DOI: iibfdkastamonu.382752
Submitted: 23.01.2018
Accepted: 20.10.2018

Kastamonu Üniversitesi
İktisadi ve İdari Bilimler Fakültesi Dergisi
2018, 20 (4)

Research Article

SWOT and SOR Analyses of Vegetable Seeds Sector in Antalya Province of Turkey

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Abstract: In this study, the place of vegetable seed sector in Turkey's economy and foreign trade have been highlighted, the aim of this study is to present the general structure, problems and expectations of the exporter and / or importer firms operating in vegetable seed sector in Antalya. Primary data obtained from surveys based on face-to-face interviews with 45 of the 57 seed firms operating in Antalya on vegetable seed production are the main material of the study. In the scope of the survey, data on the company structure, vegetable seed foreign trade and seed policy were compiled and the data were evaluated and interpreted by SWOT and SOR Analysis. In line with the results of the surveys and interviews conducted in this study, the necessary solutions for the opportunities and threats for the vegetable seed sector were presented. As a result of the scoring in the scope of research, the two opportunities such as incentives, grants and credit interest rates and the increasing importance of crop production as a result of increased food demand, and strategies for intense competition among many seed firms in the market have been developed.
Keywords*:* Vegetable, Seed, SWOT, SOR, foreign trade.

Antalya İli Sebze Tohumculuk Sektörünün SWOT ve SOR Analizi

Öz: Bu çalışmada sebze tohumculuk sektörünün Türkiye ekonomisi ve dış ticaretindeki yeri vurgulanmış, Antalya ili sebze tohumculuğu sektöründe faaliyet gösteren ihracatçı ve/veya ithalatçı *firmaların* genel yapısının, sorunlarının ve beklentilerinin ortaya koyulması amaçlanmıştır. Araştırmanın ana materyalini sebze tohumluğu konusunda Antalya'da faaliyet gösteren 57 tohum firmasından 45'i ile yapılan yüz yüze görüşmeye dayalı anket çalışmalarından elde edilen birincil veriler oluşturmaktadır. Anket kapsamında firmaların işletme yapısı, sebze tohumu dış ticareti, uygulanan tohumculuk politikası gibi konulardaki durumlara ait veriler derlenmiş, elde edilen veriler SWOT ve SOR Analizi ile değerlendirilip yorumlanmıştır. Bu çalışmada yapılan anketler ve gerçekleştirilen görüşmelerle ulaşılan sonuçlar doğrultusunda sebze tohumculuk sektörü için fırsatlar ve tehditlere karşı gerekli çözüm önerileri sunulmuştur. Araştırma kapsamında gerçekleştirilen puanlama sonucunda toplamda en yüksek puana sahip teşvik, hibe ve kredi faizlerindeki artışlar ve artan gıda talebi sonucunda bitkisel üretimin daha önemli hale gelmesi gibi iki fırsat ile piyasadaki çok sayıda tohum firması arasında yaşanan yoğun rekabet tehdidine yönelik stratejiler geliştirilmiştir.
Anahtar Kelimeler: Sebze, Tohumculuk, SWOT, SOR, dış ticaret.

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Atıf Künyesi: *Sav, O ve Sayın, C. (2018). SWOT and SOR analyses of vegetable seeds sector in antalya province of Turkey, Kastamonu Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 20/4, 136-145.*
Cititaion: *Sav, O ve Sayın, C. (2018). SWOT and SOR analyses of vegetable seeds sector in antalya province of Turkey, Journal of Kastamonu University Faculty of Economics and Administrative Sciences, 20/4, 136-145.*

Using certified high quality and improved seeds increases not only the productivity but also the revenue of producers in terms of domestic sales and export activities. Turkey is an important vegetable producer as it can produce vegetables in almost all regions. In terms of vegetable production in Turkey, the Mediterranean Region is the leader in greenhouse production while the Aegean and Marmara regions have the lead in open area growing. Vegetable seed production is one of the most dynamic areas within the agricultural sector for several reasons. As vegetable seeds are rich in variety, they require technical knowledge and experience. The sector has its own legislation and rules. Finally, it has high profit rates which make the private sector active and competitive players.

Before 1980, seed trade was very low in Turkey. After 1982, seed growing was encouraged and the seed industry has experienced a rapid growth. According to the International Seed Federation (ISF) 2012, the world seed market value reached 45 billion USD. With its share of 26.7%, the United States is the leader. While China is in the second place with a share of 22.1% and Turkey's share is only 1.7%.

According to the Ministry of Food, Agriculture and Livestock, Turkey’s seed exports are about half of its imports in 2015. Thus, in 2015, the seed import valued 202 million USD while export value was 103 million USD. Turkey’s vegetable seeds imports valued 115.2 million USD, which was 57% of its total seed imports. It was followed by potato seeds with 24.2 million USD (12%) and corn seeds with 12.4 million USD (6%). On the other hand, Turkey's most important seed export item was hybrid sunflower seed (24%) with 48.9 million USD. It was followed by hybrid corn seed (15%) with 30.8 million USD. As of 2016, the total number of the firms engaged in seed-related activities in Turkey was 634. Six hundred fourteen of them are native, 16 are foreign-owned and 4 domestic-foreign partnerships. Sixty-four of these companies are engaged in seed production in Antalya (TODAB, 2016).

The province of Antalya, where this research was carried out, has a very important place in vegetable and seed production activities. Thanks to its favourable climatic conditions, Antalya province is the vegetable and greenhouse centre of Turkey and the leader in the field of seed production. The total vegetable production area in Antalya province is 490,730 decares, and 56,6% of the total vegetable area is covered (greenhouses). Tomato, pepper and cucumber are the leaders among the export products of the province. The total amount of vegetable production in Turkey is 6.352.143 tons; 3.266.230 tons (51.4%) of it was realized in Antalya (TURKSTAT, 2016).

The main purpose of this research is to determine the basic strategic objectives to be followed in the seed sector. It employs the SWOT (strengths, weaknesses, opportunities, threats) and SOR (Strategic Orientation) Analyses and explores the situation of the seed sector from the viewpoint of producers, exporters and importers of vegetable seeds located in Antalya province.

1. MATERIAL AND METHOD

1.1. Material

The primary data provided by the survey of the vegetable growers operating in Antalya province constitute the main material of the study. As secondary data, we used all of the previously mentioned research results on the subject. In our study, we planned to include all of the 57 companies engaged in production, exportation and importation of vegetable seeds in Antalya province, 45 companies accepted and participated interview in the field study.

1.2. Method

SWOT Analysis is a method that is used to identify the external opportunities and threats that concern the organization in question. It demonstrates the strengths and weaknesses of the techniques, processes, structure and situation within an organisation (Table 1). In other words, SWOT analysis is an analytical technique that is used to determine and predict what the future situation of the research subject will be. In short, SWOT is an analysis of situation in future (Aktan, 1999). SWOT Analysis can be performed by using both the primary data provided by the selected target and the secondary data from the literature and the institutions. In our research, we used totally the primary data.

Based on the literature we used secondary data for the analysis of the primary survey data of this study. SWOT and SOR Analysis were used to determine internal and external effects and, strategic targets for the seed sector, respectively. In the first stage, in addition to the literature review, we interviewed with the selected companies to determine the basic issues for the SWOT analysis. Then, we created preliminary questionnaires based on Likert scale according to importance ratings. Finally, we applied the trial and final questionnaires.

Table 1. SWOT Analysis Table

	Factors	In terms of effect	
		Negative	Positive
In terms of Source	Internal factors	Weaknesses	Strengths
	External factors	Threats	Opportunities

Source: Sayın et. al. 2010.

SOR analysis is a globally used method for evaluation of production, management and performance processes (Vermeire and Gellynck 2009). SOR (Strategic Orientation) Analysis is the process of developing strategies by using the outputs of SWOT Analysis (Rajasekaran 2009). We can classify the steps of SOR Analysis as follows:

In the first stage, a SWOT analysis is made on the topic to be developed. Strengths and opportunities are given priority, and then a strategy is developed to prevent weaknesses and threats. Finally, strategies are derived to reduce threats for each opportunity and to turn possibilities into greater opportunities.

In the second stage, the Strategic Orientation Matrix (SOR) determines which strong aspect should be used for each proposed solution and which weak aspect should be reduced. After tangible targets set for each opportunity and threat, the strengths or weaknesses of the selected opportunities and threats are determined. At the final stage of the process, the strategic option that intersects with the strongest and weakest aspect is selected (Table 2).

After the interviews with the companies were completed, the threats, opportunities, strengths, weaknesses and importance ratings of the sector were determined. The companies participated in the survey rated the items in the SWOT Analysis from the least significant (0) to the most important (3). Following this stage, the SOR Matrix was created and strategies were developed concerning the opportunities and threats that received the highest points in total.

Table 2. SOR Matrix Summary

Score	What is the significance?	What can be done?
The total score is calculated for each (Strength), S (Weakness), W (Opportunity), O (Threat) T	How important is the different S,W,O,T?	Two or three strategies are developed around the most important opportunities and threats in order to maximize external factors
The score is calculated for each combination.	How will S or W meet O or T?	Strategic objectives are developed for combinations that achieve the highest scores.
Total score for each four-item group	What are the general opinions?	High S-O: Attack; high chance High S-T: Defend; we have the power to meet the threats. High W-O: Work on weaknesses to take advantage of opportunities. High W-T: Threats are heavy, it is difficult to produce solutions

Source: Vermeire ve Gellynck 2009.

2. RESEARCH FINDINGS

2.1. General Findings

As part of seed development trend, "National Seed Programs" have been adopted and launched all over the world since 1980s. As a result of global liberalization policies, many seed companies have been actively involved in seed development and trade practices in order to get a share from the world market. Technological advances in seed production and globalization trends have increased international seed trade. Involvement of several countries has led to growth and development of the seed industry. Leading seed producers and exporters countries in the world are located in the Western Europe and North America.

The sectoral development of seed industry in Turkey has been as follows: Seed Law No. 308 and ISTA membership in 1963, member of the OECD Seed Unit in 1968; liberalization of seed prices in 1982; release of seed imports in 1984, "Seed Incentive Decree" was issued in 1985; establishment of Turkish Seed Industry Association (TURK-TED) in 1986, ISF membership in 1998, and finally, increasing private sector support and research permits.

The "Law on the Protection of Breeders' Rights of New Plant Varieties No. 5042" in 2004 and the "Seed Law No. 5553" in 2006 gave priority to the private sector. This led to an increase in production capacity and encouraged organized structure; Turkish Seed Growers Association (TÜRKTOB) and sub-unions were established. Turkey's seed sector developed rapidly (Ministry of Food, Agriculture and Livestock, (GTHB) 2016).

According to ISF, in 1970, the value of world commercial seed was 10 billion USD; it reached 45 billion USD in 2012. 27% of the world seed market is in the United States, while it is 22% in China, 21% in EU countries, 6% in Brazil, 5% in Canada, 4% in India, 3% in Japan, 1.7% Turkey and 9% in other countries (ISF, 2015).

According to TURKSTAT data of 2013, Antalya province is the leader in Turkey in crop production with a value of 7.4 million TL. The share of agricultural exports in Antalya province was 44%. The share of vegetable production of Antalya was 14.1%. There are 64 seed-related establishments in Antalya, two of which are public institutions. Forty-three of them are private sector research organizations authorized by the Ministry of Food, Agriculture and Livestock (Sub-union of Seed Distributors, TODAB, 2016).

2.2. The Findings of SWOT and SOR Analyses

About sixty nine percent of the vegetable seed companies participated in the survey are jointly owned and 71.1% of them were established after 1991. Of the 45 companies interviewed, 20 are only importers, 15 are only exporters, 5 are both exporters and importers, and 5 are only producers. They mostly export and import with the EU countries.

a) Findings of SWOT Analysis

First, we carried out a SWOT analysis of the vegetable seed sector in Antalya using the primary data of research. Then we identified the sector's strongest/weakest aspects as well as the threats and opportunities in the field of vegetable seed production, export and import (Table 3).

Table 3. Findings of SWOT Analysis

No	Strengths	Frequency	No	Weaknesses	Frequency
S1	Small-scale firms in Antalya are able to adapt more quickly to changing conditions than deep-rooted companies of developed countries	15	W1	Firms do not allocate sufficient financial resources for R & D	18
S2	Agricultural production can continue year-round due to Antalya's favourable climate	12	W2	Turkish firms are not as experienced as foreign ones in terms of R&D	15
S3	Antalya is a vegetable-greenhouse center and a leading province with its seed production	8	W3	Size and capital accumulation of Turkish firms are smaller than international firms	7
S4	Domestic seed market is developing continuously due to increasing foreign trade and food demand	6	W4	Production takes place in a large variety of fields	3
S5	Seed companies have a dynamic structure closely related to the world organizations and companies.	4	W5	The private sector lacks a tradition of making joint R & D projects with the public and universities.	2
No	**Opportunities**	**Frequency**	**No**	**Threats**	**Frequency**
O1	Dynamism of the industry and increased investments in seed production	18	T1	Heavy competition due to the large number of seed companies in Turkey	14
O2	Increases in incentives, grants, loans and other supports	10	T2	High input cost	12
O3	Increase in the importance of seed foreign trade due to population increase and food demand,	9	T3	High cost of logistics	8
O4	Increasing opportunities of cooperation with national and international organizations	5	T4	Denial of seed companies as industrial enterprises	6
O5	Regulations on seed policies	3	T5	Diversity of public authorities in the seed sector	5

b) SOR Matrix Findings

In order to construct the SOR Matrix, the companies participated in the survey were asked to rate the items in the SWOT Analysis as being least significant 0 and most important 3 (Table 4).

Table 4. SOR Analysis Results

Grading		Opportunities					Threats					Total
		F1	F2	F3	F4	F5	T1	T2	T3	T4	T5	
Strong Aspects	G1	40	56	78	54	48	32	36	19	48	48	427
	G2	30	44	68	41	68	80	28	15	30	30	430
	G3	28	68	64	44	80	32	24	16	36	36	413
	G4	20	60	44	32	64	32	24	27	26	26	355
	G5	26	44	30	36	12	52	52	27	44	44	367
Weak Aspects	Z1	32	44	34	61	16	40	44	48	26	26	421
	Z2	28	20	32	31	16	56	40	46	60	60	369
	Z3	28	24	56	30	24	36	32	51	17	44	342
	Z4	76	32	12	24	40	48	76	40	44	52	444
	Z5	52	56	20	54	56	44	52	52	65	51	502
Scoring		360	448	438	407	424	452	408	341	396	417	4091

Strategies have been developed around the three opportunities that make up the highest total score in the resulting scoring. F2 shows increases in incentives, grants, loans and other support. F3, on the other hand, refers to the increase in demand and production of vegetable food due to population growth. Another strategy is the intense competition due to the large number of seed companies in Turkey, which is the highest scored threat (T1).

Strategic Goal 1: There are two strengths. A) Small-scale firms in Antalya can adapt more rapidly to changing conditions according to well-established firms in developed countries (G1: 78); B) Because of its favourable climate, agricultural production can be maintained in Antalya throughout the year (G2: 68). Joint research projects with private sector public and universities can be realized and new seed varieties can be developed by using these advantages, (Z3: 56). Increasing population and rising food demand have multiplied the importance of seed trade, which is an opportunity that should not be missed (F3: 438).

Strategic Goal 2: There are two strengths that should be used. A) Antalya is the leader in seed production and it is the centre of vegetable-greenhouse sector (G3: 68). B) Domestic seed market is growing continuously due to increasing foreign demand and trade (G4: 60). Capital accumulation of firms is insufficient and company scales are small (Z5: 56). These issues can be addressed by sectoral incentives, grants, loans and other support opportunities (F2: 448).

Strategic Goal 3: Due to its favourable climate, agricultural production can be maintained in Antalya throughout the year (G2: 80). Turkish firms have dynamic structure and they are in close contact with world organizations and other companies (G5: 52). However, Turkish firms have little experience in R&D (Z2: 56); and there is intense competition due to the large number of seed companies in Turkey (T1: 452). The advantages above can be used to reduce the adverse effects of the disadvantages.

CONCLUSION

The seed sector, which forms the backbone of the vegetable sector in Turkey, has undergone rapid transformation over the last three decades. Policies followed by both the government and private sector have led to rapid development of seed production, and foreign trade has developed considerably. In our study, we suggest some solutions to the problems emerged in the SOR Analysis whose findings are based on the SWOT Analysis.

Firms should use their advantages and strong aspects to address the following weaknesses. a) Despite the growing importance of the seed sector in the world, seed producers in Antalya do not allocate sufficient financial resources to seed development, b) Compared to old and well-established foreign seed companies, seed producers of Antalya are not experienced enough in R&D; c) finally, Turkish firms have lower capital accumulation and their scales are much smaller than their foreign competitors.

Thanks to its favourable climate, Antalya is the centre of vegetable-greenhouses and has global relations. In view of these aspects, the competent public institutions in the seed sector must be united under one roof. Private/public sector and universities should receive support for implementation of joint research projects. In addition, logistics and input costs should be reduced in the sector.

In order to rise the share of Antalya province in the competitive international vegetable seed markets, first of all, legal regulations should be made. Next adequate and strong sectoral structure should be established. Moreover, breeding infrastructure and seed production systems should be modernized. Seed is a strategic product and seed production is a highly specialized process. For this reason, in addition to measures concerning production and foreign trade, longterm policies need to be developed in terms of labour, inputs and taxes (Sav, 2014).

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