Tarım Ekonomisi Dergisi
Turkish Journal of Agricultural Economics
ISSN 1303-0183
http://journal.tarekoder.org

# Alienation of Agricultural Fertilizer and Pesticide Suppliers: A Case Study in Adana*

Burak ÖZTORNACI[1], Dicle AYAZ[1]

*A part of this research was presented in the 3rd International Congress on Social and Economic Sciences (ICSES), 15-19 November 2017, Athens, Greece.

[1]Cukurova University, Faculty of Agriculture, Department of Agricultural Economics, Adana

***Makale Künyesi***

***Araştırma Makalesi / Research Article***

***Sorumlu Yazar / Corresponding Author***
*Burak ÖZTORNACI*
*burakoztornaci@gmail.com*

*Geliş Tarihi / Received: 23.11.2017*
*Kabul Tarihi / Accepted: 26.06.2018*

*Tarım Ekonomisi Dergisi*
*Cilt:24 Sayı:1 Sayfa:1-10*
*Turkish Journal of Agricultural Economics*
*Volume: 24 Issue: 1 Page: 1-10*

DOI 10.24181/tarekoder.449948

***Abstract***

'Green Revolution', a production form based on heavy use of chemicals, hybrid seeds, agricultural machinery and intensive irrigation has become widespread almost all around the world. It is claimed to have increased food production and solved the problem of starvation, but today is under debate because of its harmfull effects on environment and human health. The related literature has focused specifically on manufacturers and users of agricultural chemicals. However, there is an intermediate retailer ring, mostly agricultural engineers, where agricultural producers obtain their inputs and get information and advice on agricultural production. For this reason, in terms of public health and food safety, it is important to determine the retailers' level of sensitivity to environment and human health. The present study focused on the agricultural input retailers in the city of Adana, which is one of the most important basins in Turkey. Totally, 513 agricultural input retailers are located in Adana. In study, approximately 10% of these agricultural input retailers (50 retailers) were interviewed using face to face questionnaires. The study investigated their sensitivity to the environment and human health and also focused on the concept of alienation. Data obtained were evaluated using SPSS software and employing Chi-square independence tests. The study shows that, regardless of the level of education and income, the agricultural input retailers acknowledge that the products they market are harmful to the environment and human health but prefer to ignore this issue on account of financial and technical concerns.
**Key words:** Agricultural Input Retailers, Alienation, Turkey, Adana

***Zirai Gübre ve İlaç Tedarikçilerinde Yabancılaşma: Adana İli Örneği***

***Özet***

"Yeşil Devrim" olarak adlandırılan, gıda üretiminde kimyasal gübre ve ilaçların yoğun kullanıldığı, hibrid tohumlara, ağır tarımsal makinalara ve yoğun sulamaya dayalı üretim şekli, günümüzde hemen hemen bütün dünyaya yayılmış durumdadır. Gıda üretimini önemli düzeyde arttırdığı, dünyadaki açlık sorununu çözdüğü iddia edilen "Yeşil Devrim", çevreye ve insan sağlığına verdiği zararlar nedeniyle bugün artık tartışma konusudur. Bu konudaki bilimsel literatür tarım kimyasalları üreten firmalar ile bu kimyasalları kullanan üreticiler özelinde yoğunlaşmıştır. Ancak bu zincirde bir ara halka olarak zirai bayiler de mevcuttur. Çoğunluğu Ziraat Mühendisi olan bu bayiler, üreticilerin tarımsal girdileri tedarik ettikleri, tarımsal üretime dair her türlü konuda bilgi aldıkları, danıştıkları birer işletmedirler. Bu nedenle halk sağlığı ve gıda güvenliği açısından, üreticiler kadar zirai bayilerin de çevre ve insan sağlığına duyarlılık düzeylerinin tespit edilmesi önemlidir. Bu araştırmada Türkiye'nin en önemli tarım havzalarından biri olan Adana ilindeki zirai bayilerin, çevre ve insan sağlığına duyarlılıkları, yabancılaşma kavramı temel alınarak incelenmiştir. Araştırma alanı olan Adana ilinde toplam 513 zirai bayi bulunmaktadır. Araştırma kapsamında bu zirai bayilerin yaklaşık %10'u (50 bayi) ile yüz yüze anket metodu vasıtasıyla görüşülmüştür. Elde edilen veriler SPSS programı kullanılarak değerlendirilmiş ve Khi-kare bağımsızlık testi uygulanmıştır. Araştırma sonucunda zirai bayilerin, eğitim ve gelir seviyesi fark etmeksizin, satışını gerçekleştirdikleri ürünlerin çevreye ve insan sağlığına zararlı olduğunu düşündükleri ancak iktisadi ve teknik kaygılardan dolayı bu olguyu göz ardı etmeyi tercih ettikleri anlaşılmıştır.
**Anahtar kelimeler:** Zirai Bayiler, Yabancılaşma, Türkiye, Adana

## 1.INTRODUCTION

Agriculture is thought to have begun in the region known as 'Fertile Crescent', including the southern parts of Turkey, about 10 thousand years ago (Madeley, 2002). The beginning of agriculture is called 'The First Agriculture Revolution' The reason for this is that the agricultural production undergoing change as of 1950 is named as 'The Second Agriculture Revolution' or 'Green Revolution (Bayram et al., 2007).

Within the first revolution, agricultural production was performed in a form of integrated animal and plant production which contained hunting and gathering and in which various plants were grown (Tümertekin and Özgüç, 2009). However, 'Green Revolution', which started following the Second World War particularly through the investigations in developed countries, almost totally changed this agricultural production preceding it. Together with Green Revolution, local seeds were replaced by hybrid seeds and heavy agricultural tools and machinery using fossil fuels were included in the production process. To meet the increasing food demand and improve efficiency in production, pesticides and fertilizers were introduced into the process of

agricultural production (Ploeg, 2011; Engdahl, 2009; Foster, 2013).

This radical change which took place in agricultural production during mid-twenties had two major consequences. The first one was that while the producers almost arbitrarily met the demand for their products from the nature through traditional means, following the Green Revolution, they were transformed to petty commodity producers who had access to market goods appropriate for market conditions through input they obtained from the market itself. Throughout this period, the process of agricultural production was divided into sections depending on the needs of the market, and in each section, productivity and profitability became the target goals. This disintegration process which initially started with the separation of plant production and animal production was followed by factory, laboratory and similar production facilities. As a natural consequence of this type of production, the producers not only lost their voice over their products and seeds but also became dependent on companies in procuring the chemical fertilizers and pesticides. During this period, the production of almost all agricultural inputs, from seeds to machinery and from fertilizers to pesticides was taken over by companies and even multi-national companies. Özden (2017) stated that by the year 2014, 7 companies controlled 71% of total world seed market and 6 companies controlled 75% of the world pesticide market. 5 of these companies were in the group which controlled both the seed and pesticide sector. Similarly, by the year 2013, 41% of the chemical fertilizer market was dominated by 10 companies (Anonymous, 2013). A similar situation is observed in agricultural products. Gimenez and Shuttuck (2011) stated through their research that about 80% of the world cereal production was controlled by the big companies Bunge, ADM and Cargill.

The second consequence caused by the Green Revolution is whether the agricultural production which could be seen as guiding a natural process has become an activity which today harms the environment and human health or not. The pesticides started to be used together with the Green Revolution so as to fight against diseases and pests caused various problems. Apart from their stated goals, these pesticides caused negative consequences on human health, on the natural environment they were applied, and even on the ecosystems far away from these natural environments (Kahn, 1991). For instance, DDT, a chemical used in the USA in the 1950s, was found to have affected the penguins in Antarctica. Of the most widely used 700 pesticides today, 33 were evaluated as "very harmful on human health" by the World Health Organization (WHO), 48 as "dangerous", 118 as "intermediate dangerous", and 239 as "a little dangerous" (WHO, 1999, Burnett, 1990, Karaer and Gürlük, 2003). Similar problems were observed in the use of chemical fertilizers. In this new type of agricultural production which focused on improving productivity, the production and use of inorganic fertilizers was focused on in order to increase growth and efficiency in plants. Particularly, nitrogen fertilizers obtained from chemical industry began to be heavily used. As a consequence, these chemical fertilizers increased the level of dissolved nitrogen in rivers, lakes and seas and had adverse effects on the living organisms in these ecosystems (Munasinghe, 1993).

Numerous scientific studies are present on the dangers of this type of agricultural production which is dominant today. However, one of the issues that needs to be investigated is how such a kind of agricultural production is still dominant and widespread when there is more than enough data on its dangers and the findings are so popular. For example, Özalp and Güldal (2017) observed through their study that corn producers knew about the dangers of the chemical fertilizers and pesticides but continued using these products heavily. How could the products whose dangers on the nature and on human health are debated still be produced? The answer to this question is described through the term "alienation" in the related literature (Ollman, 2008; Aydoğan, 2015).

The concept of alienation in the related literature was first put forward by Hegel (Tolan, 1981; Yapıcı, 2004). The concept of alienation which has been investigated and defined in various ways up to the present time could briefly be described as the destruction of human's natural, social, psychological and cultural aspects (Yılmaz and Sarpkaya, 2009). This concept of alienation which has begun to have a richer literature can be summed under five headings. These are the alienation of the human to his own labor, to his own product, to the nature, to himself and to the other humans, namely his own kind (Özden, 2017).

The studies investigating the problem of alienation and depersonalization which could be regarded as the starting point of alienation within the context of agricultural production have mostly focused on producers specifically (Olhan, 1997; Yılmaz et. al., 2009; Akbaba, 2010; Ertürk et. al., 2012; Özden, 2017; Özalp and Güldal, 2017). However, the form of agricultural production which became dominant with the Green Revolution is a chain consisting of three rings: companies producing agricultural chemicals and other inputs, retailers who sell these products (agricultural input retailers) and producers. Producers are the last ring of the chain, and generally with the lowest level of income and education. This study particularly focused on the alienation of the intermediate ring, namely the agricultural input retailers, most of whom are university graduates. In this respect, the opinions of the suppliers of agricultural inputs about the products they market, their effects on the nature and human health and their sensitivity were investigated within the context of the present study. The city of Adana, one of the most important agricultural fields in Turkey, was chosen as the study area.

## 2.MATERIAL and METHOD

### 2.1.Material

The main material of the study consists of the primary data obtained from questionnaires conducted on agricultural input retailers marketing agricultural inputs. Questionnaire forms complying with the purpose of the study were used in the face-to-face

interviews with the retailers. Such questions as the social and economic characteristics of these retailers, their opinions on the effects of the products they market, and their opinions on other related ecological issues were included in the questionnaires

The study covered the year 2017 and the data were collected between June and August, 2017. The study was also supported by national and international findings and statistics.

### 2.2.Method

#### 2.2.1.Sampling

According to data obtained from Adana Provincial Agriculture Directorate under the Turkish Republic Ministry of Food, Agriculture and Livestock, by the year 2017, there are 508 agricultural pesticide retailers and 360 fertilizer retailers in the city of Adana. However, 355 of these retailers market both agricultural pesticides and fertilizers. In other words, there are a total of 513 agricultural input retailers in the city of Adana. 50 of these agricultural input retailers, amounting to 10% of them, were interviewed within the context of the study.

#### 2.2.2.Data Analysis

The primary data collected through questionnaires were analyzed with SPSS 22.0 software program. Definitive statistics and Chi-Square independence test were applied as the analyses. Chi-Square independence test is a statistical test applied to solve the research question whether two random categorical variables are independent of each other. The significance value for the Chi-Square test was determined as 0.05. The education variable used in the Chi-Square is the last school the interviewed retailer graduated from. Another variable used in the Chi-Square test, "the number of the customers the retailers do business on a regular basis", was used in place of the "income" variable used in other studies in the related literature (Özalp and Güldal, 2017). The reason for this is that none of the retailers interviewed consented to give information about their average monthly income. Therefore, in order to find out the size of the companies, it was decided to use the number of the customers they regularly do business with.

## 3.FINDINGS

The age range of the owners of the companies interviewed in the context of the study was as follows: 26% between the ages of 20 and 34, 46% between 35 and 49 and 14% between 50 and 65. Furthermore, 12% of the owners of these companies are high school graduates and 88% are university graduates. 90% of the university graduates are agriculture engineers, while the other 10% consist of graduates of management, economics, and chemical engineering. The sectoral experience of the owners of these companies is 17.7 years. In terms of professional organization, about 64% of them are members of Chamber of Agriculture Engineers and 72% are members of Adana Chamber of Commerce.

In 50 of the companies interviewed in the study, a total of 76 agriculture engineers and 144 workers were working, which equals to an average of 1.5 agriculture engineers and 2.9 workers per company. None of the companies consented to share information about their level of income, but gave information about the number of the customers they do business with on a regular basis. For this reason, the size of the companies was determined based on the number of the regular customers. It was determined that 30% of the companies did regular business with 0-50 customers, 48% with 51-150, and 22% with 151-600 customers. All of the companies marketed both agricultural pesticides and fertilizers.

All of the companies interviewed in the study sell chemical fertilizers. 62% of them sell both chemical and organic fertilizers. 47% of the companies who sell organic fertilizers stated that they sold them to obtain profit, 9% of them for their effect on human health and 44% of them for their benefit on the environment. 44% of those who do not sell organic fertilizers stated that they had a low profit margin, while 56% of them thought that organic fertilizers were useless.

**Table 1.** The Opinions of the Companies about the Chemical Fertilizers They Market (%)

| Factors | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **I can consume the products grown with chemical fertilizers with my own children in my house** | 10 | 6 | 0 | 16 | 68 | 100 | 84 |
| **I can persuade the people around me to eat the products grown with chemical fertilizers** | 10 | 6 | 0 | 16 | 68 | 100 | 84 |
| **The chemical fertilizers I market harm the soil after a while and make it infertile** | 6 | 10 | 8 | 14 | 62 | 100 | 76 |
| **The chemical fertilizers I market harm the beneficial organisms in the soil** | 22 | 4 | 4 | 24 | 46 | 100 | 70 |
| **The chemical fertilizers I market pollute underground waters, lakes seas, and rivers** | 4 | 8 | 6 | 18 | 64 | 100 | 82 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.697*

The opinions of the agriculture retailers about the chemical fertilizers they market and about the agricultural products these fertilizers are used were investigated. As shown in Table 1, 84% of the agriculture retailers consume the products grown with the chemical fertilizers they market in their homes and with their relatives. 76% of them think that the chemical fertilizers they market cause the soil to become infertile, 70% think that they harm the beneficial organisms in soil, and 82% think that they have an adverse effect on sources of underground and surface water. On the other hand, when these retailers were asked what effect they thought these chemical fertilizers had on human health, 48% stated that they had harmful effects, while 52% said that they had no effect. None of the agriculture retailers interviewed think that chemical fertilizers are beneficial to human health.

**Table 2.** The Reasons Why the Agriculture Retailers Choose the Products They Market (%)

| Factors | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **I expect the chemical fertilizers I market to be cheap** | 30 | 12 | 8 | 26 | 24 | 100 | 50 |
| **I pay attention to the rarity of the chemical fertilizers I market** | 20 | 32 | 30 | 18 | 0 | 100 | 18 |
| **I take into consideration whether the chemical fertilizers I sellleave any residue in soil** | 22 | 20 | 36 | 8 | 14 | 100 | 22 |
| **I choose the chemical fertilizers based on their positive effects on the environment** | 14 | 38 | 34 | 6 | 8 | 100 | 14 |
| **I care about the potential (efficiency) of the chemical fertilizers I market** | 14 | 0 | 20 | 12 | 54 | 100 | 66 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.710*

The reasons why the retailers choose the brand and type of fertilizers they market were investigated. As shown in Table 2, 50% of these retailers stated that they choose the chemical fertilizers they market taking into account the low cost, 18% their rarity in the market, 22% the residue they leave in soil, 14% their positive effect on the environment and 66% their efficiency.

**Table 3.** The Relationship between the Opinions of the Retailers about the Effects of the Products Grown with Chemical Fertilizers on Human Health and Their Education Level

| The Education Level of the Retailers | How do you think the products grown with the chemical fertilizersyou market affect human health? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Beneficial | | No effect | | Harmful | | Total | |
| | n | % | n | % | n | % | n | % |
| **High School** | 0 | 0 | 3 | 50 | 3 | 50 | 6 | 100 |
| **University** | 0 | 0 | 23 | 52.3 | 21 | 547.7 | 44 | 100 |
| **$X^2$=0.11 < $X_{table}$ =7.814 P value=0.917 df=1 No relationship** | | | | | | | | |

The relationship between the opinions of the retailers about the effects of the products grown with the chemical fertilizers they market on human health and their education level and the customers they do business with on a regular basis was investigated. As shown in Table 3 and Table 4, no significant relationship was identified between these parameters based on the Chi-Square test conducted.

**Table 4.** The Relationship between the Opinions of the Retailers about the Effects of the Products Grown with Chemical Fertilizers on Human Health and the Number of the Customers They Do Business on A Regular Basis

| The number of the customers the retailers do business on a regular basis | How do you think the products grown with the chemical fertilizers you market affect human health? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Beneficial | | No effect | | Harmful | | Total | |
| | n | % | n | % | n | % | n | % |
| **<51** | 0 | 0 | 9 | 60 | 6 | 40 | 15 | 100 |
| **51-150** | 0 | 0 | 12 | 50 | 12 | 50 | 24 | 100 |
| **150>** | 0 | 0 | 5 | 45.5 | 6 | 54.5 | 11 | 100 |
| **$X^2$=0.612 < $X_{table}$ =7.814 P value=0.736 df=2 No relationship** | | | | | | | | |

All of the companies interviewed market pesticides. The opinions of the retailers about biological control which could be thought to be an alternative to chemical struggle against pests and diseases in plant production in particular were investigated. 60% of the retailers do not regard biological control as an effective method.

**Table 5.** The Opinions of the Retailers about the Chemical Pesticides They Market (%)

| Factors | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **I can consume the products grown with chemical fertilizers with my own children in my house** | 12 | 8 | 0 | 20 | 60 | 100 | 80 |
| **I can persuade the people around me to eat the products grown with chemical fertilizers** | 12 | 8 | 0 | 20 | 60 | 100 | 80 |
| **The chemical fertilizers I market harm the soil after a while and make it infertile** | 14 | 12 | 6 | 26 | 42 | 100 | 68 |
| **The chemical fertilizers I market harm the beneficial organisms in the soil** | 4 | 4 | 4 | 22 | 66 | 100 | 88 |
| **The chemical fertilizers I market pollute underground waters, lakes seas, and rivers** | 4 | 14 | 0 | 26 | 56 | 100 | 82 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.0701*

The opinions of the agriculture retailers about the pesticides they market and about the products grown with these pesticides were evaluated. As shown in Table 5, 80% of them consume the products grown with the pesticides they market with their families and their relatives. 68% of them think that the pesticides they market cause soil to become infertile, 88% think they harm the beneficial organisms in soil, and 82% think they have an adverse effect on underground and ground water supplies. However, when asked about the effects of the pesticides they market on human health, 74% stated that they had harmful effects, while 26% said they had no effect. None of the retailers interviewed think that pesticides are beneficial to human health.

**Table 6.** The Reasons Why the Agriculture Retailers Choose the Chemical Pesticides They Market (%)

| | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **I expect the pesticides I market to be cheap** | 22 | 28 | 8 | 10 | 32 | 100 | 42 |
| **I pay attention to the rarity of the chemicalpesticides I market** | 0 | 16 | 32 | 32 | 20 | 100 | 52 |
| **I take into consideration whether the pesticides I sell leave any residue in soil** | 8 | 14 | 32 | 22 | 24 | 100 | 46 |
| **I choose the pesticides based on their positive effects on the environment** | 10 | 34 | 10 | 34 | 12 | 100 | 46 |
| **I care about the potential (efficiency) of the pesticides I market** | 12 | 4 | 18 | 6 | 60 | 100 | 66 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.709*

The reasons why the retailers choose the brands and types of the pesticides they market were investigated. As shown in Table 6, 42% of these retailers stated that they choose the pesticides they market taking into account the low cost, 52% their rarity in the market, 46% the residue they leave in soil, 46% their positive effect on the environment and 66% their efficiency.

**Table 7.** The Relationship between the Opinions of the Retailers about the Effects of the Products Grown with Pesticides on Human Health and Their Education Level

| The Education Level of the Retailers | How do you think the products grown with the pesticides you sell affect human health? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Beneficial | | No effect | | Harmful | | Total | |
| | n | % | n | % | n | % | n | % |
| **High School** | 0 | 0 | 2 | 33.3 | 4 | 66.7 | 6 | 100 |
| **University** | 0 | 0 | 11 | 25 | 33 | 75 | 44 | 100 |
| **$X^2$=0.191 < $X_{table}$ =7.814 P value=0.662 df=1 No relationship** | | | | | | | | |

The relationship between the opinions of the retailers about the effects of the products grown with the pesticides they market on human health and their education level and the customers they do business with on a regular basis was investigated. As shown in Table 7 and Table 8, no significant relationship was identified between these parameters based on the Chi-Square test conducted.

**Table 8.** The Relationship between the Opinions of the Retailers about the Effects of the Products Grown with Pesticides on Human Health and the Number of the Customers They Do Business on A Regular Basis

| The number of the customers the retailers do business on a regular basis | How do you think the products grown with thepesticides you sell affect human health? | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Beneficial | | No effect | | Harmful | | Total | |
| | n | % | n | % | n | % | n | % |
| <51 | 0 | 0 | 5 | 33.3 | 10 | 66.7 | 15 | 100 |
| 51-150 | 0 | 0 | 4 | 16.7 | 20 | 83.3 | 24 | 100 |
| 150> | 0 | 0 | 4 | 36.4 | 7 | 63.6 | 11 | 100 |
| $X^2=2.120 < X_{table} =7.814$ P value=0.346 df=2 No relationship | | | | | | | | |

The level of awareness and opinions of the retailers interviewed in the study about such methods as organic agriculture, which is thought to be more beneficial to the environment and human health, and good agricultural practices were investigated. It was observed as a result of the interview questions that 60% of the retailers lacked or had wrong knowledge about organic agriculture and good agricultural practices. 80% of the retailer interviewed think that organic agriculture could not be sustainable, while 50% regard good agricultural practices as unsustainable and unpromising. 81% of those who think that organic agriculture is not sustainable put forward economic reasons, while 19% think the reason lies behind consumers' mistrust owing to a lack of supervision. 73% of those who think that good agricultural practices are not sustainable put forward economic reasons, while 23% think the reason lies behind consumers' mistrust owing to a lack of supervision.

**Table 9.** The Opinions of the Retailers about the Relationship between Chemical Fertilizers and Pesticides and Diseases (%)

| Factors | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **I think the chemical fertilizers andpesticides that are marketed cause genetic diseases** | 22 | 6 | 12 | 14 | 46 | 100 | 60 |
| **I think the chemical fertilizers andpesticides that are marketed cause cancer cases** | 8 | 2 | 4 | 16 | 70 | 100 | 86 |
| **I think the chemical fertilizers andpesticides that are marketed cause defected births and dead births** | 16 | 4 | 18 | 18 | 44 | 100 | 62 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.693*

The opinions of the retailers about the relationship between chemicals used in agricultural production and diseases were investigated. As shown in Table 9, 60% of the retailers think these chemicals cause genetic diseases, 86% think they cause cancer cases, and 62% think they cause defected and dead births.

50% of the retailers interviewed in the study stated that they do not want their own children to do business in the agricultural input supplying sector part of which they themselves are. All of the retailers who do not want their children to work in this sector stated that they hold such a decision owing to the economic problems inherent in the sector.

Within the context of the study, the opinions of the agriculture retailers about the economic structure of the agricultural input sector were also investigated. It was found out that 54% of the retailers had bank loans. 56% of those who had bank loans said that they used the loans for operating expenses. In addition, 52% of the retailers said that they take into consideration whether the products they market are domestic or of foreign origin, and all of those who care about this distinction stressed that they find the foreign-origin products better quality.

**Table 10.** The Opinions of the Retailers about the Sector (%)

| Factors | 1 | 2 | 3 | 4 | 5 | Total | 4+5 |
|---|---|---|---|---|---|---|---|
| **The prices of pesticides and fertilizers are not determined by the market but by the decisions made among theproducing companies** | 18 | 16 | 14 | 14 | 38 | 100 | 52 |
| **Bank loans make us dependent** | 6 | 0 | 16 | 22 | 56 | 100 | 78 |
| **Under the present market circumstances, the working conditions of the engineers in the companies is extremely compelling** | 16 | 10 | 14 | 12 | 48 | 100 | 60 |

*1) Totally disagree, 2) Disagree, 3) Indecisive, 4) Agree, 5) Totally agree*
*Cronbach's Alfa: 0.730*

The opinions of the retailers interviewed in the study about the sector were also investigated. As shown in Table 10, 52% of the retailers think that the prices of products are not determined by the free market mechanisms but by unanimous decision of the producing companies. Moreover, 78% of the retailers stated that bank loans make them dependent on the banks and 60% said the working conditions of the engineers working in these companies are extremely compelling.

The agriculture retailers interviewed also stressed that they did not take back the empty bottles or packages of the agricultural products they market and that such a recycling mechanism is not present in the sector.

## 4.DISCUSSION

An analysis of the results of the study reveal that there are some controversies between the answers the agriculture input suppliers gave to the interview questions. Most of these retailers, 80% of whom are agriculture engineers and 88% of them are university graduates in total, stated that the chemical fertilizers and pesticides they market have harmful effects on human health. However, the same retailers see nothing wrong in consuming the products grown with these chemicals with their family members and friends. A similar situation is observed over the effects of these chemicals on the environment. Almost all of the retailers interviewed think that these chemicals harm the nature and some of the organisms in nature. But, they choose the products they market based on their efficiency. On the other hand, it is obvious that the chemical fertilizers and pesticides with an increased efficiency will also have an increased harmful effect on the environment. It is likely that the retailers' controversial responses to interview questions are owing to economic and security concerns. However, the concept of alienation caused by the dominant type of agricultural production should not be ignored, either. The retailers interviewed have undoubtedly gained knowledge about the adverse effects of agricultural chemicals throughout their education and in their daily life. However, the economic activity that they have to pursue to make a living forces them to disregard this knowledge.

There is one of Turkey's largest and oldest agriculture faculties in Adana, chosen as the study area for the present study. An analysis of the curriculum of agricultural engineering of this faculty indicated that students have to pass about 70-75 subjects. Only about 3-5 of these subjects are on ecology and professional ethics. The other subjects were found out to have been planned to increase efficiency and productivity in agricultural production. Taking into account the fact that most of the agriculture retailers interviewed in the study are agriculture engineers, it is highly probability that they choose the products they market based on their efficiency is a result of the education they receive.

## 3.RESULT and SUGGESTIONS

There has been common consensus that the products grown with the form of agricultural production starting with the Green Revolution and has proliferated almost all over the world are harmful to the nature and humans. Particularly the agents who take part in the food production process, regardless of level of education and income, think that the present method of production is harmful to the nature and humans. The present study which was conducted on the agriculture retailers who are the intermediate ring within agricultural production reveals that this dominant production method bears controversies in itself and at the same time leads to controversies and dilemmas in all the agents involved in it. As a result of all of these controversies, those who take part in this production process become indifferent to and alienated from the nature and society in order to make a living. It is obvious that this a naturel consequence of this type of agricultural production. Hence, it seems unlikely that such controversies will be removed as long as this type of agricultural production is present.

The prevalent belief in the present literature that sensitivity to the environment and human health could be increased with the help of education must be questioned. This study revealed that both the educated and less educated people taking part in this type of agricultural production display similar behaviors. As a consequence, it is highly probable that the key to discarding these controversies is within the framework of the changes to be put into effect in the present type of agricultural production. For the solution of the present and similar problems, an agricultural production based on the historical benefits of humans is essential.

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# Zirai Gübre ve İlaç Tedarikçilerinde Yabancılaşma: Adana İli Örneği

Burak ÖZTORNACI, Dicle AYAZ

## GENİŞLETİLMİŞ ÖZET

Tarımın günümüzden yaklaşık 10 bin yıl önce, Türkiye'nin güney kesimlerini de kapsayan, "Verimli Hilal" olarak adlandırılan bölgede başladığı düşünülmektedir. Tarımın başlangıcına "1. Tarım Devrimi" denilmektedir. Bunun temel nedeni, 1950 yıllardan itibaren değişen tarımsal üretime "2. Tarım Devrimi" veya "Yeşil Devrim" denilmesidir.

Birinci tarım devrimi ile tarımsal üretim, avcılık ve toplayıcılık faaliyetleri ile birlikte yapılan, farklı bitkilerin bir arada yetiştiği, bitkisel üretim ile hayvansal üretimin iç içe olduğu bir tarzda gerçekleşmekteydi. İkinci Dünya Savaşı sonrasında, özellikle gelişmiş ülkelerdeki araştırmalar doğrultusunda başlayan "Yeşil Devrim" ise kendisinden önceki bu tarımsal üretim şeklini neredeyse tamamen değiştirmiştir. Yeşil Devrim ile birlikte yerel tohumların yerini melez (hibrit) tohumlar almış, fosil yakıtların yoğun olarak kullanıldığı ağır tarımsal alet ve makinalar üretim sürecine dahil olmuştur. Artan gıda ihtiyacını karşılamak ve üretimde verimliği arttırmak için tarımsal üretim sürecinde kimyasal ilaç ve gübrelerde yerini almıştır.

Yirminci yüzyılın ortalarında tarımsal üretimde yaşanan bu köklü değişimin iki temel sonucu olmuştur. Birincisi, daha önce üreticiler nispeten özgürce karar verdikleri üretimleri için gerekli girdileri doğadan, geleneksel yollarla karşılarken, yeşil devrim sonrasında piyasa koşullarına uygun ürünleri yine piyasadan elde ettikleri girdiler ile gerçekleştiren, küçük meta üreticilerine (petty commodity producer) dönüşmüşlerdir. Bu girdilerin (tohumdan makineye, gübreden ilaca) üretimi ise şirketlerin hatta günümüzde çok uluslu şirketlerin (ÇUŞ) egemenliğine geçmiştir.

Yeşil devrimin yarattığı değişimin ikinci sonucu ise doğal bir süreci yönlendirmek olarak değerlendirilebilecek olan tarımsal üretimin, bugün artık doğaya ve insana zarar veren bir faaliyet olup olmadığının tartışılır olmasıdır. Yeşil devrim ile birlikte hastalık ve zararlılara karşı mücadele için kullanılmaya başlanan kimyasal ilaçlar pek çok soruna neden olmuştur. Bu ilaçlar amaçları dışında insan sağlığında, uygulandıkları doğal ortamlarda ve bu doğal ortamların çok uzağındaki ekosistemlerde bile olumsuz etkilere yol açmışlardır.

Günümüzde hakim olan bu tarımsal üretim tarzının zararları hakkında pek çok bilimsel çalışma mevcuttur. Ancak asıl incelenmesi gereken konulardan birisi, zararları hakkında araştırmalar bulunan ve bu araştırma bulgularının oldukça popüler olduğu bir dönemde, bu üretim tarzının nasıl hala hakim ve yaygın olduğudur. Doğaya ve insana zararlı olduğu tartışılan ürünler nasıl hala üretilmektedir? Literatürde bu sorunun cevabı "yabancılaşma" kavramı ile açıklanmaktadır. yabancılaşma olgusu, kısaca, insanın doğal, toplumsal, psikolojik ve kültürel boyutlarının parçalanması olarak tanımlanabilir. Son iki yüz yıldır zenginleşen bir literatüre sahip olan yabancılaşma olgusu beş başlık altında toplanabilir. Bunlar insanın kendi emeğine, emek ürününe, doğaya, kendine ve diğer insanlara yani kendi türüne yabancılaşmasıdır.

Bu çalışma kapsamında tarımsal girdi tedarikçilerinin, doğaya ve insanlara yabancılaşması incelenmiştir. Bu kapsamda tarımsal girdi tedarikçilerinin satışını gerçekleştirdikleri ürünlere ve bu ürünlerin doğaya ve insan sağlığına etkileri hakkındaki görüşleri ve duyarlılıkları araştırılmıştır. Araştırma alanı olarak Türkiye'nin en önemli tarım havzalarından biri olan Adana ili seçilmiştir. Araştırma ana materyalini Adana'da ticari olarak tarımsal girdi satışı yapan bayilerle yapılan anket çalışmalarından elde edilen birincil veriler oluşturmaktadır. Bayilerle yüz yüze görüşmelerde, araştırma amacına uygun olarak hazırlanmış anket formları kullanılmıştır. Anket formlarında, işletmecilerin sosyal ve ekonomik özellikleri, satışını gerçekleştirdikleri ürünlerin etkilerine dair görüşleri, ilgili diğer ekolojik konulardaki görüşleri vb. sorulara yer verilmiştir. Çalışma 2017 yılını kapsamakta olup, veriler Haziran-Ağustos 2017 tarihleri arasında toplanmıştır. Adana ilinde toplam 513 zirai bayi bulunmaktadır. Araştırma kapsamında bu tarımsal girdi tedarikçilerinin yaklaşık %10'una tekabül eden 50 tanesi ile görüşülmüştür. Anket yoluyla toplanan birincil verilerle tanımlayıcı istatistikler ve Khi-kare bağımsızlık testi gerçekleştirilmiştir.

Araştırma kapsamında görüşülen işletme sahiplerinin %46'sı 35-49 yaş aralığında, %88'i üniversite mezunu, üniversite mezunu olan işletmecilerin %90'ı Ziraat Mühendisidir. Araştırma kapsamında görüşülen işletmecilerin %84'ü kendi sattıkları kimyasal gübreler ile yetiştirilen ürünleri, aileleri ve yakınları ile tüketmektedirler. İşletmecilerin %70'i topraktaki yararlı canlılara zarar verdiğinin ve %82'si ise yeraltı ve yerüstü su kaynaklarına zarar verdiklerini düşünmektedirler. Ancak işletmecilere sattıkları kimyasal gübrelerin insan sağlığına nasıl bir etkisi olduğunu düşündükleri sorulduğunda, işletmecilerin %48'i zararlı etkileri olduğunu söylemiştir. Benzer bir şekilde işletmecilerin %80'i kendi sattıkları kimyasal ilaçlar ile yetiştirilen ürünleri, aileleri ve yakınları ile tüketmektedirler. İşletmecilerin %68'i sattıkları kimyasal ilaçların toprağı verimsizleştirdiğini, %88'i topraktaki yararlı canlılara zarar verdiğinin ve %82'si ise yeraltı ve yerüstü su kaynaklarına zarar verdiklerini düşünmektedirler. Ancak işletmecilere sattıkları kimyasal ilaçların insan sağlığına nasıl bir etkisi olduğunu düşündükleri sorulduğunda, işletmecilerin %74'ü zararlı etkileri olduğunu söylemiştir.

İşletmecilerin sattıkları kimyasal gübreler ve ilaçlar ile üretilen ürünlerin insan sağlığına etkisi hakkındaki görüşleri ile eğitim durumları ve düzenli satış yaptıkları müşteri sayısı arasındaki ilişki incelenmiştir. Yapılan Khi-kare testinde, bu

parametreler arasında anlamlı bir ilişki tespit edilememiştir.

Bu durum göstermektedir ki, zirai girdi tedarikçileri gerek eğitimleri sırasında gerekse günlük hayatlarında tarım kimyasallarının negatif etkilerine dair çeşitli bilgiler edinmişlerdir. Ancak kendi yaşamlarını idame ettirdikleri ekonomik faaliyet sırasında bu bilgileri göz ardı etmektedirler. Ne eğitim, ne de gelir düzeylerinin yüksekliği, tarım kimyasallarının negatif etkilerini göz önünde bulundurmalarına neden olmaktadır.

Tarımsal üretim sürecinde ara halka konumundaki zirai bayiler ile yapılan bu çalışma göstermektedir ki, bu hâkim üretim yöntemi kendi içinde çelişkiler barındırdığı gibi içinde yer alan aktörlere de pek çok çelişki ve açmaz yüklemektedir. Bütün bu çelişkilerin sonucu olarak bu üretim sürecinde yer alanlar, kendi hayatlarını idame ettirebilmek için, içinde yaşadıkları doğaya ve topluma duyarsızlaşmakta ve yabancılaşmaktadırlar. Bu durumun, bu tarımsal üretim yönteminin tabiatı gereği olduğu aşikârdır. Dolayısıyla bu üretim tarzı var olduğu sürece bu çelişkilerin ortadan kaldırılması olası görünmemektedir.

Mevcut literatürde hâkim anlayış olan eğitim yardımıyla çevre ve insan sağlığına dair duyarlılığın geliştirilebileceği görüşü sorgulanmalıdır. Bu araştırma göstermiştir ki, bu üretim tarzında yer alan eğitimli insanlar da, daha az eğitimli insanlar ile benzer davranışları sergilemektedirler. Sonuç olarak bu çelişkilerin aşılması için aranacak olan çözüm yolunun, mevcut tarımsal üretim tarzında gerçekleşecek değişiklikler çerçevesinde olma olasılığı yüksektir. Bu ve benzeri sorunların çözümü için insanlığın tarihsel çıkarlarının temel alındığı bir tarımsal üretim gereklidir.