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**IMPORTANCE OF SUSTAINABLE AGRICULTURAL MANAGEMENT**

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**ABSTRACT**

Agriculture is an important economic activity for many people. Agriculture, on the one hand, constitutes the main source of the production of food, which is a condition for the survival of the people, and on the other hand it provides the people with a source of livelihood. Again, agriculture is being done in the environment we live in and these activities are affecting the environment due to various pressures such as the ever-increasing population, more income, more products from the unit area, and this effect is increasingly threatening human health. Because of these characteristics, agriculture is indispensable for people and it is a strategic production sector. For this reason, management of agricultural activities is of great importance. The importance of agriculture in our lives is increasing day by day and social consciousness about agriculture is developing rapidly. Thanks to technological developments, people can get information faster and easier and they are conscious about agricultural activities. People no longer prefer products derived from agricultural activities that are harmful to the environment and human health when questioning the safety of products produced after agricultural activities. Thanks to this auto control, producers are adapting their production processes to the new situation in line with these expectations. In this new process, sustainable agricultural production methods such as organic farming, good farming practices and ecological farming have emerged in order to maximize the benefits of preserving their production capabilities without damaging the resources at hand, taking into consideration the rights of future generations in agricultural production. These new approaches require the fulfilment of management function scientifically in order to achieve the goals that are aimed at sustainable agriculture.

**Keywords:** Sustainable Agriculture, Organic Agriculture, Good Agriculture, Management, Environment.

**INTRODUCTION**

The world that we live in is equipped with sources that will meet our needs. Briefly, these resources what we call as nature are finite, in other words scarce and they can renew themselves and can ensure their continuity within a certain order. This happens until some ruin it. Nature, which has been able to preserve its characteristics to renew itself for a long time, has begun to lose this ability rapidly with the changes took place on the nature especially as a result of the developments industrial revolution brought about. People who came to realize this have turned to seek new ways to protect the nature. As a result of these pursuits sustainability concept has emerged. This concepts takes into consideration the future generations in the use of scarce resources in nature and reflects the aim of benefitting from these sources by protecting their

ability to meet our demands and other words their ability to renew themselves. This concept is used as a guide in all activities people carry out in order to maintain their lives. Sustainable agriculture concept has also emerged in the agricultural activities that bear a vital importance and are carried out in touch with nature or dependent on the nature tightly.

Sustainable agriculture means protection of the natural resources in the long-run and formation of an agricultural structure where environment-friendly agricultural technologies are used. As in the developed countries of the world, agriculture is gaining totally industrial characteristics in Turkey. Synthetic production inputs are not used in an uncontrolled manner; however, a very intense agricultural production takes place without considering consequences of negative processing technics and technologies. Today, these practices result in the upset of the natural balance and pose dangers primarily to the living things in the ecosystem and to the humans by means of food chain. The situation in the agricultural practices have begun to be as striking as industrial or urban pollutions. Within the scope of sustainable agriculture understanding, organic agricultural techniques that meet the standards aimed at the protection of health and environment play a key role in the protection of water and soil by various practices such as integrated pesticides management and by avoiding the usage of non-organic inputs such as pesticides, synthetic fertilizers. This study aims to emphasize the organic agriculture and the practices carried out in this issue, which we believe are of importance for the sustainable agriculture in the world and in our country by presenting the sustainable agriculture, the principles of sustainable agriculture and the developments in this field.

## **2. Sustainable Agriculture and Basic Principles**

Sustainable agriculture is the formation, development, and application of the agricultural production techniques that will enable the natural resources to function lastingly. It ensures that natural resources are protected in the agricultural practices in the long run to satisfy our nutrition need, which is a vital requirement. The need for sustainable agriculture results from the fact that it becomes impossible to reverse the damages we inflict upon the nature with the production methods used in order to satisfy our needs just like any other human activity areas. Likewise, we had to be aware that we headed for a fall with the natural disasters, environmental pollution and accordingly health problems that arise as a result of the negative changes we have caused in the nature inconsiderately in order to create the civilization we have today. This awareness tells us that we have destroyed the nature but poses the question of where we will maintain our lives.

Sustainable agriculture concept is an approach which aims to balance the agronomical, environmental, social and economic dimensions in the agriculture. It seeks to keep the economy alive and aims to enhance the quality of life of those engaged in agricultural activities both in the short and long term by planning the needs of the future generations and also by preserving the agricultural productivity and minimising the harm done to the environment. Future-oriented plans must be definitely carried out for a sustainable life and attention should be paid to the fact that these plans do not decrease the life standards of people and do not restrict the personal freedoms. Use of natural resources is a must for a sustainable agriculture. Otherwise, as a result

of the practices done excessively and without thinking about the future for a certain period of time, it will be inevitable for people to face difficulties in the long term. For this reason, primarily, the aims on this topic must be determined and presented very clearly. Also, the agricultural activities which are not sustainable should not be supported. Governments and various organizations must take precautions against the practices that can harm the environment. For instance, efficient training and control precautions must be taken against the excessive irrigation, fertilization and wrong pesticide application. In this respect, a database must be created for a sustainable agriculture and necessary technical, social and economic data banks must be created and opportunities must be provided to access them easily.

The problems that nature faces due to the human activities should be handled in a way that encompasses the socioeconomic studies. For example, it can be said that the destruction of the rain forests in Southern America results from the poverty experienced in that region. Poverty that people suffer from should be a problem for us and also other the people in other countries. This is because the destruction of the rain forests will affect not only the people in a certain region but also the whole world and therefore all people. For this reason, development and environmental protection plans should always be designed at a regional and global dimension. In the world, it becomes more and more difficult to enlarge the agricultural lands and water resources. Environmental impacts such as soil erosion and air pollution have also slowed down the growth of the agricultural land in the world and even brought it to a halt. That the soil which suffered from intense erosion cannot be cultivated and even more, arable lands are used for purposes other than agriculture such as buildings and factories leads to loss of agricultural lands worth million hectares. Some countries like Brazil, Israel form new agricultural lands by improving the soils which are insufficiently productive, other countries such as Turkey and China transform their 1st class agricultural lands into different areas of use. Consequently, a downward trend is observed in the agricultural land per person both in our country and in the world (Rehber & Çetin, 1999). While the world population grows at one hand, the decrease in the cultivated areas manifests itself as an important problem on the other hand.

Developed and developing countries tried to exert efforts to take precautions against all these threats about the future and initiated studies in 1950s. In sustainable agricultural practices, notably biological management, alternative methods to chemical management and integrated management systems are included. Integrated management is a sustainable strategy which takes into consideration human health, environment and natural balance. It is also called as Integrated Pest Management (IPM) or Integrated Pest Control (IPC) and is expressed shortly as “Management System of the Pests” (Crucefix, 1998). Integrated management is a pest management system that keeps the population of the pests below the economic loss level by taking into consideration the population dynamics of the pests and their relationship with the environment and by using the appropriate management systems and techniques conformably. It aims to enhance plant production, obtain high quality and pesticide-free products, protect and support natural pests, control the fields, gardens and yards periodically, help the farmers become the experts of their own fields, gardens or yards, and prevent the pesticides from being transmitted to the environment (soil, water and air). Integrated management stipulates the

management of disease, pesticide and weeds present in a certain agricultural ecosystem be carried out together; not separately and appropriate management methods and techniques be integrated in a complementary way (Atış, 2004). Apart from these, a great many sustainable agricultural practices are present.

When the sustainable agriculture concept is assessed in terms of our country, the important topics include erosion, overuse of inputs, environmental pollution, irrigation, industrialization, urbanization and impacts arising out of the tourism, the upset and steady -decline of pasture and meadows. In approximately 80% of the soils in our country moderate level of or highly severe erosion is seen and it is at a level which can affect the agricultural sustainability (Günaydın, 2005). Agricultural practices, particularly soil cultivation methods and techniques destroy the vegetation and lead to erosion. The main reason for this is that the investments made with the aim of protecting and improving the soil fall so short and soil protective precautions are not applied. The prevalence of small scale agricultural enterprises and the low level of agricultural income constitute a significant reason for this. Similarly, it became evident that conducting sustainable agricultural activities is important in areas where agriculture has been done intensively in our country. Chemical fertilizers, which are used at high rates but without applying appropriate fertilizing techniques contaminate the soil. Similarly, management pesticides which are overused and contain substances that should be avoided result in the emergence of significant negative impacts on the natural environment. Particularly, use of highly nitrogenous and phosphoric fertilizers affect the physical and chemical characteristics of the soils and therefore leads to contamination. Likewise, organic substance accumulation becomes harder and the productivity decreases in the soil as a result of the change of micro flora in the soil due to the use of pesticides. Considering the experiences of some countries, there is the risk of natural ambient change in agricultural lands because of the genetically modified (GMO) seeds. In light of these, enhancing the agricultural productivity and fertility and ensuring the food safety along with creating a “sustainable agricultural sector” and preventing the upset of the natural environment emerge as important aims. Achieving a structure in line with the principles of sustainable agriculture and making relevant policies manifest themselves as important aims so as to ensure that growing and urbanizing population are adequately and nourished in a balanced way production and export are increased by giving weight to the relatively superior products and income of the producers is increased and stability is achieved. At this point, use of more environmentally friendly products and production technologies, preserving the natural resource stock and enlarging the organic agriculture become important. Especially, producers and consumers in many countries, particularly in countries with high income per capita, grow more conscious and become organized and have begun to prefer producing agricultural products which do not pose harm to the humans by means of the techniques that do not destroy the nature. Organic agriculture, a production method that pursues this goal, has begun to be used in our country like other countries and substantial steps have been taken in this regard nowadays.

### **3. Reflection of the Agricultural Sustainability Understanding: Organic Agriculture**

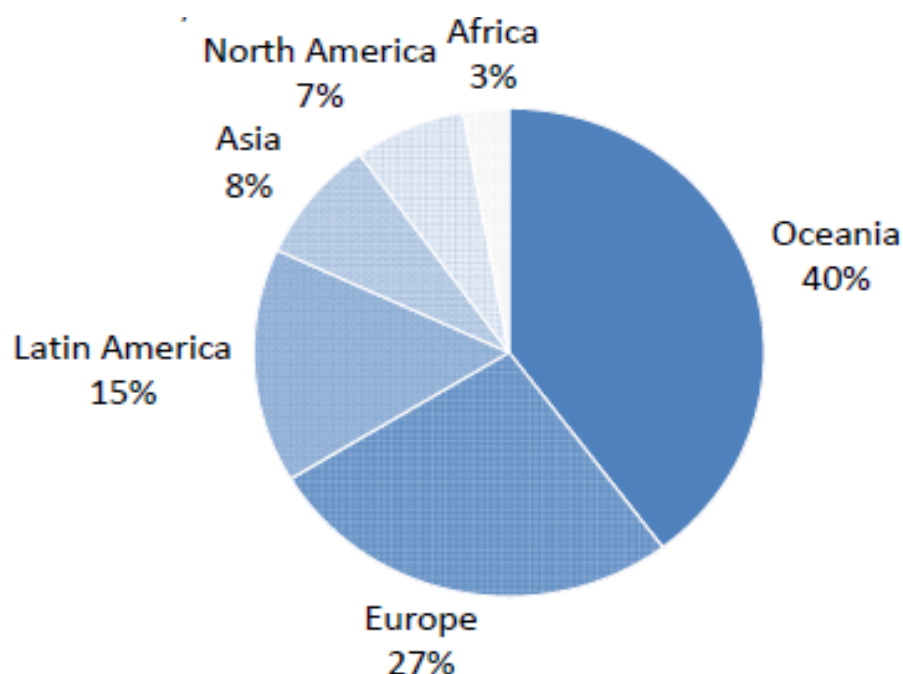
Organic agriculture (Ecological, Biological) is an agricultural system which was developed in line with the sustainability understanding in agricultural activities as an alternative against the adverse impacts created on human health, economy and environment by the industrial agriculture which depends on the high input use. In the organic agriculture system which aims to preserve the natural balance disturbed as a result of the mal-practices based on the optimal usage of the resources, the use of synthetic fertilizers, pesticides and hormones which are detrimental to the natural balance is prohibited. The fundamental principles of the system are set as soil fertility, selection of the appropriate species in the protection from the diseases and pesticides, crop rotation, recycling of the vegetative wastes, green manure application, use of organic wastes and animal manure and biological management. Organic agriculture aims to achieve high quality. The main goal is to ensure the production optimization among soil-plants-animals and humans in a healthy way. All national and international standards about organic agriculture necessitate the control and certification of all the steps that the products go through from the production to the consumption. The certification provides assurance to the consumers who aim to lead a healthy life and protect the environment by consuming organic products. Besides, it allows the organic agriculture producers to document and prove the production conforming to the standards and market their products at a value that they are worthy of.

Organic agriculture is a system which designs animal and vegetative production as a whole, increases the efficiency with an understanding that does not disturb the soil structure, takes the animal welfare as a basis, aims to use the inputs provided from within the enterprise, requires inspection and documentation within the scope of certain rules from the seed to the soil, from the input to the enterprise by making use of cutting edge information and technologies. Organic agriculture is a sustainable ecosystem, a fairness for the all living things, is a way of life with the social justice and human relations understanding.

The studies conducted demonstrate that ensuring the flow of information in technical and financial issues is a must in order to achieve efficiency and quality in organic production and especially close contact with the producers in the transition process will yield fruitful results. Identifying and handling the priorities for all producers in all regions individually will increase the success.

While organic agriculture system has enlarged all around the world, it has particularly grown in European countries after 1990s and more rapidly in countries such as Australia, Germany, Luxemburg and Switzerland. The factors effective in the transition to this agricultural system and success of it can be listed as financial opportunities offered to the producers, fast flow of information, wide spectrum of products, national symbols, protection and planning. A questionnaire implemented in Germany and England indicated that the reasons why consumers preferred organic products are 1. The importance attached to the personal health and children's health (Germany 70%, England 46%), 2. Environment (Germany 10-30%, England 41%) 3. Taste (Germany 13-24%, England 40%) 4. Animal rights and health (England 26%) (Aksoy et al., 2002).

Agriculture is done in 37.2 million-hectare area in the world. The biggest portion of this is in Australia with a 12.02 million-hectare organic production area. 97% of this area is constituted by the organic certified vast pasture areas where cattle breeding for meat production takes place. Argentina is placed 2nd with an area of 3.8 million ha. Across continents, Oceania comes 1st with a 12.2 million-hectare area and is followed by Europe with 11.6 million-hectare area according to organic agriculture lands. In Europe, natural collection is done in an area of 13.4 million ha. While the organic agriculture land in Africa is 1.1 million ha, natural collection is done in an area of 11.9 million ha (Willer & Lernoud, 2016). When the total distribution of organic agricultural lands across continents is examined, it is seen that Oceania comes first with a share of 33%. It is followed by Europe with a share of 29% and Latin America with 18%, respectively (Figure 1).



**Figure 1. Regional distribution of organic farming areas (Willer and Lernoud, 2016).**

Majority of the developing countries have some advantages in organic agricultural production. Primarily, climate advantages and the presence of conventional production systems in the developing countries, and secondly usage of less chemical substances and that soil fertilization is applied in a way more suitable to the organic agriculture help these countries adapt the organic production in an easier manner (Rehber & Turhan, 2001). Assessed in terms of our country, organic product manufacturing which started with the production of the ranges of products demanded by the external markets at the desired amounts gained a new dimension in 2000s. New products are released into the organic agriculture markets and the efforts to generate demand get



intensified as in the traditional products. While organic agriculture was done in an area of 203.811 ha in 2005 in our country, this figure rose to 523.778 ha in 2016. Also, a similar increase has been achieved in the number of the manufacturers and it is seen that the number of the manufacturers, which was 205 in 2005, increased to 225 in 2016 and the production amount reached to 2.473.600 tons (Anonymous, 2017) (Table 1).

**Table 1. Organic Agriculture Plant Production (Transition Period Included)**

Years	Number of Products	Number of Farmers	Farming Field (ha)	Natural Collection Field (ha)	Total Production Alanı(ha)	Production Amount (ton)
2005	205	14.401	93.134	110.677	203.811	421.934
2006	203	14.256	100.275	92.514	192.789	458.095
2007	201	16.276	124.263	50.020	174.283	568.128
2008	247	14.926	109.387	57.496	166.883	530.224
2009	212	35.565	325.831	175.810	501.641	983.715
2010	216	42.097	383.782	126.251	510.033	1.343.737
2011	225	42.460	442.581	172.037	614.618	1.659.543
2012	204	54.635	523.627	179.282	702.909	1.750.126
2013	213	60.797	461.395	307.619	769.014	1.620.466
2014	208	71.472	491.977	350.239	842.216	1.642.235
2015	197	69.967	486.069	29.199	515.268	1.829.291
2016	225	67.878	489.671	34.106	523.778	2.473.600

## CONCLUSION

Sustainability has been described as an ability that can be preserved indefinitely without serious adverse impacts by meeting the basic social needs. Likewise, development of a sustainable agricultural production system requires defining the basic social needs that arise out of the agriculture. This process requires having a collective vision about what should be the characteristics of the agriculture in the future. In order for an agricultural system to be sustainable, it is necessary to benefit from the resources effectively and realize the four goals of

sustainability. Therefore, it is necessary that agricultural systems are sufficiently productive and sound. In our world which stepped into a new century, concerns about future are experienced in a more intense way. The rapidly growing world population and that a great many studies are carried out regarding the future raises the question of if we will be able to produce enough food substances to feed this many people in the future. Results of many studies indicate that with the intense agricultural production programs implemented we approached the threshold of an unsustainable development. As a consequence, the necessity for enhancing the agricultural production without damaging the nature arises from now on. In order to make it true, it is necessary to develop sustainable agricultural techniques that minimize the erosion, soil salinity, water resources contamination and other harms. It is seen that while both developed and developing countries seek the ways to enhance the food production, it is a must to develop new methods that will secure the natural resources used in the agriculture. Particularly, the wrong and high-input cultivation techniques result in the microorganism losses that cannot be brought back to the agricultural lands. It is also observed that agricultural management pesticides used for many years have not been taken under control. This application must be taken under control because of the dangers they pose to the human health and threats to the other species and increase in the resistance to the agricultural management pesticides. In case that precautions are not taken as a requirement of a sustainable life in the world and in our country, the number of people suffering from starvation will increase and even will reach to an alarming rate. In our world which is confronted with these problems, organic agriculture system that does not create dangers in terms of natural resources for production is an approach which is able to realize the sustainable agricultural production with respect to human, environment and economy. Organic agriculture aims to ensure that natural resources are protected and developed and environment is protected and food quality and health requirements are satisfied and it is seen as a method suitable for the sustainable agriculture. In the developed European countries, research and applied studies on organic agriculture have intensified recently with the growing environmental awareness. In the future, especially governmental policies will accelerate this transition and conscious consumers will demand the products cultivated in natural conditions and accordingly contribution will be made to this issue. In the evaluations performed regarding the use of input in developing countries such as our country, it is seen that the use of chemical fertilizers and crop protection pesticides is lower than the developed European countries and this is seen as an advantage in the transition to the organic agriculture.

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