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FACTORS AFFECTING THE MECHANIZATION OF PLANT PRODUCTION IN HUNGARY

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Abstract: The natural and climatic conditions of Hungary are extremely suitable for agricultural production and producing raw materials. As a result of the historical conditions and the continuous changing of the structure of the economy, the number of the economical organizations dealing with agricultural activities went through significant changes.

In our paper, we study the following factors which affect the mechanization of plant production:

- Changes of the number of farms: it can be stated that the number of individual farms decreased continually, while the number of economical organizations increased significantly,
- Type of production: considering the type of production, nearly half of the organizations making agricultural activities are dealing exclusively with plant production, the majority of them perform mixed farming, while the number of those who are keeping only animal stock is slight compared to the previous,
- Changes of agricultural land use: based on the distribution of the cultivation methods of farms – nearly 80% – used their lands as arable lands. The rate of the orchards and vineyards did not reach 2%.
- Changes of quality and quantity of the agricultural machinery: since the role of agricultural machinery in agriculture is particularly significant. These machines basically influence the amount, quality and cost of production.
- Annual change of the contribution to the Hungarian GDP.

By processing of the results and drawing the conclusions, it will be possible to further analyze the mechanization of agriculture in detail and to compare these results with the general needs.

Key words: agricultural production, number of farms, land use, machinery

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INTRODUCTION

The natural and climatic conditions of Hungary are extremely suitable for agricultural production and producing raw materials.

As a result of the historical conditions and the continuous changing of the structure of the economy, the number of enterprises dealing with agricultural activities went through significant changes [4].

In our present paper, we study the following factors which affect the agricultural production:

- the changes of the number of farms,
- the type of production,
- the changes of agricultural land use,
- the changes of quality and quantity of the agricultural machinery.

On the basis of the results and conclusions, it will be possible to analyze the mechanization of agriculture in detail and to compare these results with foreign examples. The data in our present paper originate from the publications of the Central Statistical Office (KSH - Központi Statisztikai Hivatal), the publication of other experts [2,5].

RESULTS AND DISCUSSION

The number of farms

In the last four decades the number of enterprises dealing with agricultural activities was changing unpredictably. As a consequence of the union of the large-scale farms in the 1970's and 1980's, significant decrease was typical to this period. Then by creating new types of organizations in the 1990's, the number of economical organizations increased drastically by the millennium. After the decrease between 2000-2007, their number raised again and according to the previous results of the monitoring 8800 economic organizations were dealing with agricultural activities in 2010.

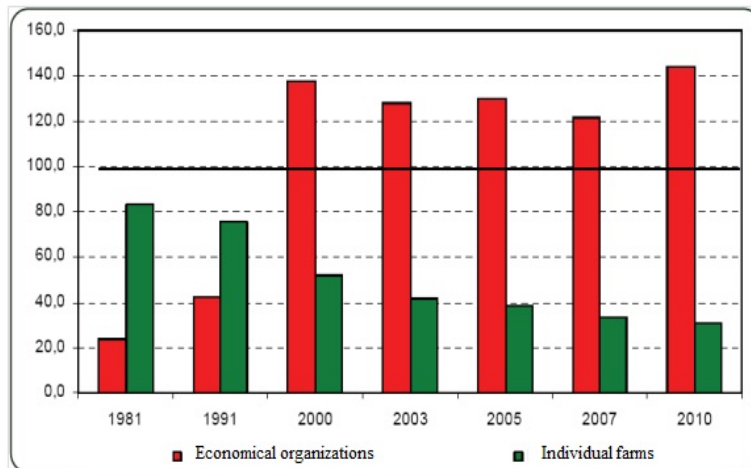


Figure 1. The number of economical organizations dealing with agricultural activities (1972 = 100)

The number of individual farms continually reduced throughout the last four decades. Between 1991 and 2000, the reduction of the number of farms mainly originated from the ending of the household farms and use of the stipend (grant) land. The nearly 40% decrease of the number of organizations in the first decade after the millennium is due to the disadvantageous farm structure, the deficit of capital and the lack of eligible specialized knowledge. According to the previous results of the monitoring, in 2010, 567 thousands of individual farms made agricultural activities.

Type of production

Forty nine per cent of the agricultural enterprises deal with plant production as the only business unit, their rate grew by 8% compared to 2000. The number of economic organizations keeping only animal stock decreased by 4% through the last 10 years, their rate is only 5,5%, while those who are performing mixed farming – with 3% increase – nearly 40%. The rate of the economic organizations performing agricultural services only – after nearly 8% decrease – does not reach 6%.

Forty nine per cent of the individual farms deal with plant production, barely more than 22% only with keeping animal stock, and 29% dealt with both in 2010. This means 9% increase for those dealing with plant production only, and the same decrease for those performing mixed farming compared to 2000. The rate of keeping only animal stock is practically constant. The rate of individual farms doing agricultural services is vanishing. The considerably inflexible structure originates from the purposes of the individual farms differ from the purposes of economic organizations.

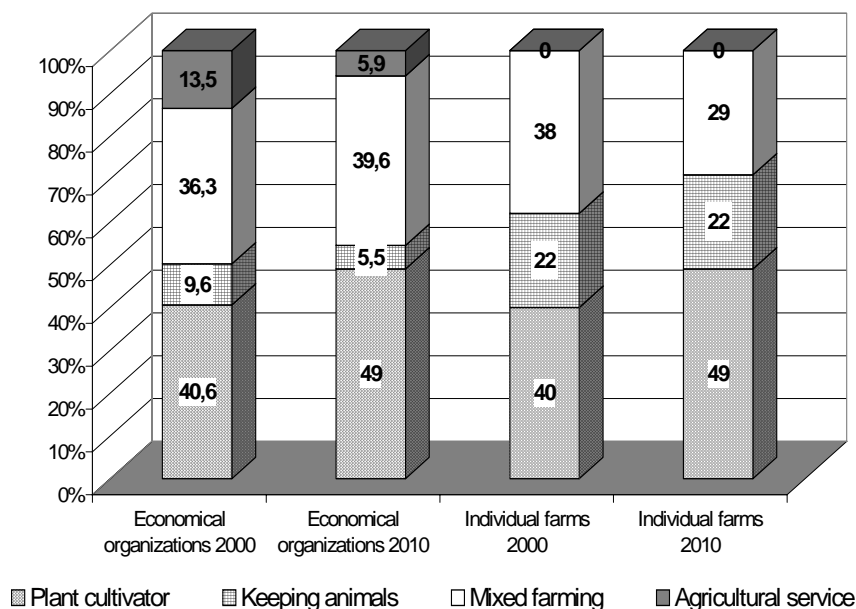


Figure 2. The distribution of the number of farms by producing type, 2000 and 2010

Agricultural land use

Similarly to the previous years, 99% of the farms having arable land, use agricultural area. The average size of this area was 337 hectares in case of economical organizations and 4,6 hectares in case of individual farms in 2010. Since 2000, the average agricultural area of economical organizations decreased by 37%, the area of individual farms increased by 85%. There was not any significant change in the distribution of the agricultural area by cultivation methods.

Sixty per cent of the economic organizations and 55% of the individual farms used arable land in 2010. The rate of it increased by 13% in the economic organizations, and decreased by 7% in the individual farms since 2000. The average size of the arable land per one farm decreased by 30% in economic organizations and doubled in individual farms in the last decade.

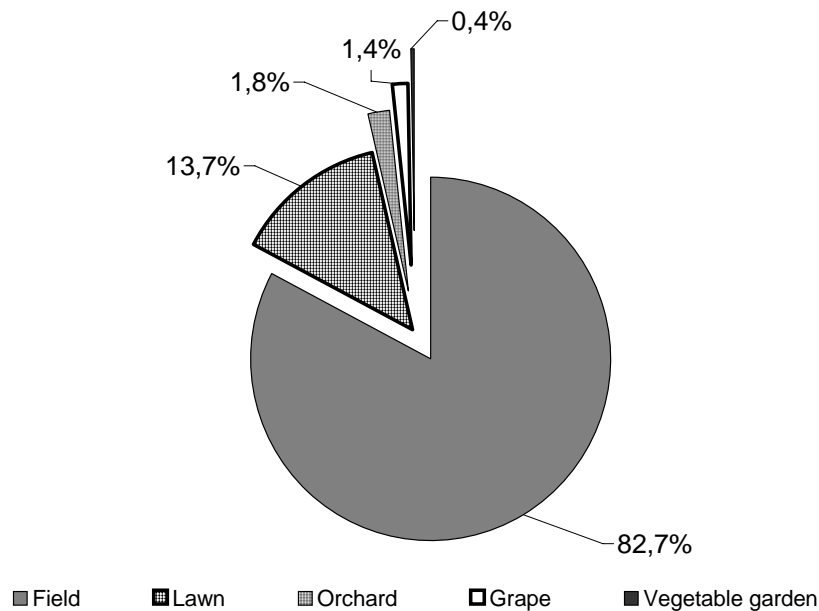


Figure 3. The distribution of the agricultural area by cultivation methods, 2010 (all farms)

Agricultural machines

The role of agricultural machines is particularly significant. These machines basically influence the amount, quality and cost of production.

Since the last total survey of the agricultural machines happened in 2000 – the statements made later were about agricultural tractors and combines only –so it could only be estimated how the equipment of agriculture is changing.

According to the results of 2000 and 2005 survey, it can be stated that the domestic machine park is quite outworn and old.

In 2005, the rate of individual farms from total is 98,9%, their average size is 3,93 hectares/farm, and their participation from all of the area cultivated by machines was 59,2%. In spite of this, these farms operated 80,4% of tractors (pieces), and 76,0% of agricultural tractors and combines (pieces).

In domestic farms, the age structure of agricultural machinery is very unfavorable and in this area the numbers of smaller farms are the worse. According to the data collected by KSH, the average lifetime of agricultural tractors was 12,4 years in economic organizations, while in individual farms it was 16,1 years. The lifetime of agricultural combines was 11,5 and 18,3 years.

According to the survey of AKI (Scientific Institute of Agricultural Economics), only 13218 pieces of tractors (on the average 2644 pieces·year⁻¹) 2220 pieces of agricultural combines (on the average 444 pieces·year⁻¹) and altogether 16888 pieces (on the average 3378 pieces·year⁻¹) of agricultural machines were purchased in the five years between 2000 and 2005. Therefore the machine park became older in this five year-period due to the lack of replacement.

The number of tractors purchased between 2005 and 2009 was 13434 pieces (2687 pieces·year⁻¹), the number of combines was 1892 pieces (378 pieces·year⁻¹) and altogether the agricultural machines were 18209 pieces (3642 pieces·year⁻¹) (Tab. 1.), thus the latter – considering all the agricultural machinery – is slightly more, but it did not restrained the further aging of the agricultural machinery park. However, the accurate data of the machinery park and the rejection are not known, calculating only with 0,5% yearly increase of tractors between 2005 and 2009, and with the number of machines in 2005 in case of the combines, based on rough estimation, the average utilization time of tractors reached 18,3 (in 2005) from 15,3 (in 2000), due to the low amount of new machine purchasing, thus in 2009 the average expected lifespan of tractors approached 40 years. In case of the combines, the average utilization time reached 16,7 years (in 2005) from 15,0 years (in 2000), and increased 17,9 years in 2009.

Table 1. The purchasing of agricultural machines

Name	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Tractors	1401	2069	3731	4511	1506	2040	1827	3253	3261	3053
Agricultural combines	170	449	717	700	184	323	212	442	412	503
Self-propelling loaders	110	175	493	306	87	396	332	391	599	425
Self-propelled harvesters	4	13	19	26	5	10	4	11	14	18
Other self-propellers	3	2	13	27	167	258	171	53	67	134
Altogether	1688	2708	4973	5570	1949	3027	2546	4150	4353	4133

The following data show that from 1985 to 2005 the number of tractors in Hungary increased more than 100%. In Fig. 4, we can see the number of tractors per 10000 hectares of arable land in Hungary.

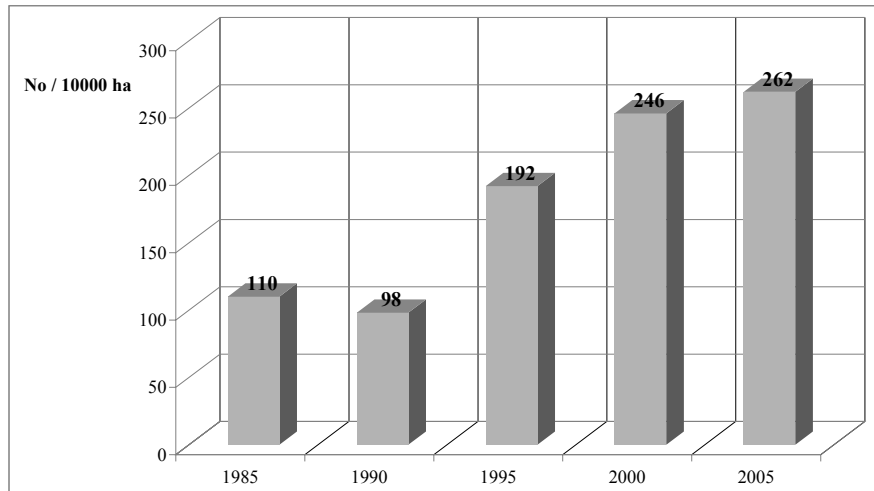


Figure 4. The number of tractors per 10000 hectares of arable land in Hungary

CONCLUSIONS

The natural and climatic conditions of Hungary are extremely suitable for agricultural production and producing raw materials.

As a result of the historical conditions and the continuous changing of the structure of the economy, the number of the economical organizations dealing with agricultural activities went through significant changes.

In our present paper, we study the following factors which affect the agricultural production:

- the changes of the number of farms: it can be stated that the number of individual farms decreased continually, while the number of economical organizations increased significantly.
- the type of production: nearly half of the organizations making agricultural activities are dealing exclusively with plant production, the majority of them perform mixed farming, while the number of those who are keeping only animal stock is slight compared to the previous.
- the changes of agricultural land use: based on the distribution of the cultivation methods of farms that have fields, it is clear, that the majority of the farms – nearly 80% - used their lands as arable lands. The rate of the orchards and vineyards did not reach 2%.
- the changes of quality and quantity of the agricultural machinery: since the role of agricultural machinery in agriculture is particularly significant, these machines basically influence the amount, quality and cost of production.

By processing of the results and drawing the conclusions, it will be possible to further analyze the mechanization of agriculture in detail and to compare these results with foreign examples.

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FAKTORI KOJI USLOVLJAVAJU MEHANIZACIJU BILJNE PROIZVODNJE U MAĐARSKOJ

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Sažetak: Prirodni i klimatski uslovi u Mađarskoj su izuzetno povoljni za poljoprivrednu proizvodnju i proizvodnju sirovih materijala. Kao rezultat istorijskih uslova i kontinuiranih promena ekonomske strukture, broj ekonomskih subjekata koji se bave poljoprivredom trpeo je značajne promene.

U ovom radu proučavali smo sledeće faktore koji uslovljavaju mehanizaciju biljne proizvodnje:

- Promene broja: može se zaključiti da je broj pojedinačnih farmi kontinuirano opadao, dok je broj ekonomskih organizacija značajno rastao.
- Tip proizvodnje: gotovo polovina poljoprivrednih organizacija se primarno bavi biljnom proizvodnjom, a većina njih ima i mešovitu proizvodnju, dok je broj onih koji se bave stočarstvom znatno manji.
- Promene u upotrebi poljoprivrednog zemljišta: na osnovu raspodele metoda obrade zemljišta na farmama - blizu 80% koriste svoje posede kao obradivo zemljište. Udeo voćnjaka i vinograda nije dostizao 2%.
- Promene u kvalitetu i kvantitetu poljoprivredne mehanizacije: obzirom da je uloga mašina u poljoprivredi posebno značajna, ove mašine imaju odlučujući uticaj na količinu, kvalitet i troškove proizvodnje.
- Godišnje promene učešća u mađarskom BDP.

Obradom rezultata i izvođenjem zaključaka biće moguća dalja detaljna analiza poljoprivredne mehanizacije i poređenje sa generalnim potrebama.

Ključne reči: poljoprivreda proizvodnja, broj farmi, upotreba zemlje, mehanizacija

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