

Fruit Growing in Romania and Its Role for Rural Communities' Development

Maria Toader, Gheorghe Valentin Roman

Abstract—The importance of fruit trees and bushes growing for Romania is due the concordance that exists between the different ecological conditions in natural basins, and the requirements of different species and varieties. There are, in Romania, natural areas dedicated to the main trees species: plum, apple, pear, cherry, sour cherry, finding optimal conditions for harnessing the potential of fruitfulness, making fruit quality both in terms of ratio commercial, and content in active principles. The share of fruits crops in the world economy of agricultural production is due primarily to the role of fruits in nourishment for human, and in the prevention and combating of diseases, in increasing the national income of cultivator countries and to improve comfort for human life. For Romania, the perspectives of the sector are positive, and are due to European funding opportunities, which provide farmers a specialized program that meets the needs of development and modernization of fruit growing industry, cultivation technology and equipment, organization and grouping of producers, creating storage facilities, conditioning, marketing and the joint use of fresh fruit. This paper shows the evolution of fruit growing, in Romania compared to other states. The document presents the current situation of the main tree species both in terms of surface but also of the productions and the role that this activity may have for the development of rural communities.

Keywords—Fruit growing, fruits trees, productivity, rural development.

I. INTRODUCTION

FRUIT production is of particular importance in terms of food and for phototherapy. Fruit trees and shrubs are one of the healthiest foods indispensable in making an optimal food diet for the human body. They contain 2-25% carbohydrates in the form of easily assimilated sugars (sucrose, glucose, fructose), 0.5-1.5% proteins, 0.5% organic acids, 0.4 to 1.6% pectins, 0.1% tannins, 0.5% minerals, based on K, Ca, Mn, Fe, Al, S, P, Si, Cl, B, 80-85% water, 0.8-1% cellulose, 0.1 to 0.7% fat, vitamins, amino acids [1].

Fresh fruits are one of the indispensable components of rational human nutrition. Nutritional value of fruit fresh consumption is due to the chemical components thereof, easily accessible body, plus a number of excitatory gustatory, olfactory and visual, which are to be enjoyed with pleasure at any time of day or season.

Maria Toader is with the University of Agronomic Sciences and Veterinary Medicine Bucharest, Faculty of Agriculture, Department of Crops Sciences, Bldv. Marasti, 59, sector 1, Bucharest, Romania (corresponding author, phone: +40 (21) 318 22 66, fax: +40 (21) 318 28 88, e-mail: mirelatoadervali@yahoo.com).

Gheorghe Valentin Roman is with the University of Agronomic Sciences and Veterinary Medicine Bucharest, Faculty of Agriculture, Department of Crops Sciences, Bldv. Marasti, 59, sector 1, Bucharest, Romania (e-mail: romangv@yahoo.com).

On agronomical point of view, fruit growing better capitalize slopes, sandy soils, sands by comparison with other species of cultivated plants. Growing of trees and bushes is an activity that can significantly contribute to the economic development of different regions, especially in hilly areas.

Despite being one of the most important branches of EU countries, fruit growing is characteristic of the very high percentage of subsistence farms which produce mainly for their own consumption, or sometimes selling on market. Fruit growing is meant as commodity which provides the people with livelihood and also major source of incomes in some areas. In terms of locality and small-scale production, fruit products are also important. It means the fruit products such as jams, marmalades, compotes, ciders, concentrates or dried products [2].

The issue of regional development in fruit growing domain is quite important. Potential development is closely associated with traditions and regional products, including the question of good promotions. Small-scale for local production, local tastes, smells, traditions by "home products" in recent years have become popular topics among consumers, but also in terms of agro tourism development. Sure, they also constitute good rates of employment in the different rural regions [3].

According to the latest trends within the presentation of particular regions within EU the local diversity, specificity and interesting aspects are underlined and can be attractive for the tourism development. The regional character of the fruit growing and its products is the logical implication of this strategy [4].

II. MATERIAL AND METHODS

The scope of this paper is to present the current situation of fruit growing in Romania by comparison with other countries and also, about the role that this activity can have in the rural economy.

Based on data from the literature (statistical data, documents, case studies) was made a comparative analysis with the purpose to present the current trends and future development of the fruit growing sector in the world and Romania in the context of the Erasmus plus project, KA2 Partnerships - "FruitFarming - Role of Traditional Fruit Farming in Regional Development" [5]. This project is focused on sharing experiences at the level of several different organizations from four EU countries (Czech Republic, Poland, Portugal, and Romania) involved in the education and training about fruit growing. The project is aimed on a specific area that is closely associated to agriculture, cultural heritage, local traditions but also to business sector and state

administration. During the project, the curriculum and learning material about fruit growing which will be created will be used for professional training in educational institutions but also in hobby institutions within the scope of project partners.

III. RESULTS AND DISCUSSION

The fruit growing is an important branch of agriculture. Its renaissance is necessary due to the employment preservation as well as of local tradition conservation. The regional development, the marketing of local products as the possible subsequent change of consumption habits of consumers are the very popular theme and topic of many projects and EU policies in the last year's [1].

In the EU-28, the fruit sector accounts for 7% of the total agricultural output value. Fruit growing is a significant direction of agricultural production in EU and also in all countries members.

Study data showed that local food systems support the local economies; for example, local farmers markets positively influence the activity surrounding them, while providing sources of income for local farmers, thereby maintaining the viability of small subsistence farms. Compared to large industrial farms, small family farms are concerned about those expenses for inputs to be conducted within the local community (e.g., machinery, seeds, agricultural supplies, etc). In addition, processed food products at local level and distributed locally (e.g., local restaurants) generate jobs and subsequently help to stimulate local economies of rural communities.

The latest data provided by the Consumer Monitor show that eating fruits and vegetables, in the EU28, amounting to 341.81 g/capita/day. This represents an increase of 5.6% compared with 2012, but a decrease of 1.9% compared with the average of the period 2008-2012. This highlights that this consumption is below the recommended minimum of 400 g of fresh products on the World Health Organization (WHO) [6].

Fruit production is an important element in EU agriculture, with a weight representing 6.7% of total agricultural production. For 2015, the major producers were Spain (16.5%), Italy (9.2%) and France (5.6%) with an economic value of more than 60% of total fruit production. In the EU, the cultivation of fruit trees offers the possibility of obtaining a variety of products. In terms of volume harvested products, the largest amount was obtained from apples (12.7 million tons), followed by oranges (6 million tons) and peaches (2.5 million tons) [7].

In Romania, stimulation of regional development through investments in fruit growing sector is a priority of modern agriculture-based entrepreneurship and new business ideas that invigorate rural community in the area of the user. High performance investment to modernize aging orchards, by introducing modern agronomic practices will help to protect soil desertification, preventing landslides, but also in carbon storage both in soil and in plant mass and woody. Also the modernization of old plantations will lead to special perspectives on further expansion of the business of producing fruit in rural areas, and for adding value to products by

supporting primary processing of fruits at farm and direct marketing products obtained.

Under the new Rural Development Program 2014-2020, EUR 220 million for the modernization and conversion of tree plantations and another 40 million for processing and marketing are allocated. By sub-program for orchards, 35,000 hectares of fruit plantations could be rehabilitated. Moreover, the Ministry of Agriculture wants, until 2020, Romania to dispose 200,000 hectares of orchards [8].

The Romanian climate and soil provide favorable conditions for fruit and shrubs growing, widespread species, depending on their biological requirements, throughout the country, from plain to an altitude of 800-1,000 m.

According to data provided by the Ministry of Agriculture, according to the productive potential of existing orchards, about 52% of the total arable land means declining orchards, about 42% of the total surface is bearing orchards and only 6% of the total surface is young orchards [8].

Romanian fruit growing heritage registered a continuous decline in the past five years, from 207,000 hectares to 145,400 hectares. According to MARD, total fruit production provides about 60% of national demand. Fruit experts consider that a major problem in this sector is determined by the fact that 90% of the farms are less than three hectares, although there should be viable farms of 10-20 hectares [4]. In 2014, the area of fruit plantations (fruit orchards) was 145,400 ha, and total fruit production was 1,115,300 tons (total production of orchards + gardens) [3].

TABLE I
 SURFACE AND PRODUCTION OF FRUIT GROWING IN ROMANIA [3]

Specification	2012	2013	2014
Surface (thousand ha)	142.2	144.0	145.4
Production (thousand)	1128.5	1300.0	1115.2

TABLE II
 CURRENT STATUS OF FRUIT GROWING IN ROMANIA BY CROP SYSTEM [8]

Species	Extensive	Intensive	Super intensive
Apple	34,819.17	22,680.83	821.9
Pear	1,934.09	817.37	75.59
Cherries and Sour Cherries	2,462.60	1,044.78	142.62
Plum	55,602.13	14,993.07	104.8
Apricot	1,004.97	1,027.25	48.8
Walnut	984.00	451.53	8
Shrubs	116.3	1,078.27	236.71
Peaches	162.69	1,137.40	30.6
Strawberry	191.6	451.5	1,439
Others	1,000.39	1,434.23	19.71

The main tree species cultivated in our country belong to the *Rosaceae* family, which includes about 40 species. The most important subfamilies are *Pomoideae*, *Amygdaloideae* and *Rosoideae*. They comprise over half of the main species present in fruit growing in Romania. The main species grown in Romania are: plum and apple. Other species means 17,200 ha and 175,800 tons of fruits.

Depending on the crop system, there are: 98,277.94 ha (68%) extensive orchards (classic), 45,116.23 ha (30%)

intensive orchards, and 2,105.83 ha (2%) super intensive orchards [8].

Of the total 2.5 million ha cultivated worldwide with plum, more than half are found in China (1.7 million ha), followed by Serbia with 168,000 ha, Bosnia and Herzegovina with 80,000 ha and Romania about 70,700 ha. Thus, Romania is the fourth largest producer and third producer in Europe.

Regarding the production of the last year, a total production of 11.3 million tons was recorded, which, in China, was obtained over 5.8 million tons of fruits, and in Romania over 400,000 tons (Fig. 1). For Romania, it appeared that production of plums obtained per unit area is very low. The national average in recent years was of 2100-2400 kg/ha and this was due to the extensive culture and advanced age of most orchards.

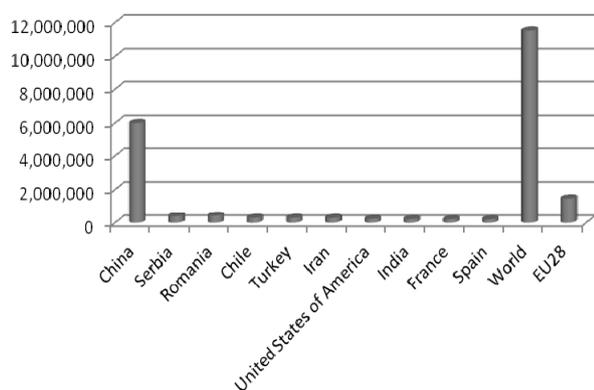


Fig. 1 Main world countries by plums production in 2013 (tons) [9]

The area occupied by apple in the world totaling is about 4.8 million hectares, and the total apple production in 2014 was 76 million tons. Of this amount, 42% was produced in Asia, the largest supplier of apples, followed by Europe with 23% also important supplier of apples, and North America with 9.42%. Among countries, the largest producer of apples turned out to be China, which produced in 2013, 30 million tons are representing 47.3% of total world production and EU countries (27), which produced 15.7 million tons, representing 20% of the world production.

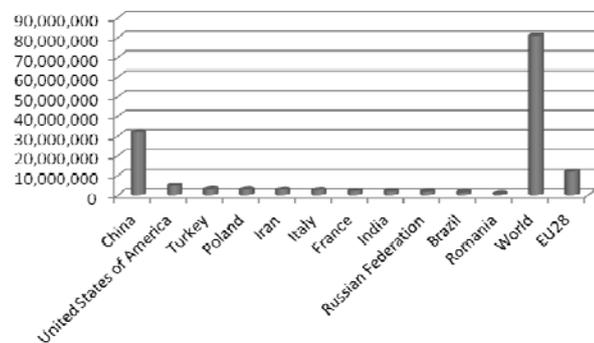


Fig. 2 Main world countries by apple production in 2013 (t) [9]

Major apple producing countries (1.5-2.5 million tons) of the European Union are: France, Italy, Germany, Spain,

Poland, Belgium. In Romania, for 2014 on an area of 57.5 thousand hectares, were harvested about 535,000 tons of fruits.

The pear is cultivated in all continents and world production in recent years has ranged in millions of tons annually. The total surface in the world is 1,766,984 ha, while the EU28 is about 130,000 ha, compared to Romania where is recording 2,827 ha. The pear ranked second in the world after the apple of the fruits for the temperate zone, being focused in China (17 million tons), USA and Argentina (0.7 million tons). By comparison, in Romania, it registered over 0.06 million tons.

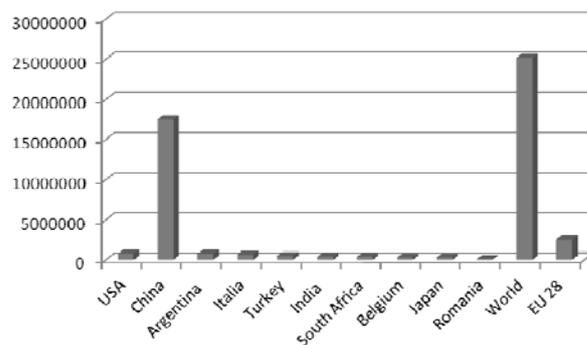


Fig. 3 Main world countries by pear production in 2013 (t) [9]

From apricot, total world surface of 504,000 ha, the largest surface registered in Turkey (over 60,000 ha), Iran (58,726 ha), Algeria (38,828 ha), Italy and Spain (around 20,000 ha). Romania has a surface of 2,081 ha. Worldwide production in 2013 was about 4.1 million tons. Among major countries producing apricots are: Turkey (over 0.8 million tons), Uzbekistan (0.43 million tons), Italy (around 0.2 million tons) and Japan, Pakistan, Ukraine with around 0.1 million tons. Romania registered in 2013 around 0.030 million tons.

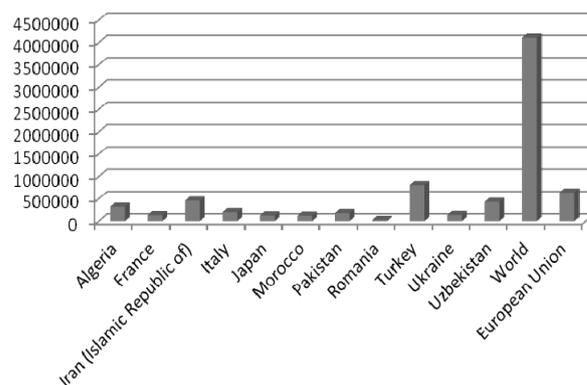


Fig. 4 Main world countries by apricot production in 2013 (t) [9]

Total area recorded worldwide of peaches and nectarines growing is over 0.2 million hectares. More than half are grown in China, 775,000 ha. Other countries as well, USA, Greece, India, have smaller areas of about 50,000 ha. Countries like Turkey, Argentina, Iran follow with surfaces between 21-30,000 ha.

The production in the world is over 21 million tons. The big European production of 3.4 million tons is obtained in several countries; namely, Italy and Spain with over 1.4 million tons and Greece with 0.66 million tons.

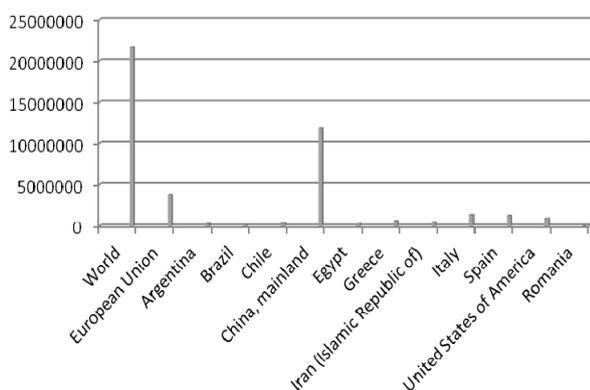


Fig. 5 Main world countries by peaches and nectarines productions in 2013 (t) [9]

Currently, cherry is prevalent in all continents, with a surface of 405,000 ha and a total production of over 2.29 million tons. A larger share is in Europe, 135,540 ha, where it produces about 602,417 tons, that means 26% of world production, and the USA and Canada by about 15% and less in Africa, Asia and Latin America. Romania cultivates about 7150 ha, of which almost half is in the private sector and obtains a production exceeding 80,000 tons.

Regarding global sour cherries, the surface is 229,678 ha with a production of around 1 million tons. Most important producers are: Turkey (179,752 tons), Russian Federation (200,000 ha), Poland (188,000 tons), USA (133,232 tons), Iran (106,962 tons), Poland (33,000 tons).

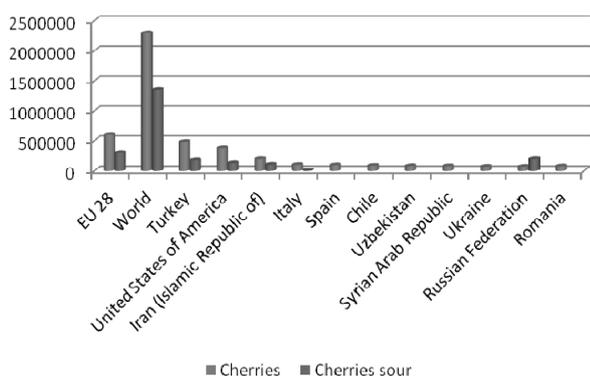


Fig. 6 Main world countries by cherries and cherries sour productions in 2013 (t) [9]

Fruit growing, despite being one of the major branches of Romanian agriculture, is a predominant feature and most of subsistence farms mainly produce for their own consumption, selling on the market only products obtained by chance [3].

In recent decades, growing of fruit in Romania was subject to continuing developments development and modernization of agri-food economy that targeted adaptation to modern principles of market economy.

The skilful absorption of the EU funds, aimed mainly at developing production and storage facilities, contributed to an increase in the competitiveness of Romanian fruit and fruit preparations. It was also facilitated by the fact that farmers organized themselves into producer groups and organizations.

There are 17 of fruit and vegetable producer groups granted preliminary recognition and 10 producer organizations. These organizations are recognized under EU Regulations establishing a common organization of agricultural markets and Order no. 694/2008 on the recognition of producer organizations and producer groups granted preliminary recognition in the fruit and vegetables and how to access financial support by them as amended and supplemented [3]. These associative fruit and vegetables sector were established at the initiative of producers to take advantage of the common market organization [3].

IV. CONCLUSIONS

Research carried out in 2015-2016 has shown the current status of fruit growing in Romania by comparison with the other countries.

Total fruit production provides about 60% of national demand. A major problem in this sector is determined by the fact that 90% of the farms has less than three hectares, although there should be viable farms of 10-20 hectares.

In 2014, the area of orchards was 145,400 ha and total fruit production was 1,115,300 tons (total production of orchards + gardens).

The main species grown in Romania are plum and apple. Other species mean 17,200 ha and 175,800 tons of fruits. Romania has a plum surface of 70,700 ha and is the fourth world largest producer, with a production of 512,459 tons, and third in Europe. For apple, in Romania, on an area of 57,500 ha, about 535,000 tons of apple were harvested.

Investment goal backed by EU funding for fruit growing farms is increasing competitiveness through provision of tools and equipment, upgrading and/or expanding buildings, the establishment of orchards, conversion of existing orchards, and increasing the area occupied by nurseries.

Fruit growing, because of its economic and attributes, has great importance for agriculture and intensifying its growth potential, contributing to increased economic efficiency exploitation of natural conditions favorable climate and soil of Romania.

ACKNOWLEDGMENT

The researches carried out for the elaboration of the present paper were financed by Erasmus+ programme, KA2 Strategic partnerships in VET program, project - 2015-1-CZ01-KA202-013923 - "FruitFarming- Role of Traditional Fruit Farming in Regional Development".

REFERENCES

- [1] Bodea C., "Plant Biochemistry Treaty". Ed. Publisher Socialist Republic of Romania, Bucharest, 1994.
- [2] Toader M., Roman Gh.V., "Handbook of General Agriculture". Ed. Terra Nostra, Iasi, 2014.

- [3] <http://www.madr.ro> Accessed 23/11/2016.
- [4] <http://www.stiriagricole.ro.2015> Accessed 23/11/2016.
- [5] <http://www.fruitfarming.eu/> Accessed 24/11/2016.
- [6] <http://freshfel.org/what-we-do/consumption-monitor/> Accessed 28/11/2016.
- [7] http://ec.europa.eu/eurostat/statistics-explained/index.php/Agricultural_production_-_crops Accessed 29/11/2016.
- [8] Sumedrea D., et al, "Technical and economic guide for fruit growing", Ed. Invel Multimedia, 2014, Pitesti, Romania.
- [9] <http://www.fao.org> Accessed 30/11/2016.

Lecturer Maria Toader is an Agricultural Engineer and PhD in "Agricultural Sciences" (Yield quality of cereals and pseudocereals). She is affiliated with the University of Agronomic Sciences and Veterinary Medicine Bucharest, in Crops Sciences Department. Her research interests include alternative crops for Organic Farming, Food Quality, Renewable Energy, Agro-ecology issues, Plant protection. She has experience in creation of vocational curriculum and educational scenarios based of farmers' and trainees' training needs in agricultural topics; development of online learning resources; design of training seminars & schools, based on the acquisition of targeted skills and competences for the agricultural professionals.

She has published 52 academic articles, including papers and books (9 books) and has participated in several national and EU projects.

Dr Toader is member of the American Association for Science and Technology (AASCIT)

Dr. Gheorghe Valentin ROMAN is a Professor of Field Crops Production in the Faculty of Agriculture, and Vice-president of Field Crops Department in the Romanian Academy of Agriculture and Forestry Sciences and member of the Scientific Board of Danube Soya Association. His expertise covers the areas of Safety, Environmentally Friendly Agriculture Technologies, Organic Agriculture, Food Quality and Biomass Energy. He has published over 200 academic articles and 23 books, including books on Field Crops Production, Conditioning and Storage of Agriculture Products, Organic Agriculture, etc. He was involved in several EU (e-Content, e-ContentPlus, LdV projects) and National research projects in the field of vocational education and training in the agricultural sector, i.e. in the design and the delivery phase of the quality-certified training of organic farmers; identification of the required competences for all operators in the organic agricultural sector.