

STUDY ON FIELD CROPS CURRENT STATUS IN BALKAN COUNTRIES

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Abstract

Balkan Peninsula is a geographic area with specific natural features and historic, social, political and economic evolutions. Analyzed territory has an area of 76,601 thousand hectares and a population of 65,578 people and includes 10 countries (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, FYROM - Former Yugoslav Republic of Macedonia, Montenegro, Romania, Serbia, Slovenia). Agricultural potential of the region is illustrated by 38,435 thousand ha agricultural land and 21,022 thousand ha arable land. Range of field crops consists of cereals (55% of arable land, mainly wheat and barley), oil crops (sunflower, rape, soybean, olive) potato, sugar beet, tobacco, cotton. In the Balkan context, Romania is characterized by an important agricultural potential, expressed by agricultural and arable land (35.15% and respectively 41.80% of all Balkan) and is the leading agricultural producer, dominating especially in cereals (35.9% of the Balkans), oilseeds (44.5% of total) and potato (55.2%). It is estimated that Romania's agricultural potential can be better exploited, such as Romania to contribute more to cover the consumption of agricultural products for the entire Balkan region.

Key words: Balkan Peninsula, agricultural potential, field crops, cultivated area and yields

Balkans includes much of South East European countries and represents a distinct geographical entity, an area with historical evolution, traditions and economic development very similar, but consists of countries with size, natural resources and economic potential therefore quite different. Among these countries are closer political, economic, cultural relations and a degree of integration, which has evolved over time through earlier diplomatic treated (for example, "Balkan Confederation") and new ones (European Union). There are undoubtedly shared economic interests, resulting in the relationship between central and regional authorities (transborder agreements), but also at local communities or companies, and Romania is interested to develop these relationships. In this complex context, this study was organized to analyze the Balkan agriculture and its potential. In this paper, the focus is on the range of crops and its evolution, the average yields and total productions. It worked at two different levels: geographical area, and national area with the intention to obtain an overview of the agricultural production sector, and the desire to capture the regional and national particularities, some specific developments, regional potentials, more or less well used.

MATERIALS AND METHODS

The study consisted of collecting, in a concentrated form and analysis of agricultural

potential in the Balkans and the countries on its territory. For this purpose, were used statistical data from varied sources provided by existing national and international print and online. It is institutions which collect and systematize statistical data in general and focusing on the agricultural production sector in particular. An important source constituted a material broadcast by the central authorities of the analyzed countries, managing natural resources and agricultural activities - ministries of agriculture and rural development, environment, forests, water, agricultural research and development units and agronomic higher education units (Agricultural University of Athens, Agricultural University of Plovdiv, University "Angel Kanchev" in Russe, University of Maribor) and international organizations - FAO Database, Eurostat Database, etc. In the first phase data were collecting and compiling over several years to assess the average situation, eliminating the inherent fluctuations from one year to another, depending on the evolution of environmental, socio-economic and even political factors. Subsequently, study data were retained for 2006 and 2009, which are placed in different economic and climate contexts, in different stages of economic and social development of the Balkan countries. This has allowed to capture trends in Balkans agriculture, the political evolution (Romania and Bulgaria integration in the EU) and the economic crisis facing Europe and the world. The countries analyzed were (in alphabetical order): Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Greece, Former Yugoslav Republic of

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Macedonia, Montenegro, Romania, Serbia and Slovenia (fig. 1). Have been analyzed characteristics of Balkan countries in land use: total area (and population), agricultural land, arable land, pastures and meadows, vineyards and orchards, forest land. Data for arable land are on the main field crops: cereals (wheat, rye, barley, oats, corn), legumes (peas, beans, lentils), oilseeds (sunflower, rapeseed, soybean, linseed), other industrial crops (potato, sugar beet, tobacco, cotton), plus olive groves. Raw data for sown area, yields per hectare (main product), total production and agriculture share in the Balkan Peninsula were processed.



Figure 1 Balkans Region

RESULTS AND DISCUSSION

General Information. The ten countries analyzed have a total area of 76,601 hectares (table 1) and a population of 65,578 inhabitants, resulting in an average population density of 85.6 inhabitants/km². By comparison, Romania holds 31.12% of the area and 33.06% of the population and an average density of 90.9 inhabitants/km². In size, follows Greece, with 13,193 ha (17.22% of Balkans area) and 10,256 thousand inhabitants (15.63%), Bulgaria with 11,100 ha (14.49%) and 8,782 inhabitants (13.39%) and Serbia with 8,836 hectares (11.53%) and 7,498 inhabitants (11.43%).

From the total area of the Balkans, 38,435 ha are agricultural land, representing 50.17% of total, 24,309 ha are occupied by forests and other forest land (31.74%), 1,790 ha have water and puddles (2.33%) and 11,762 ha are land with other destinations (15.40%).

Territories with agricultural use includes 21,022 ha of arable land (54.69% of total agricultural area), 15,074 ha of pastures and meadows (39.22%), 1,334 ha with vineyards, nurseries, orchards and nurseries (6.09%). Romania holds 35.18% of the agricultural area of the Balkans and 41.80% of arable land, which illustrates an important agricultural potential. In this respect, stand out of other countries Greece (8,199 ha agricultural and 2,550 ha arable land), and Bulgaria and Serbia (each with about 5,000

hectares of agricultural land and 3,100-3,300 ha arable land).

Cereals. Cereals occupy about 55% of arable land. The range consists, mainly maize, wheat, barley and oats (table 2), the small areas still grow rye (on 61 000 ha) and rice (in Greece).

Wheat is an important agricultural crop for Balkan agriculture, grown on the largest areas, totaling 5,108 ha or 24.29% of arable land. Wheat areas have high stability over time, although there are some yearly fluctuations. Wheat is grown in all countries in the region, but there are some particularly in Romania (41.90% of the wheat of the Balkans), Bulgaria (24.42%), Greece (13.66%), Serbia (11.11%). Production of wheat was 3,110 kg/ha in average, with very large annual variations of average production, which reflects the plant's sensitivity to negative factors, environmental and technological. The larger and more stable average yields were obtained in Croatia (5,190 kg/ha) Albania (4,023 kg/ha), Slovenia (3,964 kg/ha). Total wheat harvest (in 2009) was 15,886 thousand tons. Largest quantities of wheat were harvested in Romania (34.64% of Balkan wheat), Bulgaria (19.82%), Serbia (13.76%), Greece (12.18%). Note that Romania sown 41.90% of the area with wheat in the Balkans countries and contributed with only 34.64% of the total harvest.

Corn occupies large areas in the Balkan Peninsula, and is grown on 4,663 hectares annually, which represents 22.18% of the arable area. Corn is grown in all countries but particularly in Romania (50.00% of total) and Serbia (25.91%). From the analysis, it results that the corn produced an average of 4694 kg/ha, with variations between 3,416.9 and 9,880.1 kg/ha, depending on the cultivation area and agricultural suitability of years. There are good yields of 9,800 kg/ha produced in Greece, 7,837 kg/ha, in Slovenia, 7,351 kg/ha, in Croatia, and over 5,000 kg/ha in Albania, Serbia, Bosnia and Herzegovina. Total corn harvest was 21,888 thousand tons, the largest contributions to the total harvest having Romania (36.42% of total), Serbia (29.22%), Greece (10.74%) and Croatia (9.97%). In this case, with a corn area representing about 50% of the total corn area, Romania has achieved only 36.41% of the total harvest.

Barley was grown on 1,142 ha or 5.43% of arable land. This crop is present in all the Balkans countries, but particularly in Romania (45.08%), Bulgaria (22.63%), Greece (10.50%), Serbia (8.35%). Total harvest of barley was 3168 thousand tons, mostly from Romania (37.31%), Bulgaria (27.10%), Serbia (9.54%), Greece (8.83%).

Oats are grown in all countries in the region, but on small areas, namely 374 thousand ha, or 1.77%

of arable land, primarily in Romania (53.98%), Greece (17.38%), Serbia (9.46%).

On average oat yields were quite low, the 1466-2980 kg/ha and highly variable, depending on the suitability of cultivation years. The larger and more stable average yields were obtained in Croatia (2980 kg/ha), Bosnia and Herzegovina (2655 kg/ha), Slovenia and Montenegro.

Legumes. Assortment of legumes consists mainly of peas and beans, plus lentils, grown on 4,200 ha (Greece, Bulgaria, FYROM and Croatia). Beans are an important food crop for the Balkans, sown on 92 thou ha, or 0.43% of arable land, particularly in Romania (32.33% of all Balkan), Serbia (25.93%), Albania (15.25%), Bosnia and Herzegovina (10.35%). Field beans average yields ranged from 753.1 to 2,025.8 kg/ha, with the highest average yields enrolling FYROM (2025.8 kg/ha), Slovenia (1,917.8 kg/ha), Albania and Greece. Total harvest of beans was 125 thou t, mainly from Serbia (29.14%), Albania (18.34%), Romania (17.82%).

Oil crops. Range of oil crops consists mainly of sunflower, rapeseed and soy, plus flax oil (14 thou ha in Bulgaria and 0.88 thou ha in Romania) (table 3) and olive.

Olive groves typical Mediterranean, in Balkan countries occupy a total area around 700 thou ha, mainly in Greece (646 thou ha), Albania (40 thou ha), Croatia (15 thou ha), and less in Slovenia, FYROM and Montenegro (1-5 ha in each country).

Sunflower oil is a oil crops cultivated on the largest surfaces, namely on 1648 thou ha, or 7.83% of the arable area. Larger areas can be found in Romania (782 thou ha), Bulgaria (684 thou ha), Serbia (158 thou ha), Greece (23 thou ha). Sunflower crop resulted in average yields between 1,200 and 1,927.7 kg/ha and the total harvest was 2,472 thou tons.

Rape crop has expanded in recent years, reaching 579 thou ha, or 2.75% of arable land and is present in most countries of the region (except in Albania and Montenegro), but more in Romania (71.52%) and Bulgaria (18.70%). Rape crop were taken from 1,374.9 to 2,800 kg seed/ha. The highest average yields were obtained in Croatia (2800 kg/ha), Bosnia and Herzegovina (2698.5 kg/ha), Serbia (2448.7 kg/ha). Total of rape yield was 949 thou tons, Romania's contribution being 60.02% and 24.81% of Bulgaria.

Soybean sown area had wide fluctuations in recent decades. It is currently cultivated on only 244 thou ha, or 1.15%, in all countries in the region, more in Serbia (59.26%), Romania (19.80%), Croatia (18.18%). Soybean culture resulted in production of 966.2 to 2,924.2 kg/ha,

more than 2,400 kg/ha realizing Slovenia (2,924.2 kg/ha), Croatia (2,600.0 kg/ha) and Serbia (2,418.5 kg/ha). Total harvest of soybeans totaled 562 thou tons, the largest contributions to the total harvest with Serbia (62.11%), Croatia (20.48%), Romania (14.99%).

Other crops. Potato it is an important agricultural crop, grown on large areas in all Balkan countries and totaling 465 thou ha, or 2.21% of the arable area (table 4). This culture occupies large areas in Romania (55.96%), Serbia (16.80%), Bosnia and Herzegovina (7.89%), Greece (7.20%). On average potato yields were from 11,270.1 to 25,313.4 kg/ha, quite variable, depending on the suitability of cultivation years and areas, and the highest average yields were obtained in Greece (25,313.4 kg/ha), Slovenia (24,772.5 kg/ha) and Croatia (19,303.6 kg/ha). Total potato harvest was 7133 thou tons. The largest part of the potato production was achieved in Romania (56.13%), Serbia (12.59%), Greece (11.88%).

Sugar beet is grown less in the Balkans. In recent decades, the area gradually declined, reaching only 131 thou ha or 0.62% of total arable land. Sugar beet is grown more in Serbia (46.93% of Balkan), Greece (18.49%), Croatia (17.63%), Romania (16.17%). Sugar beet resulting average yields quite good, 38,607.3 to 52,763.4 kg/ha, higher in Croatia and Serbia. Total harvest of sugar beet roots was 5836 thou tons, more than being provided by Serbia (47.93%), Croatia (20.85%), Greece (17.13%).

Tobacco is a plant specific for Balkans agricultural, grown on 75 thou ha, or 0.36% of arable land. Tobacco is present in all countries in the region, particularly in Bulgaria (36.77%), FYROM (23.48%), Greece (20.26%). In the tobacco crop resulted production from 1,501.9 to 2,201.9 kg/ha, higher in Croatia and Montenegro (over 2,000 kg/ha). Total tobacco crop was 130.4 thou tons, with higher contributions of Bulgaria (39.35%), Greece (21.08%), FYROM (18.49%).

Cotton is grown in the southern Balkans and shrunk over the past decade. Currently, the area sown is between 190 thou and 200 thou ha, of which about 190 thou ha in Greece, and the remainder in Albania and Bulgaria. Total harvest of cotton was 243 thou t.

CONCLUSIONS

Balkan Peninsula is a geographic area with specific, characteristics of natural resources (climate, relief, soil resources, vegetation) and historic, social, political and economic evolution.

Table 1

General information on the Balkans (2009)

Country	Population (thou)	Land and land use categories				
		Total area (thou ha)	Agricultural area (thou ha)	Arable area (thou ha)	Pastures and meadows (thou ha)	Forest area (thou ha)
Albania	3,331	2,875	1,204	612	502	777
Bosnia and Herzegovina	4,621	5,121	2,128	997	1,029	2,185
Bulgaria	8,782	11,100	5,030	3,139	1,719	3,871
Croatia	4,837	5,659	1,300	869	343	1,616
Greece	10,256	13,193	8,199	2,550	4,500	3,872
FYROM	1,940	2,571	1,013	420	558	993
Montenegro	621	1,380	514	173	325	543
Romania	21,681	23,839	13,523	8,789	4,372	6,536
Serbia	7,498	8,836	5,055	3,298	1,459	2,665
Slovenia	2,011	2,027	468	175	267	1,251
TOTAL	65,578	76,601	38,435	21,022	15,074	24,309

Table 2

Wheat and corn crops growing in the Balkans (2009)

Country	Total cereals (thou ha)	Wheat			Corn		
		Area (thou ha)	Yield (kg/ha)	Total production (thou t)	Area (thou ha)	Yield (kg/ha)	Total production (thou t)
Albania	146	83	4,023	333	47	5,569	262
Bosnia and Herzegovina	295	68	3,775	256	189	5,103	964
Bulgaria	1,829	1,248	3,887	4,851	274	4,707	1,290
Croatia	562	180	5,190	934	297	7,351	2,183
Greece	1,174	698	2,622	1,830	240	9,800	2,352
FYROM	178	88	3,076	271	32	4,751	152
Montenegro	5	1	3,598	4	3	3,757	11
Romania	5,265	2,140	2,430	5,200	2,333	3,416	7,970
Serbia	1,919	568	3,647	2,071	1,209	5,292	6,398
Slovenia	101	34	3,964	136	39	7,837	306
TOTAL	11,474	5,108	-	15,886	4,663	-	21,888

Table 3

Oil crop growing in the Balkans (2009)

Country	Sunflower			Rape			Soybean		
	Area (thou ha)	Yield (kg/ha)	Total production (thou t)	Area (thou ha)	Yield (kg/ha)	Total production (thou t)	Area (thou ha)	Yield (kg/ha)	Total production (thou t)
Albania	-	-	-	-	-	-	0,3	1667	0,5
Bosnia and Herzegovina	-	-	-	1	2698	-	4	2155	9
Bulgaria	684	1928	1318	108	2173	235	0,4	966	0,4
Croatia	-	-	-	29	2800	81	44	2600	114
Greece	24	1200	29	4	1500	6	2	2000	4
FYROM	-	-	-	1	2327	2	0,1	2139	0,2
Romania	782	1800	1408	414	1375	569	48	1746	84
Serbia	158	2300	363	18	2449	44	144	2418	348
Slovenia	-	-	-	4	2225	9	-	-	-
TOTAL	1647	-	3118	579	-	948	243	-	560

Table 4

Industrial crops growing in the Balkans (2009)

Country	Potatoes			Sugar beet			Tobacco		
	Area (thou ha)	Yield (kg/ha)	Total production (thou t)	Area (thou ha)	Yield (kg/ha)	Total production (thou t)	Area (thou ha)	Yield (kg/ha)	Total production (thou t)
Albania	9	15000	135	2	30000	60	1	1300	1.3
Bosnia and Herzegovina	37	11270	417	-	-	-	2	1502	3.0
Bulgaria	14	16550	232	-	-	-	28	1841	51.5
Croatia	14	19304	270	23	52763	1214	6	2202	13.2
Greece	33	25313	895	24	41322	992	15	1791	26.9
FYROM	14	14910	209	1	48000	5	18	1355	24.4
Montenegro	10	15095	151	-	-	-	0,1	2159	0.2
Romania	260	15381	4000	21	38607	811	1	1842	1.8
Serbia	78	11491	896	61	45564	27789	6	1613	9.7
Slovenia	4	24772	99	-	-	-	-	-	-
TOTAL	473	-	7244	132	-	5796	77.1	-	132.0

This common territory is fragmented in countries of size, natural resources and economic development quite different, including in terms of agricultural potential and importance of agriculture to national and regional economies. Analyzed territory has a total area of 76,601 ha and a population of 65,578 inhabitants, resulting in an average density of 85.6 inhabitants/km². Balkan countries can be grouped in countries with relatively large area (Romania, 23,829 ha, Greece, 13,193 ha, Bulgaria, 11,100 ha), medium-sized countries (Serbia, 8836 hectares, Croatia, 5659 hectares, Bosnia and Herzegovina, 5,121 ha), and small countries (Albania, 2,875 ha, FYROM, 2,571 ha, Slovenia, 2,011 ha, Montenegro, 1,380 ha). Agricultural potential of the region is illustrated by the total agricultural area of 38,435 ha, of which 21,022 ha are arable, representing 54.69% of total agriculture area. In this regard, emerges Romania, Greece, Bulgaria and Serbia, totaling 82.75% of agricultural land and 84.5% of arable land. Cereals are the most important field crops for Balkans agriculture, being sown on about 55% of arable land. The cereal assortment includes wheat, corn, barley, oats, and on small areas, rye and rice. Total grain production is 41,379 thou tons, resulting in an average of 631 kg grain/capita/year. In this regard, countries in the region differ considerably, in that some countries produce 686-1184 kg grain/capita and year, covering their availability for domestic consumption and export are Romania, Bulgaria, Croatia, Serbia, while others produce under 300 kg grain/capita/year and are dependent on imports to cover domestic consumption (Montenegro, Albania, Slovenia, Bosnia and Herzegovina). Grain legumes species of great agronomic and food importance, are grown less in the Balkans, and are represented mainly beans (with 92 thou ha total area); major producers are Serbia, Albania and Romania. The assortment of oil crops consists of sunflower, rape, soybean, olive and linseed. Sunflower is the most important oil plants and is cultivated in Romania, Bulgaria, Serbia and Greece, the first two countries are major producers. By comparison, rape and soybean are present in all Balkan countries, but significant producers are Romania and Bulgaria, for rape, and Serbia, for soybeans. Potato is an important crop for the Balkans, present in all countries, but the expansion of areas and productivity are very different. Greece and Slovenia are most competitive, with average yields around 25,000 kg tubers/ha.

Characteristic species of the Balkan area are: tobacco, grown in most countries, but especially in Bulgaria, Greece and FYROM; cotton, concentrated in Greece; olive, grown in Greece

(the third largest producer in the world, after Spain and Italy), Albania, Croatia, and less in Slovenia, FYROM, Montenegro. Romania has an important agricultural potential expressed by agricultural and arable land respectively areas (35.18% and 41.80% of all Balkans). Romania is the largest agricultural producers in the region, especially dominating the production of cereals (14,873 tons, in 2009, 35.9% of total production of the Balkans), oilseeds (44.5% of total) and potatoes (55.2%). Compared to cultivated areas, we can say that Romania's agricultural potential is not sufficiently valued, whether considering the rather low average yields, for example, achieved the lowest average production of wheat, corn, rape, soybean, beet sugar, and most small productions to other cultures. Of course, there are some reasons for these negative results, like growing diversity in terms of climate and soil conditions, and the large share of households which mostly practice subsistence agriculture. It is clear that a better organization of agricultural production would allow adequate recovery of Romania's agricultural potential, and thus could contribute more to cover food and agriculture consumption for the entire Balkan region.

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