

THE EFFECTS OF AGRICULTURAL SUBSIDIES ON SUNFLOWER CULTIVATION AND FARMERS' INCOME: EVIDENCE FROM TURKEY

Arif Semerci

Department of Agricultural Economics, Faculty of Agriculture, Mustafa Kemal University,
Tayfur Sokmen Kampusu, Antakya, Hatay, Turkey

*Corresponding author's e.mail: arifsemerci69@gmail.com

In this study the effects of both premium support application on sunflower cultivation area, production amount and support payments on producer income are investigated. In this study it is concluded that premium supports are inefficient on increasing sunflower cultivation area and production whereas it is concluded that it has an important role on producer income and in the determination of the market price. In fact, from a survey that we have carried out, it emerges that the area-based support (diesel oil, fertilizer etc. support) together with premium support increase the revenue of sunflower up to 27.74% per unit area and the gross profit in the proportion of 98.87%. This study indicates that in order to increase the sunflower production in Turkey the amounts of sunflower premium support, diesel oil and fertilizer should be rearranged in compliance with current market conditions. Moreover, for other agricultural products, the use of certified seed should also be included into agricultural support programmes. Production on well irrigated areas should be widened and the use of oil crops varieties with high oil ratio should be extended.

Keywords: Oil crops, sunflower, agricultural subsidy, farmers' income

INTRODUCTION

Alike food sector, agriculture sector has a significant role in national economics because of its contribution to employment and income, its role in meeting the needs of industrial raw materials and its direct or indirect benefits on exports.

According to 2009 data, in Turkey the agricultural sector accounts for 51 billion US\$ of gross domestic product and sunflower is one of the leading agricultural products for manufacturers and oil industry especially in Thrace, at the European side of the Turkey (MFAL, 2011a,b). Turkey which accounts for 2.46% of sunflower of the world cultivated area and 3.26% of production is among the top ten countries for production of sunflower according to production data from the year 2009 (Anonymous, 2011a). Sunflower which accounts for 3.60% of field crops cultivated areas in Turkey, also meets approximately 55% of vegetable oil production (TURKSTAT, 2011; Ozcelik and Fidan, 2003). Besides, 4.99% of 2328731 farmers in the country are working on sunflower production (MFAL, 2011a). Despite the high agricultural production potential, the self-sufficiency rate of sunflower in our country is only 46.60% (Anonymous, 2011b). In 2008, 3 billion US\$ of vegetable oil and oil seeds was imported in order to meet the current deficit (MFAL, 2009). Because of the low elasticity of demand, exposure to climate conditions, intense economic instability (price and income) of agricultural sector, government interventions are carried in cultivated areas and the sector is diversely supported across the globe (Gunaydin,

2006). Turkey is one of the countries supporting the agricultural sector in line with the various agricultural policies implemented in accordance with the developments in the world (Zemheri, 2010). Use of certified seeds, premium support system, diesel oil and fertilizer compose are the main factors of agricultural subsidy studies in Turkey especially since the early 2000's in order to ensure an increase in the production of products which are in short supply.

The study was carried out in Thrace where approximately 65% of sunflower for oil industry is produced in Turkey. The effect of premium supports on sunflower cultivation areas and amount of production with the aim of increasing oleaginous seeds production was investigated. In addition to this, in the study, it is also put forth the contribution of support payments to manufacturer prosperity for increasing sunflower production.

In some studies conducted in various countries, support of agricultural production and the effects of these supports on agricultural production, farmer's welfare and the trade of agricultural products were analyzed (Hennessy, 1998; Mayrand *et al.*, 2003; Anderson *et al.*, 2006; Keeny, 2009). Some studies conducted in Turkey are related to agricultural support effects on sunflower production, reflection to producer income and foreign trade regime (Gaytancioglu, 1999; Koc, 2005; Ilkdogan, 2008). According to a study based on a 'Theoretical Microeconomic Model' the data for which were obtained from 1000 agricultural enterprises in Norway, it is concluded that agricultural subsidies have significantly positive effects on input use and the level of

output (Henningsen *et al.*, 2009). As a result of research conducted in Czech Republic, despite the country's agriculture having a competitive market, in comparison to some of European countries it emerges that agricultural subsidies have low share in producer income. In the study, it is determined that the lower percentages of support level weaken the competitiveness of agricultural area, and the regeneration and modernization of agriculture. As a result, it is concluded that the subsidies which are applied according to type of production might effect the production diversity (Strelecek *et al.*, 2009).

A Premium support system is an alternative support model that can be applied by assuring stability in the sense of prices and the producer in agriculture of Turkey, depending on the research work of Sahinoz *et al.* (2007). In a study published by the Vegetable Oils and Fats Industrialists Association, sunflower production is supposed to be decreasing at an average annual rate of 6% in the period 2010-2013 whether premium supports which is being paid to oil seed producers in Turkey will not be paid (Koc, 2005). In another study which investigates the effects of premium support systems in terms of agricultural subsidies in Turkey, it is deduced that the subsidy got by farmers has significant effects on increasing the sunflower cultivated area and premium supports paid for sunflower are efficient in protecting the producers against to market prices (Erdal and Erdal, 2008). After 2011 year agricultural production support policies applied in Turkey year have actually changed deeply. A new model of agricultural production and support model (Turkey Agricultural Basin Production and Support Model) has just begun to be implemented in Turkey. The aims of the new model include determination of the agricultural basins, preparation of a clear agricultural inventory, provision of opportunities for production planning, and making projections of demand for the future (Sahin, 2010).

The amount of resources allocated to support agricultural production varies depending on the development levels of countries. Direct payments are the largest item with 74% of agriculture subsidies (approximately €55 billion) in the

European Union's budget in 2008. Direct payments are allocated with a share of 99% to agricultural markets, 0.5% to fisheries sector and 0.5% to plant and animal health. The second largest item which has a 23.5% share with €12.9 billion is rural development. The amount of direct subsidies that USA farmers have received in the years from 1996 and 2001 is 70 billion US\$. In the period from 2002 to 2008, the farmers are estimated to have benefited from direct state assistance of 100 billion US\$ and 80 billion US\$ is planned to be distributed before 2012 (Acar and Bulut, 2009). The amount of resources allocated to agricultural subsidies in 2010 in Turkey is given in the Table 1.

Table 1. Funds allocated to agricultural support in Turkey (2010)

Criteria	US\$ (million)
Premium supports	134.0745
Agricultural support payments	362.7382
Implementation of low interest rate credit	48.7536
Total agricultural support payments	545.5663
Total Gross Domestic Product	66589.1300

Source: Ministry of Food, Agriculture and Livestock of Turkey (MFAL, 2011a); General Directorate for Agricultural Production and Development, Ankara. p.29.

Premium support payments in Turkey in 2010 accounts for 36.95% of agricultural support payments and 24.57% of total agricultural subsidies. The share of total agricultural support payments stood at 0.82% of Gross Domestic Product. The support payments for development of oil seed production in 2008 in Turkey are given based on the products in Table 2. In terms of premium supports the price sunflower seed is ranked second in oil seed support payments in Turkey.

MATERIAL AND METHODS

The primary data used in this study were obtained by questionnaires from specified 571 agricultural enterprises in

Table 2. Premium support payments on oil seed plants and olive (2008)

Products	Number of enterprises	Production area (ha)	Amount due to supports (ton)	Sum of supports (US\$)	Product rate in sum of support (%)
Safflower	292	1399	1733	248552	0.04
Corn for grain	65929	383650	3557650	46460339	8.18
Canola	1610	6868	16704	2403263	0.42
Cotton Unseed	69208	441581	1905437	422260035	74.35
Soybean	950	5199	16180	2647695	0.47
Sunflower	89984	420505	705216	92108143	16.22
Olive	5126	27610	13845	1810883	0.32
Total	227973	1286812	6216765	567938910	100.00

Source: Ministry of Food, Agriculture and Livestock of Turkey (MFAL, 2011a); General Directorate for Agricultural Production and Development, Ankara.

53 locations on the European side of provinces of Edirne, Kırklareli, Tekirdağ, İstanbul and Canakkale with Stratified Random Sampling Method in production period of 2009. In determination of stratified random sampling method, two different techniques are commonly applied by agricultural economic studies. These are: Neyman Method and Proportional Distribution Method (Cicek and Erkan, 1996). Because of the incomppliance of sunflower cultivation areas in locations and enterprises to normal distribution, Neyman Method is used in this research. The equality of Neyman Method is given below (Yamane *et al.*, 2001).

$$n = \frac{\sum (N_h S_h)^2}{N^2 D^2 + \sum N_h (S_h)^2}$$

In the formula;

n: sample size,

N_h : number of units in layer h (frequency of farm size),

S_h : standard deviation of layer h,

N: total number of units,

D: d/z,

d: a certain percentage of deviation from average (1%-5%-10%),

z: degrees of freedom in t-distribution scale (N-1) and expresses "t value" belongs to a certain confidence limit (90%-95%-99%).

Within the scope of the research, the effects of premium supports applied in Turkey on the cultivated areas and production amount of sunflower for the next production period were investigated. To that end, taking account of two periods as premium supported and unsupported, the relationship between cultivation areas and production amount was investigated with "correlation analysis" by using SPSS programme (Green *et al.*, 2000). With this purpose, sunflower production periods in Turkey were divided into two parts; unsupported (1988-1998) and premium supported (1999-2008) and dummy variable is taken to be "0" in 1988-1998 period and taken to be "1" in 1999-2010 period.

In the determination of effects of supports on producer welfare applied for sunflower production; Trakya Birlik's purchase price is taken as product price and the support unit price applied in 2009 by the Ministry of Agriculture and Rural Affairs is taken as the support unit prices. However, in the study, besides the purchase price of sunflower and premium support price, also the unit price variations of diesel fuel, fertilizer (20.20.0 compound fertilizer), seed and agricultural pesticides were researched between the years 1999-2010.

RESULTS AND DISCUSSION

Agricultural supporting policies in Turkey: The objectives of agricultural policies as expressed by governments are mainly: income support for farmers, income stability for

farmers and structural adjustment in rural areas, regional assistance and payments for the provision of public goods such as landscape preservation and wildlife habitat (Fellmann, 2004). Agriculture is one of the sectors targeted for structural reform in order to stabilise the Turkish economy. Aside from promoting allocative efficiency in the agricultural sector, reforms are necessary for fiscal stabilisation. The Agricultural Reform Implementation Project (ARIP) was launched in 2001 and implemented over 2001-08 in Turkey. The project was supported by The World Bank, and was a pre-condition for obtaining support from the International Monetary Fund (IMF) for the macro-economic stabilisation programme, which aimed to reduce the high inflation rate and stabilise the general price level. Under the ARIP, Turkish agricultural policy has been oriented towards closer alignment with the EU's Common Agricultural Policy (CAP).

Under the reform programme implemented in Turkey, measures relating to agriculture have been taken in four main areas: a) reducing output intervention purchases financed from the budget; b) phasing-out price support, credit and fertiliser subsidies, and replacing them with a less-distorting system of Direct Income Support (DIS) for farmers, based on a uniform per-hectare payment; c) withdrawing the state from direct involvement in the production, processing and marketing of crops; and d) making available one-time transition grants to farmers. The DIS scheme was ended in 2009, while the "diesel" and "fertiliser" payments continue. Supporting policies implemented in Turkey can be divided 7 categories: a) *Purchasing prices*, b) *Deficiency payments*, c) *Area payments for hazelnuts*, d) *Compensatory payments*, e) *Agricultural insurance payments*, e) *Livestock support*, f) *Interest concessions* (OECD, 2011).

Agricultural subsidies in developed countries have been for more than three decades a major focus of international trade relations and the major sticking point in trade negotiations. Developing countries, and some developed countries with relatively low rates of subsidization, have pressed for agreements in the WTO that would require substantial reductions in trade-distorting support. WTO rules and disciplines, both in the Uruguay Round Agreement on Agriculture (URAA) and in the draft Doha Round agreement, were designed to address what was generally considered to be the main problem – subsidies in the European Union (EU) and the United States. During the Uruguay Round negotiations and the early years of the Doha Round, developing country subsidies were relatively small and were generally considered to have little effect on international markets. According to DTB report "Turkey's total Aggregate Measure of Support (AMS) for the products and programs examined to be \$7.3 billion in 2010".

The relationship between premium support, cultivated area and production amount of sunflower: In this study, in the

period from 1988 to 2010, it is investigated whether there is a relationship between non-supported period of oil sunflower (1988-1998) and supported period (1999-2010) on sunflower cultivation area and the amount of production. For this purpose, the dummy variable for the unsupported period (1988-1998) is taken to be “0” and for the supported period (1999-2010) is taken to be “1”.

The correlation between dummy variable related to support and sunflower production areas is found to be significant, and the correlation between the dummy variable related to support and the amount of sunflower production is found to be statistically insignificant in this study (Table 3). This situation can be explained with the decline at the ratio of 10.88% on average of sunflower cultivation areas to 559456 ha before supported period (1988-1998) in comparison with the supported period (1999-2010) in Turkey. In other words, the premium support applied for oil sunflower since 1999 is inadequate in preventing the reduction of the cultivation areas which began before the support period. This circumstance also shows that the amount of support given to agricultural production is not in a level sufficient to promote production. Therefore, the enhancement of sunflower plantations can be possible by providing continuous support and satisfactory reorganization to current conditions. As an example, in early 2000's the support policy applied to corn has successfully resulted in making Turkey self-sufficient over a period of 3-5 years whereas before 2000 it was foreign-dependent for corn production.

As a part of the research, attitude and the level of expectations of manufacturers to “Premium Support” are also analysed. 97.25% of manufacturers in the survey (536 Businesses) expressed their opinion that Premium Support applied by Agricultural and Rural Affairs should be continued. The expectation of 69.52% of companies (390 enterprises) for Premium Support unit prices of oil sunflower as a product of the year 2010 was 20.17 cent/kg. However, the expounded Premium Support unit price was 30% lower than the expected value of producers, that is to say 14.12 cent/kg. This shows that the value of stated unit price is far from the manufacturer expectations. In a study carried out on the subject, excepting premium support, diesel fuel and fertilizer support paid in Turkey within the scope of

agricultural support is concluded to be insufficient (Ozcelik and Ozer, 2007).

The variation occurred between 1999-2010 on the prices of sunflower production input and the premium support which has been granted since 1999 in Turkey is given in Table 4. When the data is analysed, it is conspicuous that especially the price of diesel fuel input has increased 5.2 times in the period 1999-2010, while the price increase for the same period was recognized to be 3.5 times for seed, 2.3 times for fertilizer and 1.8 times for pesticides.

Despite 5.1 times increase on unit price of premium support in 2010 in comparison with 1999, the increase in purchasing price of the sunflower seed remained at the level of 2.9 times. Because of the diesel fuel and the product prices lower than the seeds which take important part of the costs, fluctuations are observed on sunflower cultivations areas. In the other studies carried in the region, in accordance with the evidences identified in the study, it is concluded that the purchase price of sunflower has significantly decreased in real terms in response to real increase especially in the price of diesel fuel (Aksoy and Gaytancıoglu, 1996; Semerci and Kaya, 2009).

Effects of applied agricultural supports to producer welfare in sunflower production: In Thrace region sunflower is ranked as the second crop in the production pattern of agricultural enterprises with a proportion of 42.74% after the wheat. The contribution of sunflower to enterprises total agricultural income is calculated to be approximately 30%. These data clearly reveal the importance of sunflower for the producers in the field of research (Sahin *et al.*, 2010). In this context, as well as the contribution of premium support and other support applications to welfare of sunflower producers, product cost reduction effect is also important.

The variations generated by support applications on Gross Production Values and Gross Profit of enterprises are examined by calculating the sunflower income both in per supported and unsupported unit area (ha) with the help of data acquired from 571 agricultural enterprises in scope of the research. In the study, the average sunflower yield of enterprises was calculated as 1.773 tons/ha. In case that the support is disregarded, the average GPV of sunflower is calculated to be 894.24 US\$/ha, variable costs calculated to be 575.54 US\$/ha and Gross Production Value is calculated to be 318.70 US\$/ha (Table 5).

Table 3. The relationship between premium support periods and nonsupported periods with cultivation areas and production amount of sunflower in Turkey

Variables	Criteria	Dummy variable
Sunflower production area (ha)	correlation	-0.535(*)
	significance level	0.008(*)
	observation numbers	23
Sunflower production quantity (ton)	correlation	0.092
	significance level	0.677(*)
	observation numbers	23

* P < 0.01, ** Non-significant.

Table 4. Price variation occurred in the factors that determine product cost, in premium support, and price of sunflower

Years	Fuel (US\$/lt)	Fertilizer (US\$/kg)	Pesticide (US\$/lt)	Seed (US\$/kg)	Sunflower (US\$/kg)	Premium support (US\$/kg)
1999	0.369	0.170	2.948	5.528	0.268	0.029
2000	0.622	0.333	4.000	6.370	0.293	0.048
2001	0.415	0.311	3.111	3.457	0.278	0.022
2002	0.664	0.155	4.019	5.480	0.326	0.046
2003	0.998	0.203	4.706	10.338	0.426	0.080
2004	1.149	0.265	5.191	11.864	0.478	0.096
2005	1.445	0.277	4.817	12.597	0.504	0.130
2006	1.563	0.281	3.874	13.029	0.511	0.141
2007	1.948	0.421	5.127	18.799	0.876	0.171
2008	1.863	0.727	4.624	16.515	0.673	0.125
2009	1.639	0.348	4.684	18.066	0.642	0.141
2010	1.922	0.399	5.178	19.417	0.777	0.149

Resource: Costs of agricultural products in Trakya Region 1999-2010 (MFAL, 2010); Kırklareli Atatürk Soil and Water Resources Research Institute, Kırklareli.

Table 5. Effects of sunflower support payments to producer welfare on enterprices in field of survey (2009)

Sunflower's income (excluding subsidizing payments)	
Number of enterprises (survey)	571.00
Sunflower production area (ha)	5349.75
Production (ton)	9487.08
Yield (ton/ha)	1.77
Price (US\$/ton)	504.27
Gross production value (US\$/ha)	894.24
Variable expenses (US\$/ha)	575.54
Gross profit (US\$/ha)	318.70
Sunflower's income (including subsidizing payments)	
Fertilizer support (US\$/ha)	36.98
Fuel support (US\$/ha)	36.98
Premium support (US\$/ton)	140.00
Price (sales price + premium support price) (US\$/ton)	644.27
Gross production value (US\$/ha)	1,142.29
Total supports (US\$/ha)	322.18
Variable expenses (US\$/ha)	575.54
Gross profit (US\$/ha)	640.71
Share of subsidies in Gross Profit (%)	50.28

Conclusion: Among the farms of the survey, Gross Production Value of sunflower, on an average, reaches the level of 1142.29 US\$ per hectare with an increase of 27.74% on the unsupported level in consideration of the average yield (1.77 ton/ha) and of the payments of oil seed supports. In conjunction with the support payments, sunflower Gross Profit reaches up to the level of 640.71 US\$/ha with a growth of 98.87%. The share of subsidies in "Gross Production Value of New Sunflower" of which it was calculated in consideration of supports is 50.28%. This rate clearly reveals the contribution and importance of support payments on Gross Profit and even in Gross Production Value of sunflower. Today, agriculture sector is supported especially in developing countries. Turkey is one of the

countries that have special emphasis on support of agricultural production. Agricultural support systems which are carried out in Turkey are in accordance with international rules. However, over time, due to the insufficiency of agricultural support policies, innovations of systems and fundamental changes have become inevitable. In the light of developments in recent years, a new agricultural production support system "Turkey Agricultural Basin Production and Support Model" was adopted since 2011 in Turkey. The basic expectations from the new system are to provide an increase in producer income and to meet shortage of products supply (such as oily seeds) with domestic production. Agricultural subsidies for producers in Turkey comprise approximately 6% of total agricultural

production value and 0.82% of GDP. In this case, as of now, the usage of support tools and field based supports and also the compliance with the rule of “de minimis” constitute a hindrance for the country. The study proves that the premium support applied in Turkey has no effect on increasing the cultivation areas of sunflower. It only shows that the supports of diesel fuel and fertilizers have significant increasing effects on producer income and decreasing costs for sunflower with premium supports. In consequence of the study, dissemination of production in watery conditions, encouragement usage of varieties with high oil content, usage of appropriate fertilizer according to results of soil tests, and the seed use should be proposed to be incorporated to agricultural subsidy system for sunflower production like in other products.

REFERENCES

- Acar, M. and E. Bulut. 2009. Recent developments in agricultural support policies in Turkey and the world. S.U. IIBF. J. Soc. and Econ. Res. 9:1-19.
- Aksoy, S. and O. Gaytancıoğlu. 1996. Research on the effects of increases in agricultural input prices to product prices. I. Agricultural Economics Congress of Turkey, Vol. II. Izmir, Turkey.
- Anderson, K., W. Martin and E. Valenzuela. 2006. The relative importance of global agricultural subsidies and market access. World Trad. Rev. 5:357-376.
- Anonymous. 2011a. <http://www.fao.org/FAOSTAT-Agriculture/production/crops>
- Anonymous. 2011b. <http://www.tuik.gov.tr/agriculture/database>
- DTB. 2011. Domestic support and WTO obligations in key developing countries. consulting and legal services: International Trade and Agriculture Policy. Available on line with updates at <http://www.dtbassociates.com/sitebuildercontent/sitebuilderfiles/domesticsupportstudy.pdf>, p.25.
- Erdal, G. and H. Erdal. 2008. The effects of premium payment in Turkey agricultural supports system. Gaziosmanpaşa Un. J. Agr. Fac. 25:41-51.
- Fellmann, T. 2004. Direct income payments in agricultural policies. 58th International Atlantic Economic Conference, Chicago, Illinois, USA. p.1-19.
- Cicek, A. and O. Erkan. 1996. Research and sampling methods in agricultural economics. Gaziosmanpaşa University Agricultural Faculty Publishing, 12, Tokat, Turkey. p.72.
- Gaytancıoğlu, O. 1999. Economic analysis of the agricultural politics applied on sunflower and the yield loss owing to warehousing. Trakya University Tekirdag Agricultural Faculty, Tekirdag, Turkey.
- Green, S.B., N.J. Salkind and T.M. Akey. 2000. Using SPSS for windows, analyzing and understanding data. Second Edition. Prentice-Hall Inc. Upper Saddle River. New Jersey, USA. p.243-252.
- Gunaydin, G. 2006. Agriculture sector in Turkey. J. Agr. and Eng. 76-77:12-27.
- Ilkdogan, U. 2008. Development of oilseed trade in the world and EU an evaluation in terms of Turkey: EU Expertise Thesis. Ministry of Agriculture and Rural Affairs of Turkey, Foreign Affairs and EU Coordination Department, Ankara. p.128.
- Hennessy, A.D. 1998. The production effects of agricultural income support policies under uncertainty. J. Agr. Econ. 80:46-57.
- Henningsen, A., S. Kumbhakar and G. Lien. 2009. Econometric analysis of the effects of subsidies on farm production in case of endogenous input quantities. AAEA and ACCI Joint Annual Meeting, Milwaukee, Wisconsin, USA.
- Keeny, R. 2009. Transfer efficiency and distributional impacts of U.S. farm support: evidence from a macro-micro simulation. Am. J. Agr. Econ. 91:1289-1295.
- Koc, A. 2005. Oilseed sector (seed, pulp and oil) status: Abatement of customs tariff rates and effects of premium supports. Vegetable Oils and Fats Industrialists Association, Hazar Advertising Printing, Publication No:7, Ankara. p.108.
- MFAL. 2009. Agriculture in Turkey with economical indicators. Agricultural Economics Research Institute. Project No:176, Ankara. p.41-102.
- MFAL. 2010. Costs of agricultural products in Trakya Region 1999-2010. Kırklareli Atatürk Soil and Water Resources Research Institute. Kırklareli, Turkey.
- MFAL. 2011a. Current Data of Ministry of Agriculture and Rural Affairs of Turkey. General Directorate for Agricultural Production and Development, Ankara. p.29.
- MFAL. 2011b. 2010 Annual report of Tarsim Agricultural Insurance Pool. Ministry of Agriculture and Rural Affairs and Prime Ministry Undersecretariat of Treasury and Foreign Trade, Ankara. p.7.
- Mayrand, K., S. Dionne, M. Paquin and I.P. Le Bell. 2003. The economic and environmental impacts of agricultural subsidies: An assessment of the 2002 US Farm Bill and Doha Round. Unisféra International Centre, Canada.
- OECD. 2011. Evaluation of agricultural policy reforms in Turkey. OECD Publishing. Available online with updates at <http://dx.doi.org/10.1787/9789264113220-en>
- Ozcelik, A. and H. Fidan. 2003. Importance of sunflower regarding to economy of Turkey. Turkey First Oil Seeds, Vegetable Oils and Technologies Symposium. p.92-102.
- Ozcelik, A.O. and O. Ozer. 2007. The evaluation of supporting payments to farmers for fuel and chemical fertilizer in Turkey. J. Agr. Sci. 13:1-8.

- Sahin, I., A. Semerci, Y. Kaya and N. Citak. 2010. Determining efficiency of subsidizing policies and productivity on sunflower production. MFAL TAGEM (08-R&D-6). p.354.
- Sahinoz, A., S. Cagatay and O. Teoman. 2007. Discussion of the applicability of premium support system as agricultural support in Turkey and economic analysis of the system. MFAL, Agricultural Economics Research Institute. Publ.No:155, Ankara. p.75.
- Semerci, A. and Y. Kaya. 2010. The component of production cost in sunflower and its relationships with input prices. *Int. Rev. Appl. Econ.* 5:139-146.
- Strelecek, F., R. Zdenek and J. Lososova. 2009. Comparison of agricultural subsidies in the Czech Republic and in the selected states of the European Union. *Agric. Econ. Czech.* 55: 519-533.
- TURKSTAT. 2010. Statistical indicators, 1923-2009. Turkish Statistical Institute. Publ. No:3493, Ankara. p.170.
- Yamane, T., A. Esin, M.A. Bakır, C. Aydın and E. Gürbüzsöl. 2001. Elementary sampling theory. *Literatur* Publ. No:53, Istanbul.
- Zemheri, O. 2010. Recent developments in agricultural support policies. *J. Min. Agr. and Rur. Aff.* 195:15-18.