9	-	8	1	-	9	-	9	-	9	-	9

Note: The number in parenthesis is the number of households

Table 8. Wild grape cultivation size

Unit: ha

Classification	Total	Average household	Less than 0.5ha	0.5-1.0ha	1.0-1.5ha	More than 1.5ha
Total	32.4 (45)	0.7	6.6 (22)	8.5 (14)	4.8 (4)	13.8 (5)
Paju City	21.6 (23)	0.9	2.5 (8)	5.3 (9)	1.0 (1)	13.8 (5)
Muju County	10.8 (22)	0.5	4.1 (14)	3.2 (5)	3.5 (3)	-

Note: The number in parenthesis is the number of households

the total production cost was 16%, whereas they were responsible for 94% in Paju City because most cost went early stage but the production level decreased significantly due to hailstone right before harvest (Table 11). On the other hand, those farmers in Paju City were compensated with goods, such as fertilizers and pesticides for hailstone damage, whereas there were farms that abandon recovery due to lack of compensation and budget for facility preventing rain damage. Although there was mild hailstone in Muju County, no compensation was made (Table 11).

Status of Wild Grape Sales Distribution and Production Facilities

In Paju City, 90% of wild grapes produced was supplied to the processing center within the region, and those in their 30's sold their harvest through camps attracting people to enjoy forest. In Muju County, 40% was sold to processing centers but more than 50% was sold directly with each farmer processing wild grapes into juice and wine or fruits. Most sold directly to those people they knew through their children and relatives

and were pessimistic about direct sales. Farmers in both regions did not have a cooperative center to secure distribution channel or through the Internet for better profits. Especially, the processing centers in Muju County were buying less at lower cost so that the farmers were concerned with securing proper distribution channels (Table 12).

On the other hand, machinery owned by households for the production of wild grapes and agricultural products in 45 households showed that they owned 30 management equipment, 17 dryers and 11 cultivators. Dryers were used more for agricultural products other than wild grapes, and only 2 households owned cooling system in Paju City that could increase the possibility of distribution channels by controlling the amount released (Table 13).

Wild Grape Production Plan

Among 23 households in Paju City, only 2 were planning to expand their wild grape cultivation, 18 to maintain at the current level, and 3 to reduce. Among those 3 households that were planning to reduce their culti-

Table 9. Production amount according to grades

Unit: 10,000 won

Classification		Total	Household avg.	Premium	Medium	Low	No grade\	Others
Paju City	Total (23)	10,605 (100.0)	461.1	3,883 (36.6)	3,237 (30.5)	2,115 (19.9)	300 (2.8)	1,070 (10.1)
	Age							
	30's	1,400	700.0	120	200	80	-	1,000
	40's	3,800	1,900.0	2,190	880	730	-	-
	50's	905	181.0	500	365	40	-	-
	60's	2,320	331.4	603	1,102	615	-	-
Over 70	2,180	311.4	470	690	650	300	70	
Muju County	Total (22)	19,390 (100.0)	881.4	3,814 (19.7)	363.2 (1.9)	4,526 (23.3)	180 (0.9)	10,506.8 (54.2)
	Age							
	30's	1,200	1,200.0	150	-	-	-	1,050
	40's	2,400	600.0	372	205.2	740	-	1,082.8
	50's	1,650	550.0	432	68	150	-	1,000
	60's	8,300	1,660.0	1,330	-	3,466	-	3,504
Over 70	5,840	648.9	1,530	90	170	180	3870	

Note: The number in parenthesis is the number of households

Table 10. Status of production cost (Material cost)

Unit: 10,000 won

Classification		Total	Household avg.	Herval treatment, fertilizer	Plastic	Electricity	Oil	Box
Paju City	Wild grapes							
	Total	5,553 (100.0)	241.4	4,483 (80.7)	746 (13.4)	270 (4.9)	4	50
	Less than 0.5 ha	281	35.1	69	212	-	-	-
	0.5-1.0 ha	533	59.2	439	34	10	-	50
	1.0-1.5 ha	425	42.5	195	200	30	-	-
More than 1.5 ha	4,314	862.8	3,780	300	230	4	-	
Muju County	Wild grapes							
	Total	2,128 (100.0)	96.7	1,920 (90.2)	60	8	70	70
	Less than 0.5 ha	638	45.6	579	-	4	20	35
	0.5-1.0 ha	540	108.0	445	60	-	-	35
1.0-1.5 ha	950	316.7	896	-	4	50	-	

Note: The number in parenthesis is the ratio (%)

vation size, each one was in the 30's, 40's and 50's. The size of cultivation was 1.0–1.5 ha in 1 household and more than 1.5 ha in 2 households. The size of agricultural land was more than 2.0 ha in 2 households. Thus, these households had relatively large wild grape cultivation and agricultural land. In Muju County, 15 households reported to maintain the current size, 7 to reduce and none to expand. Among those 7 household planning

to reduce, 4 were in their 60's and over 70 years age, 5 had less than 0.5ha of cultivation size, but the size of agricultural land varied. However, most of the households who answered to maintain their cultivation size, because their could not find more appropriate product despite lack of labor, difficulty in finding distribution channels, and reduction in wild grape cost and harvest (Table 14).

Table 11. Wild grape production cost (labor cost)

Unit: 10,000 won

Classification	Total	Household avg.	Harvest	Pruning	Land lease	Food	Herbicide	Fertilizer	Rain-gear	Machine lease	
Paju City	Total	4,422 (100.0)	192.3	1,668 (37.7)	705 (15.9)	648 (14.7)	543	510	247	58	43
	Less than 0.5 ha	243	30.4	74	20	103	16	-	-	30	-
	0.5–1.0 ha	470	52.2	280	21	75	51	-	-	-	43
	1.0–1.5 ha	143	143.0	114	-	-	29	-	-	-	-
	More than 1.5 ha	3,566	713.2	1,200	664	470	447	510	247	28	-
Muju County	Total	1,046 (100.0)	47.5	373 (35.7)	303 (29.0)	191 (18.3)	143	-	6	-	30
	Less than 0.5 ha	306	21.9	117	90	63	30	-	6	-	-
	0.5–1.0 ha	227	45.4	60	96	38	3	-	-	-	30
	1.0–1.5 ha	513	171.0	196	117	90	110	-	-	-	-

Note: The number in parenthesis is the ratio (%)

Table 12. Status of sales and distribution

Unit: 10,000 won

Classification	Total	Fruit sales				Processed goods sales		
		Processing centers	Sold to health centers	Direct sales at camps	Sales to Fruit distributors	Juice and wine sales		
Paju City	Total (23)	10,605 (100.0)	9,535 (89.9)	70 (0.7)	1,000 (9.4)	-	-	
	Age	30's	1,400	400	-	1,000	-	-
		40's	3,800	3,800	-	-	-	-
		50's	905	905	-	-	-	-
		60's	2,320	2,320	-	-	-	-
		Over 70	2,180	2,110	70	-	-	-
	Wild grape	Less than 0.5 ha	910	910	-	-	-	-
		0.5–1.0 ha	2,770	2,700	70	-	-	-
		1.0–1.5 ha	1,000	1,000	-	-	-	-
		More than 1.5 ha	5,925	4,925	-	1,000	-	-
Muju County	Total (22)	19,390 (100.0)	9,457 (48.8)	2,170 (11.2)	-	2,300 (11.9)	5,463 (28.2)	
	Age	30's	1,200	150	-	-	-	1,050
		40's	2,400	1,317	-	-	-	1,083
		50's	1,650	650	-	-	-	1,000
		60's	8,300	5,030	2,170	-	-	1,100
		Over 70	5,840	2,310	-	-	2,300	1,230
	Wild grape	Less than 0.5 ha	6,590	4,161	-	-	-	2,429
		0.5–1.0 ha	3,500	1,216	-	-	-	2,284
		1.0–1.5 ha	9,300	4,080	2,170	-	2,300	750

Note: 1. The number in parenthesis is the ratio (%)
 2. The number in parenthesis is the number of households

Table 13. Status of equipment used for wild grape production

Classification		Total	Spra- yers	Trac- tors	Management equipment	Brush Cutter	Dryers	Cooling facility	Farm tools	Culti- vators	Com- bines
Total		47	1	7	14	1	10	2	2	9	1
Paju City	Less than 0.5 ha	3	-	-	1	-	2	-	-	-	-
	0.5-1.0 ha	12	-	-	6	-	3	-	-	3	-
	1.0-1.5 ha	6	-	1	1	-	1	-	-	3	-
	More than 1.5 ha	26	1	6	6	1	4	2	2	3	1
Total		31	-	-	16	-	7	-	-	2	1
Muju County	Less than 0.5 ha	24	-	-	11	-	6	-	-	2	1
	0.5-1.0 ha	3	-	-	3	-	-	-	-	-	-
	1.0-1.5 ha	4	-	-	2	-	1	-	-	-	-

Note: The number in parenthesis is the ratio (%)

Table 14. Exports and imports of oak mushrooms

Classification		Size				
		Total	Expand	Current level	Reduc	
Paju City	Age	Total (23)	23	2	18	3
		30's	2	-	1	1
		40's	2	-	1	1
		50's	5	2	2	1
		60's	7	-	7	-
		Over 70	7	-	7	-
	Wild grape	Less than 0.5 ha	8	1	7	-
		0.5-1.0 ha	9	1	8	-
		1.0-1.5 ha	1	-	-	1
		More than 1.5 ha	5	-	3	2
Muju County	Age	Total (22)	22	-	15	7
		30's	1	-	-	1
		40's	4	-	3	1
		50's	3	-	2	1
		60's	5	-	4	1
		Over 70	9	-	6	3
	Wild grape	Less than 0.5 ha	14	-	9	5
		0.5-1.0 ha	5	-	4	1
		1.0-1.5 ha	3	-	2	1

Note: The number in parenthesis is the number of households

CONCLUSION

1. Those labor in Paju City and Muju County were older than 60's at 61% and 64%, respectively; the average agricultural land size per household was 1.6 ha and 1.0 ha, respectively; and more land was purchased than selling in which the land purchased was 3-5 times more than land sold in both regions.
2. The average income per household was 31 million won and 18 million won in Paju City and Muju County, respectively, so that it was less than 60% in Muju County compared with Paju City. In 2004, the average income in rural family and urban family was 29 million won and 37 million won, respectively. The rate income coming from wild grape was 15% in Paju City and 49% in Muju County.
3. For future planning, 7 households out of 23 in Paju City and 14 out of 22 in Muju County selected wild

grapes as the main crop for their future. However, 6 out of 45 wanted to expand the size of cultivation of forestry for the cultivation of herbal plants and fruits. But none of the households wanted to manage forestry.

4. The average size of wild grape cultivation in Paju City and Muju County was 0.9 ha and 0.5 ha, respectively. In 2005, the average cost of production per household was 4.61 million won and 8.81 million won, respectively. The ratio of materials and labor cost in Paju City and Muju County was 94% and 16%, respectively.
5. In Paju City, 90% of total wild grapes produced was sold to processing plants in the region. But 51% in Muju County was sold by the individual grower. Only 2 households in Paju City and none in Muju County had a cooling storage system, and 14 households in Paju City had a partial or complete rain guard system but none in Muju County.

6. 3 households and 7 in Paju City and Muju County, respectively, were planning to reduce the cultivation size but most planned to maintain the current level.

The following are the challenges found by reviewing the results of this study.

1. Rain guard and pest controlling systems and eco-friendly method of cultivation are needed to produce premium wild grapes, requiring systematic techniques to cultivate wild grapes.
2. In order to secure stable income level, wild grape growers need not be dependent upon those local buyers, and should find other methods of distribution such as selling wild grapes through camps hosted by jointly by growers by forming a cooperative and develop new methods of distribution such as through the Internet. Moreover, more publicity is needed to promote wild grape wine, which is recognized by the public less than traditional Korean or fruit wines.
3. There is a problem in storing fresh wild grapes but wild grape juice or wine could be stored for long time so they could be sold throughout the year and open up further markets. However, wine in Muju County was produced by each household so its taste is different with no standard methods of making wild grape wine so that measures are needed to overcome this problem.
4. The quality of fresh fruits stored at room temperature goes down with insect development, and they could not be sold individually. Thus, support and research are needed to build a long storage system to store and expand distribution channels of wild grapes that are produced throughout Korea almost at the same time.
5. Currently, processing plants play a significant role in providing the basis for wild grape production by purchasing wild grapes. However, inventory increases and lack of sales will affect growers significantly.

Thus, financial and facility support is needed for long-term storage system that could add value to wild grapes such as storing them in wine.

6. In Paju City, hailstone damage was paid with goods such as fertilizers and pesticides and no support was given to damaged facility so that some growers abandoned growing wild grapes altogether. Thus, local governments should provide a certain level of cost for recovering from natural disasters.
7. Lastly, wild grapes drawing attention as a short-term income generating crop as a forestry product, giving a competitive edge to Korean farmers for the Uruguay Round, can not be sold readily and prepossessing plants have a difficulty distributing their goods. Thus, those farms cultivating wild grapes are considering to reduce cultivating size, concerned over distribution channels and lag willingness. Nonetheless, the demand is not expected to rise sharply in recent future due to price drop, competition with imported wine, and public not being aware of wild grapes. Furthermore, wild grape growers are faced with financial burden and labor shortage with no definite distribution channel on top of a difficulty finding a substitute crop.

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