

THE REASONS OF RAPID TRANSFORMATION PROCESS IN AGRICULTURE OF TURKEY

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Dear Participants,

I would like to give my pleasure to being in brother and friend country Uzbekistan and to see positive developments in agriculture of Uzbekistan, and so I salute respectfully you all.

Turkey has 46 billion tonnes/year of horticulture (fruits and vegetables) production and 93,3 billion tonnes/year of field crops in 4 billion hectare of open field and 60.000 hectare of protected area so it is one of the world's major producer countries with its 139 billion tonnes crop production.

The rapid developments in the Turkish economy in recent years, Turkey has been brought to the state of the world 16th largest economy. According to World Bank data, Turkey is the world 16th largest economy with its gross domestic product (GDP), besides agricultural gross national product has seem (AGNP) is more affirmative. Agricultural gross national product with three-times increase has reached from 24 billion dollars to 62,5 billion dollars in the last 10 years. While Turkey was 11th place in 2002, it has been 7th place in 2012 in agricultural gross national product in the world order; as well as in Europe, Turkey has increased to 1st place through very important country for the agricultural economy like France, Italy, Spain, Russia. Turkey is closely located to continent-sized territory of countries such as China, India, USA, Indonesia and Brazil. Besides Turkey's government policy this rapid rise of Turkey has been through to increase its share of scientific research and the use of modern techniques in agriculture.

Turkey is the 1st rank in seven crops (nuts, apricot, fig, cherry, sour cherry, quince and poppy seeds), 2nd rank in six crops (watermelon, melon, strawberry, leek, honey and vetch), and 3rd rank in eight crops (lentil, apple, cucumber, green pepper, fresh bean, chestnut, pistachio and sheep's milk) in FAO list. In this state, Turkey is the third productive country for some crops after China and India. USA follows Turkey. More than 700 species are produced and thousands of agricultural products are exported in our country. According to international standards; Turkey is one of the most important agricultural countries in the world in terms of agricultural economics and agricultural production.

Table 1. Turkish Agriculture in World Ranking

Rank	GDP (2011)		Sıra	Agricultural GNP (2012)	
	Country	(Billion \$)		Country	(Billion \$)
1	<u>USA</u>	15,075,675	1	CHINA	515,8
2	<u>China</u>	11,299,987	2	INDIA	211,2
3	<u>Japan</u>	4,444,139	3	USA	165,0
4	<u>India</u>	4,420,563	4	INDONESIA	82,6
5	<u>Germany</u>	3,113,927	5	BRAZİL	82,1
6	<u>Russia</u>	2,383,364	6	JAPAN	71,3
7	<u>Brazil</u>	2,294,178	7	TURKEY	62,5
8	Great Britain	2,287,865	Increase in Agricultural GNP		
9	<u>France</u>	2,213,780	In 2002		11.
10	<u>Italy</u>	1,846,922	In 2009		8.
11	<u>Mexico</u>	1,666,531	In 2012		7.
12	<u>South Korea</u>	1,554,124			
13	<u>Spain</u>	1,405,787			
14	<u>Canada</u>	1,395,374			
15	<u>Indonesia</u>	1,124,631			
16	<u>Turkey</u>	1,075,467			

The Present Situation of Turkey Horticultural Sector

Turkey with a total of 124,847 million tons of crop production fruit and vegetable production constitutes 33% (Table 2).

Turkey's total crop production is 124 847 million tons and fruit and vegetable production constitutes 33% of this amount(Table 2). Turkey is a fruit and vegetable paradise. Turkey is among the most important countries in the world with its fruit, vegetable and ornamental crops growing and production. In the 1950s, 452 000 tonnes of fruit production increase to 2,5 billion tonnes in 1970s,

to 7 billion tonnes in 1986, to 11 billion tonnes in 1994, to 13,5 billion tonnes in 2000, to 18,4 billion tonnes in 2011 (737% increase in 41 years from 1970-2011). Turkey is one of the most important five countries in the world production of many fruits and vegetables. 27.5 million tons of vegetables are produced per year in Turkey. Turkey meets 12% of melons, 11% watermelon, %14 beans, %10 peppers, %9 eggplant, % 8 tomatoes produced in the world.

Turkey has a history of over 50 years greenhouse but with a very rapid development of greenhouses it has become an important sector both production and in terms of exports. Turkey has 422.000 da greenhouse areas in 2000, but it has reached to 467.000 da in 2005 and 600.000 da in 2011. Our current greenhouse situation has consisted of 39,8% plastic greenhouses, 29,2% lower plastic tunnel, 17,8% higher plastic tunnel, 13% glasshouses. In this state, Turkey still is one of the world's major greenhouse manufacturers.

In 2000, production area of ornamental plants was 15.132 da but it has reached to 39.300 da in 2005 and 92.900 da in 2011. As of 2011, there was approximately 76 billion US \$ exports and 68 billion US \$ imports. Turkey is largely self-sufficient in terms of horticulture (excluding tropical and exotic fruits and vegetables). Turkey is an exporter country in the horticultural industry with this feature. An employment provided to about 5 million crowds of people in the vegetables and ornamental plants industry.

The Subject of R&D Project in Horticulture Research

Projects on collection, characterization, protection and sustainable utilization of horticulture genetic resources

Producing and registration of new varieties of fruits, vineyard, vegetable and ornamental plants by using classic (selection, hybridizing and mutation) and molecular breeding methods

Determination of regional performance of registered varieties

Improving and adoption of advanced breeding techniques

Studies for the development of organic farming

Projects for the implementation of advanced harvest and post-harvest technologies in the country conditions

Business socio-economics, cost and profitability analysis in horticulture

Table 2. The production amount of Horticulture in plant production

	Crop plants	Fruits	Vegetables	Total
2000	66.482	14.227	24.638	105.348
2005	75.461	15.983	26.472	117.916
2006	77.176	16.186	25.852	119.214
2007	70.286	15.556	25.661	111.503
2008	74.383	16.782	27.218	118.383
2009	80.368	17.725	26.780	124, 874
2010	90.580	17.915	25.997	134.492

2011	93.303	18.426	27.547	139.276
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Source: <http://www.tuik.gov.tr>

Some Significant Results Obtained by Horticulture Researches in Recent Years

Vegetables

Both 157 standard varieties and 50 hybrid varieties have been developed by our research institutes. To achieve this goal, The Project of “Development of Turkey F1 Hybrid Vegetable Varieties and The Cooperation of Public-Private Sector in Seed Production” was initiated in 2004. The main theme of this project was; to produce qualified genitors of 8 vegetable species (tomato, pepper, eggplant, cucumber, watermelon, melon, zucchini, cabbage) and to use them in breeding together with private sector. 5 Research Institute of the Ministry, 7 universities and 36 private seed companies featured in this project. The rate of utilization of F1 domestic vegetable seeds was 10% in 2004, increased to 50% in 2013 through the project.

Important Outcomes Obtained From the Project

- The number of breeder was increased and an organized breeding group of 30 people have been constituted in public research institutes and private sectors.
- The amount of gene pool of the institutes has increased approximately 10-fold.
- The first hybrids of cucumber, melon and pepper was produced in a little while and registered.

Ornamentals

Besides the researches and studies of GDAR on the cultivation of natural ornamentals, the project of “The Cultivation of Some Natural Herbs and Earning to New Species and Varieties to Ornamentals Sector” initiated in 2006 by funding TUBITAK. 7 Research Institute of the Ministry, 7 universities and 13 private ornamental plants companies featured in this project.

Up to now, almost every region of the Flora of Turkey have been searched and 40% of the 750 endemic species (such as Colchicum, Fritillaries, Hyacinthus, Iris, Lilium, Nectaroscordum, Paeonia, Polygonatum, Tulipa) have been collected from 4100 different location. The collected material has been protected in Yalova, Turkey.

Breeding studies has been started from selected wild-type through mutation and crossbreeding and produced new varieties in these endemic species. Firstly, 3 new varieties (Alev Topu, Eful, Tombak) of Paeonia was produced and registered.

Further The Turkey’s Geophytes Garden has been started to establish in Yalova, Atatürk Horticultural Central Research Institute and is scheduled to open in 2014. It will be the largest garden of the temperate climate of the world in terms of hosting number of species and will also be the first in our country.

Fruits-vineyards

892 pieces of fruit / vineyard varieties and 199 pieces of rootstocks has registered until present. In recent year, studies on the development of new varieties by selection, hybridization and mutation

breeding have rise up in our Institutes whereupon new fruit / vineyard varieties which are more and more involved in production have been registered.

Fruit Genetic Resources

9306 pieces of fruit samples (variety, clone and type) in 60 temperate fruits and 2132 pieces of vineyard samples are protected in 16 gene garden within our Research Institute. The studies of collection, protection, characterization, propagation and utilization of our fruit genetic resources still continue. Besides 964 pieces of citrus and its relatives types are characterized, registered and protected in Alata Horticultural Research Station, West Mediterranean Agricultural Research Institute, Aegean Agricultural Research Institute and Çukurova University.

Studies on Development of Kiwi Production

The Study on development of kiwi production was launched in 1988 by Yalova Atatürk Central Horticultural Research Institute. The positive results have been obtained from the study and at present kiwi production have developed rapidly in Marmara and Black Sea regions. Today, up to 40 000 tonnes of kiwi fruit production will increase rapidly in the near future.

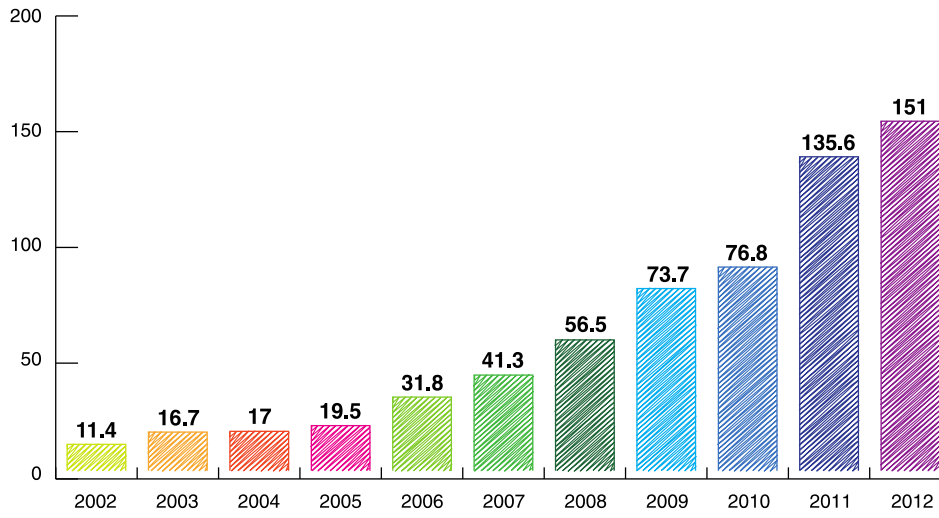
THE FUTURE OF HORTICULTURAL RESEARCHES

2023 Objectives of Turkish Agricultural Research

Worthy of quality to global and regional power Turkey, generating to international solutions for agricultural problems, implementing national and international level R & D projects, improving technology for \$ 40 billion of agricultural product exports, a highly prestigious "Agricultural Research Organization" is aimed. The budget of R & D projects of GDAR is given in Figure 1. According to this, the R & D budget has increased 13-fold in the last decade from 2002 until 2012. Staff costs are not included in these figures.

Table 5 shows that sharing budget for research and development studies by some countries. In the last decade Turkey has increased to allocate for the budget R & D activities at four-fold, even though it is far behind the developed countries. Countries plays a vital role in the world in accordance with produce knowledge, developed the technology and innovation. Therefore, Turkey has to do R & D activities in order to compete with world countries, develop and use their own technology instead of importing, not live independence to develop countries and to ensure the food safety.

Figure 1. The capacity of R & D budget (billion TL, Turkish Liras)



Source: Ministry of Food Agriculture and Livestock, General Directorate of Agricultural Research and Policy, R&D studies of the Ministry, Department of Training, Extension and Publishing, 2nd Edition, 2013.

Table 5. GDP Ratio of R & D Expenditures in some of the countries

Country	Ratio %
USA	2.88
EU	1.90
China	1.70
Japan	3.33
South Korea	3.36
Russia	1.24
Switzerland	3.62
Turkey	0.86
Israel	4.28
Germany	2.78
France	2.21
Britain	1.85

Source: OECD, Main Science and Technology Indicators, 2013

Developed countries allocate to approximately 2% of Gross Domestic Product (GDP) from their budget for R & D expenditure. R & D target of Turkey for 2023 adopted by the Council of Science and Technology is among the top 15 countries in world ranking and is to raise the share of 3% R & D in GDP.

2023 Vision in Agriculture

According to 2023 Vision in Agriculture, Turkey intend to be a country which feeding the population of 85 million with sufficient, high-quality and reliable food production, improving its exporter situation, increasing competitiveness and having a voice in the world and its region (Anonymous 2013c). Accordingly, it is intended to be a country that has \$ 40 billion Exports of Agricultural Products, \$ 150 billion in Gross Agricultural Output and sited between the world's top 5 countries for Turkey.

Foresights about the future of Turkish agriculture stand out in the following headings:

Quality standards and food security in agriculture will be important. For this reason, capacity and quality of enterprise will increase while reducing its number.

Through the planned arrangements the competitiveness of products will increase in foreign markets.

Especially fresh fruits and vegetables will gain importance.

Organized farming zones will be created.

The contracted production and organic farming will come to the forefront.

Government support for R & D investments will increase.

The majority of investors will turn to high-tech agricultural activities.

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