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ANALYSIS IN TERMS OF APPLE PRODUCERS OF GOVERNMENT SUPPORTED CROP INSURANCE POLICIES AS A RISK MANAGEMENT TOOL IN TURKEY

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Abstract. Agricultural insurance is one of the possible measures to meet the risks that may occur because of the natural disasters and to ensure continuity of production in agricultural sector. This study was conducted to evaluating the results of government supported crop insurance (GSCIS) policies in terms of the apple producers and to determine characteristics of both farms participating and non-participating in government supported crop insurance system in the Isparta province of Turkey. The data used in the study was obtained from 77 apple producers by using a questionnaire. The farms were chosen by random sampling method and the data were analyzed by the chi-square test which was used to test relationship among variables. The result of the analyses showed that there is a significant difference between the farms participating and non-participating in GSCIS, considering social security status, farmer's experience, membership of a cooperative, agricultural income level, non agricultural income status, agricultural advisory status, internet use, agricultural credit use, tractor ownership, farmers' experience in apple production, shapes of apple orchards and varieties of apples grown. In conclusion it is suggested that effective service delivery by insurance service providers will ensure continuity of producers' participation in agricultural insurance and also participation by producers who are yet to participate. Producers should be informed and be aware of the studies about government supported crop insurance.

Key words: crop insurance, apple farms, participation insurance, risk management

INTRODUCTION

Agriculture is an important sector in Turkish economy and horticulture is a crucial fragment. Turkey has a suitable climate for growing many fruits. The major fruits are hazelnut, apple, apricot, fig, citrus, cherry, walnut, pistachio and olive in Turkey. Apple is a product of economic importance in Turkey and World. According to 2011 FAO

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statistics, apple production in the world was realized in 4.7 million ha area. In the same year, the apple production in the world was 75.4 million tones. The most important share in production belongs to China (47.7%), USA (5.7%), India (3.8%) and Turkey (3.6%), respectively. Turkey comes fourth in terms of apple production with 3.6 % of the total production of the world [FAOSTAT 2013]. However, Turkey's apple exports are not at a satisfactory level, corresponding to its status in the world. This fact can be attributed to several facts, such as varieties grown, characteristics of apple farms, infra structural facilities and product quality.

Agricultural production has always been exposed to many risks. The main groups of risks result from the specific characteristics of the agricultural sector and from the trends in the agricultural policy the risks connected with the effectiveness of the market, the risks connected with adverse weather conditions and livestock infections, the financial risks and the institutional risks resulting from policy modifications [Spicka et al. 2009].

Natural events are no longer regarded as a catastrophe due to applications of "Agricultural Risk Management Techniques" and infrastructural works long launched by developed countries. These countries have developed their crop insurance systems based on their own natural, social, and basic economic structures as well as their agricultural policies and thereby provided their producers with economic and social security by making them capable of covering financial losses with a little expense [Dinler 2000].

Agricultural insurance is usually perceived by policy-makers as a means of providing a safety net for farmers or even increasing their revenues. Agricultural insurance cannot solve problems of low in income level and poverty by itself. Although it can sometimes help channeling additional social benefits to targeted farmers, it should not be considered an instrument that can provide poor farmers with higher revenues [Mahul and Stutley 2010].

The most widely used insurance program in the world is "multi-peril crop insurance". There are "coinsurance pools", which enables risk sharing, in Spain, Turkey, China and S. Korea. Agricultural insurance agencies in the world concentrate on difficult to manage risks such as frost, hail, fire, flood, etc. Developed countries have special funds for catastrophic risks as drought. Deficiencies of management on disease and pests, which are among controllable risks to some extent, cause a reduction in producer incomes and product losses [Dismukes et al. 2006].

The agricultural insurance system has had an important position in agriculture sector of Turkey, recently. Traditional or informal risk management arrangements cannot provide protection against high frequency risks in Turkey such as hail, frost, floods and droughts. To solve this problem in agriculture, several kinds of attempts were made to establish a risk management system, which would be the main instrument of agricultural insurance system in Turkey [Ucak and Berk 2009].

The new agricultural insurance system has been formed by the contributions of government, private agencies, and organizations which have run activities in the field of insurance and agriculture. Main feature of the new agricultural system is the inclusion of an agricultural insurance pool. In agricultural insurance which is the main protection measure for natural disasters occurring in agricultural production, crop insurance premium paid by farmers is being supported by the government, which included in 50% of

the premium with "Agricultural Insurance Act" published since 2006 [TSRSB 2006]. Government supported "crop insurance" covers the amount loss caused by the risks which are hail, storms, hurricanes, fires, earthquakes and landslides in the open areas for planting all crop products, as an optional addition to the above-mentioned risks, "frost risk" with the amount loss for fruits and quality loss caused by for the "hail" risks for vegetables, fruit and cut flowers. Despite supporting farmers by financing 50% of agricultural insurance premiums by government, practice of agricultural insurance is not developed well-enough. Proportion of the insured in agriculture was so low, 7.9% in total utilized agricultural area and 3% in animal numbers [TARSIM 2013].

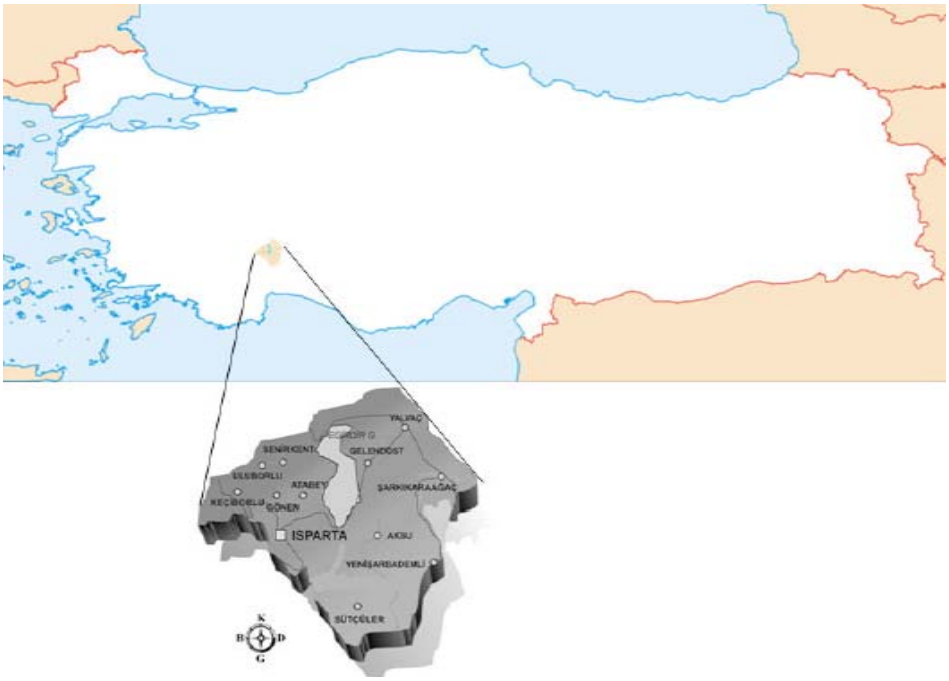

Fig. 1. Map of Isparta province (Turkey)

Apples can be grown in almost all parts of the Turkey and apple production constitutes 9% of total fruit areas and 20% of total fruit production. 23.4% of the total apple production of Turkey is supplied from Isparta province [TURKSTAT 2012]. Apple plays a key role in the economy of Isparta. In Isparta, agricultural land is 178 162 ha; 37 184 ha of agricultural lands is allocated to fruit growing (28.8% of total area) in province. Egirdir, Gelendost and Senirkent districts are significant apple producers in Isparta province. These three districts cover 73.2% of total apple production in Isparta province. Because of soil structure and climatic conditions, produced apple in Isparta are very tasty and sweet. These apples are demanded a lot by consumers, because of its specific aroma and flavors. However, due to excess supply, price is low in the apple harvest season. Improving production is quite significant, but marketing is also equally

significant for a commercial fruit like apple, which is purely produced to sell in the market. Although there many-sided efforts to increase to production of apple in province, marketing has not received proper attention apple market is not regulated in province.

Most professional papers are devoted to the issue of agricultural insurance as the most active and functional tool supporting stability in the field of agricultural business. The aim of this study was to evaluate the results of government supported crop insurance (GSCI) policies in terms of the apple producers and to determine characteristics of both farms participating and farms non-participating farms in government supported crop insurance system in Isparta, the province of Turkey. The data collected from the producers was analyzed by using descriptive statistics and chi-square test.

MATERIALS AND METHODS

The data used in the study was obtained from the questionnaires administered to the producers at apple farms in the Isparta province. The questionnaire was implemented in October 2012 with 77 randomly selected apple producers in Isparta province, Eğirdir, Senirkent and Gelendost and 9 villages in these districts were selected to represent the apple growing area [FALM 2012]. The study population comprised apple farms in those villages that met the inclusion criteria. The data was obtained from technical personnel in the Isparta Provincial Agricultural Administration and from the records of the apple farming sector, which selected as the study areas. Districts chosen for research purpose constituted 73.4% of apple production in Isparta province [TURKSTAT 2011]. For sampling, growers were randomly selected from the villages using the stratified random sampling method [Yamane 2001]. Sampling size was determined by using Eq. 1. The permissible error was defined to be 5% for 95% reliability.

$$n = \frac{\left(\sum N_h S_h\right)^2}{N^2 * D^2 + \sum N_h {S_h}^2} \tag{1}$$

where:

n – sampling size,

N_h = number of farms in h^{th} ,

S_h = standard deviation of h^{th},

S_h^2 = variance of h^{th},

N = population size,

$D^2 = (d/z)^2$, where d – deviation (5%) from mean (X = 18.19), z – standard normal distribution value (1.96) that corresponds to 95% probability.

Analysis. Descriptive and inferential statistics were used to analyze the data collected. Demographic characteristics of farmers were analyzed using percentages and frequencies. Significant relationships between selected variables were established using chi-square statistics. The data obtained from the farms w analyzed with the SPSS software program and are shown in tables. The SPSS software program was also used to determine significance levels of the variables. Contingency tables were prepared to

evaluate the association between the variables and Chi-square test (χ^2) was used to analyze the relationship between the socio-economic variables.

RESULTS AND DISCUSSION

General characteristics of the farms

The average apple production area of the investigated farms was 2.3 ha. The average age of the manager within the farm was 48.8 years. The average education level of managers was 8.2 years. The average experience of farmers in agriculture was 26 years and average duration of apple farming is 25.2 years, the average age of the apple orchard was 24.8 year. It was found that 79.0% of the farmers were members of a cooperative. The average household size was 4.4 people. The population of the family working in apple farming activities was 2.1 people (tab. 1).

Table 1. General characteristics of the farms.

Characteristics	Mean	Standard deviation
Apple Production area (ha)	2.3	1.4
Farmers age (year)	48.8	11.7
Education level (year)	8.2	2.9
Farmers' experience in agriculture (year)	26.5	13.3
Farmers' experience in apple production (year)	25.2	10.7
Age of the apple orchard (year)	24.8	10.8
Agricultural cooperative membership (%)	79.0	–
Family population (person)	4.4	1.7
Family population working on apple growing (person)	2.1	1.1

The result of the chi-square test analysis according to socio-economic characteristics of farmers'

Table 2 shows that chi-square (χ^2) test of relationships between farmers both participating and non-participating in government supported crop insurance system and their selected socio-economic characteristics. It was found that 57.1% of the apple farmers participated in while 42.9% of the farmers did not participate in the crop insurance system. The study results show that according to χ^2 test results applied to find out whether there are any differences in the socio-economic characteristics of farmers' both participating and non-participating in government supported crop insurance system, it was found out that there is a significant relationship among the variables of social security status, farmer's experience, membership of a cooperative, agricultural income level, non

Table 2. Results of chi-square (χ^2) showing associations between participating crop insurance of farmers and the selected socio-economic characteristics of the farmers

Characteristics	Farmers participating in crop insurance		Farmers non-participating in crop insurance		χ^2	*P*
	N	*%*	*N*	*%*		
Age of farmers					3.72	0.16
<30	4	9.1	6	18.2		
31–60	32	72.7	17	51.5		
61+	8	18.2	10	30.3		
Education level					1.99	0.37
primary school	13	29.5	14	42.4		
middle school	15	34.1	7	21.2		
high school or university	16	36.4	12	36.4		
Social security status					26.04	0.00*
no	3	6.8	20	60.6		
yes	41	93.2	13	39.4		
Farmer's experience (year)					5.14	0.08***
5–15	8	18.2	13	39.4		
15–30	21	47.7	9	27.3		
30+	15	34.1	11	33.3		
Membership of a cooperative					39.96	0.00*
no	1	2.3	23	69.7		
yes	43	97.7	10	30.3		
Agricultural income level (TL)[a]					38.96	0.00*
0–20 000	7	15.9	17	51.5		
21 001–40 000	8	18.2	10	30.3		
40 001–50 000	10	22.7	3	9.1		
50 001+	19	43.2	3	9.1		
Non agricultural income status					13.12	0.00*
no	15	34.1	25	75.8		
yes	29	65.9	8	24.2		
Agricultural advisory status					19.82	0.00*
no	20	45.5	31	93.9		
yes	24	54.5	2	6.1		
Internet use					4.07	0.05**
no	25	56.8	26	78.8		
yes	19	43.2	7	21.2		
Agricultural credit use						
no	11	25.0	21	63.6	11.59	0.00*
yes	33	75.0	12	36.4		
Tractor ownership					8.27	0.00*
yes	39	88.6	20	60.6		
no	5	11.4	13	39.4		

[a] (1 TL = 1.76 US $) * $p < 0.01$, ** $p < 0.05$, *** $p < 0.10$

Table 3. Results of chi-square (χ^2) showing associations between participating crop insurance of farmers and the selected apple growing characteristics of farmers'

Characteristics	Farmers participating in crop insurance		Farmers non-participating in crop insurance		χ^2	P
	N	%	N	%		
Apple Production area (hectare)					1.22	0.55
1.0–2.0	26	59.1	22	66.7		
2.1–4.0	12	27.3	9	27.3		
4.1+	6	13.6	2	6.1		
Farmers' experience in apple production (year)					5.14	0.08***
5–25	21	47.7	22	66.7		
26–45	21	47.7	6	18.2		
46+	2	4.5	5	15.2		
Age of the apple orchard (years)					5.29	0.15
2–10	4	9.1	5	15.2		
11–20	14	31.8	15	45.5		
21–30	17	38.6	5	15.2		
31–50	9	20.5	8	24.2		
Shapes of apple orchards					12.84	0.00*
orchard	37	84.1	15	45.5		
mix	7	15.9	18	54.5		
Type of apple orchards					3.46	0.18
standard	7	15.9	11	33.3		
dwarf	16	36.4	8	24.2		
semi dwarf	21	47.7	14	42.4		
Varieties of apples grown					7.83	0.02**
golden	44	52.4	31	47.0		
starking	39	46.4	27	40.9		
granny smith	1	1.2	8	12.1		

* $p < 0.01$, ** $p < 0.05$, *** $p < 0.10$

agricultural income status, agricultural advisory status, internet use, agricultural credit use, tractor ownership. On the other hand, it was found that there is not a significant relationship for age of farmers and education level variables (tab. 2). Another study found that age, educational level, farm size and accessibility to credit were significant variables that influenced the probability of participation of the farmers in agricultural insurance scheme while household size, membership of association and contacts with extension agents were found to be insignificant in influencing the farmers participation in Agricultural insurance scheme [Oyinbo et al. 2013].

The result of the chi-square test analysis according to apple growing characteristics of farmers'

Table 3 shows that chi-square (χ^2) test of relationships between farmers participating and non-participating in government supported crop insurance system and their selected

apple growing characteristics. The study results show that χ^2 test applied to find out whether there are any differences in the socio-economic characteristics of farmers participating and non-participating in government supported crop insurance system, it was observed that there is a significant relationship among the variables of farmers' experience in apple production, shapes of apple orchards and varieties of apples grown. On the other hand, it was found that there is not a significant relationship for apple production area, age of the apple orchard and type of apple orchards variables (tab. 3).

Problems encountered by apple farmers in government supported crop insurance system

Table 4 shows the problems encountered by apple farmers in government supported crop insurance system. The research results showed that the most important problems of farmers in GSCIS were not registered with the farmer registration system, Fruit trees not covering been of the flowering period does not covered by insurance, disputes in evaluation on damage detection used by experts, Too much bureaucratic procedures, high insurance premium, lack of knowledge about government supported crop insurance and lack of trust to insurance company. Another study found that delay in indemnity payment, administrative bottlenecks, delay in assessment of losses, rigorous procedures in claim settlement, inaccessibility to insurance personnel, inadequate information dissemination [Oyinbo et al. 2013]. To prevent these problems, firstly insurer who established a good dialogue with producers and good knowledge of production possibilities and expectations should be trained. Producers should be provided with information and awareness studies about agricultural insurance.

Table 4. Problems encountered by apple farmers

Problems	N*	%	Rank
Not registered with the farmer registration system (with shareholding lands and land register problem reasons)	21	27.3	1st
Fruit trees not covering been of the flowering period does not covered by insurance	18	23.4	2nd
Disputes in evaluation on damage detection used by experts (to be high of exemption rates after damage)	13	16.9	3rd
Too much bureaucratic procedures	11	14.3	4th
High insurance premium	9	11.7	5th
Lack of knowledge about government supported crop insurance	6	7.8	6th
Lack of trust to insurance company	5	6.5	7th

* Multiple responses allowed. N = 83

CONCLUSIONS

The research results showed that 57.1% of the apple farmers participated while 42.9% of the farmers did not participate in the crop insurance system. The result of the

chi-square test analysis showed that of social security status, membership of a cooperative, agricultural income level, non agricultural income status, agricultural advisory status, agricultural credit use, tractor ownership of farmers, shapes of apple orchards in government supported crop insurance system at 1% and internet use, varieties of apples grown variables at 5% and also, farmer's farming experience, farmers' experience in apple production variables at 10% level of significant while age of farmers, education level, apple production area, age of the apple orchard and type of apple orchards were found to be insignificant in influencing the farmers' participation in government supported crop insurance system.

In Turkey proportion of the insured in agriculture was very low. This rate was 7.9% in total utilized agricultural area and 3% in animal numbers. Therefore, this is quite indicative of the enormous insurance potential that exists for addressing the needs of the farming community and enhancing the overall efficiencies as also the competitiveness of the agriculture sector. This also signifies the tremendous potential of agriculture insurance in the Turkey as a concept, which can mitigate the adverse impacts that such uncertainties would have on the individual farmers.

In the context of the agricultural policy measures, the current subsidies can be considered as a suitable complement to the conventional risk management tools primarily designed to reducing the farmers' and farm income variability.

In conclusion, the damages which are occurred due to the frost and the hail in the flowering time of fruit trees should be covered by insurance. The damages, that are product and loss of quality, which are occurred due to the frost and the hail at the apple trees only cover the current year when it is insured, however it is not considered that the effect of the loss of product at the following year which is occurred by damage at the fruit bud. The fruit trees are long-term investment plants. The damages that can be occurred at the fruit trees are not considered, natural disaster only focus on the product. Yet, as there is animal life insurance at the livestock production, the same implementation should be come into effect on "fruit tree life insurance" considering that there are perennials at the crop production. In addition, from the point of becoming widespread of the crop insurance and to ensure that confidence of the producers' against the agricultural insurance system, it has importance that the works of training and extension which are on about producers' raising tendency of taking out an insurance, especially raising awareness of insurance by using audiovisual media.

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ANALIZA WSPIERANEJ PRZEZ RZĄD POLITYKI UBEZPIECZEŃ PLONÓW JABŁEK JAKO NARZĘDZIA KONTROLI RYZYKA W TURCJI Z PUNKTU WIDZENIA PRODUCENTÓW

Streszczenie. Ubezpieczenie rolnicze to jeden z możliwych środków zarządzania ryzykiem, które może wystąpić z powodu katastrof naturalnych, oraz sposób zapewnienia ciągłości produkcji w sektorze rolniczym. Niniejsze badanie przeprowadzono w celu oceny wyników polityki ubezpieczeń plonów (GSCIS) z punktu widzenia producentów oraz w celu określenia cech zarówno gospodarstw uczestniczących, jak i nieuczestniczących w systemie ubezpieczeń plonów wspieranym przez rząd w prowincji Isparta w Turcji. Dane używane w badaniu uzyskano od 77 producentów jabłek za pomocą kwestionariusza. Farmy wybrano losową metodą próbek, natomiast dane przeanalizowano testem chikwadrat, który zastosowano w celu sprawdzenia relacji między zmiennymi. Wyniki analiz pokazały, że istnieje istotna różnica między gospodarstwami uczestniczącymi i nieuczestniczącymi w GSCIS jeśli chodzi o status bezpieczeństwa społecznego, doświadczenie rolnika, członkowstwo w spółdzielni, poziom dochodu rolnego, status dochodu nierolniczego, status doradztwa rolniczego, korzystanie z Internetu, korzystanie z kredytów rolniczych, posiadanie traktorów, doświadczenie rolników w produkcji jabłek, kształt sadów jabłoniowych oraz odmiany hodowanych jabłek. Wnioski sugerują, że efektywne usługi dostawców ubezpieczeń zapewnią ciągłość uczestnictwa producentów w ubezpieczeniach rolniczych, a także uczestnictwo producentów, którzy jeszcze nie są uczestnikami tych ubezpieczeń. Producenci winni posiadać informacje oraz świadomość dotyczącą badań nad wspieranymi przez rząd ubezpieczeniami plonów.

Słowa kluczowe: ubezpieczenia plonów, gospodarstwa produkujące jabłka, uczestnictwo w ubezpieczeniach, zarządzanie ryzykiem

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