

CULTIVATION OF MEDICINAL, AROMATIC AND SPICY PLANTS IN SLOVAKIA AFTER JOIN THE EUROPEAN UNION

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SUMMARY

European Union represents the biggest unique market with medicinal, aromatic and spicy plants (MASP) in the world. It was about 120,000 tons (e.g. 200 million USD) of this plant material during the years 1991-2004. Paper is orientated on the current status and situation in the field of MASP grown and produced in Slovakia. Growing areas of these plants were the lowest in 1999 (467.44 ha) and the highest in 2003 (851.85 ha). Global production varied between 222.2 (2000) and 1380.2 tons (2004). Average yields ranged from 0.32 (2000) to 2.60 t.ha⁻¹ (2004). Acute problem is to increase and stabilize the production and to obtain stronger position on global herbal market. The objectives of future medicinal plant strategy are: (1) To ensure the quality of MASP material used as the source for herbal medicine to improve the quality, safety and efficacy of finished herbal products; (2) To improve national and/or regional good agricultural practice, processing guidelines, publications about MASP and related standards for operating procedures; (3) To encourage and support the sustainable cultivation and collection of good quality MASP, in ways that respect and support the conservation of the environment. As an alternative for MASP producers can be the organic production of MASP. Demand for organic products is still increasing in EU as well as the consumption of natural substances.

Key words: cultivation, medicinal, aromatic, spicy plants, production

INTRODUCTION

Cultivation of medicinal, aromatic and spicy plants (MASP) has recorded long tradition in the agri-ecological conditions of Europe. It was originated in Mediterranean, where many MASP species were produced in the past. From the point of view biodiversity, there are approximately 130 – 150 MASP species cultivated in Europe and 150 – 170 MASP species are collecting from their natural resources nowadays. As the most cultivated MASP in Europe are: *Carum carvi* L., *Coriandrum sativum* L., *Foeniculum vulgare* Mill., *Silybum marianum* (L.) Gaertn., *Pimpinella anisum* L., *Artemisia absinthium* L., *Matricaria recutita* L., *Hypericum perforatum* L., *Mentha piperita* L., *Melissa officinalis* L., and *Lavandula angustifolia* Mill.

Producers in most Central European countries are in close contact with processors, which determine requirements for type and amount of demanded MASP raw material. Different types of private or state producers cultivate the MASP species in Slovakia:

- Specialized farms for MASP cultivation;
- Farms produce MASP supplementary;
- Agricultural companies with their own processing of MASP products or semi-products
- Industrial processing organizations – pharmaceutical, food or cosmetics, including global companies. They secure the required amount of raw material by contracts with individual producers;
- Research, educational organizations or botanical gardens;
- Gardens on small areas (less than 400 m²).

The importance of MASP is varied. It is orientated to different using of processed plants, their parts or utilizing of active ingredients in these areas:

- Human and veterinary medicine, pharmaceutical and cosmetics industry use the medicinal plants as a raw material;

- Food industry (e.g. brewery), tobacco industry, cosmetics industry use aromatic plants as a raw material;
- Food industry (producing of foods, canning industry, alcohol production) as well as homes are using of spicy plants.

RESULTS AND DISCUSSION

Current status of MASP cultivation in Europe

European Union represents one of the biggest unique markets with medicinal, aromatic and spicy plants (MASP) in the world. It imports about 120,000 tons with the value of 200 millions US\$ in average during 1991 – 2004 (UN Comtrade, 2004). This market exchanges increase every year between 5 – 10 % (Lange, 1998). The most important importer within European MASP market is Germany with more than 45,000 t.year⁻¹ (e.g. 38 % of global European import). It is followed by France with 17 % and Italy with 9 % of global import (Commonwealth Secretariat, 2001). Germany is also the biggest (re-) exporter of MASP within EU (Tables 1 and 2). It exports circa 15,000 t.year⁻¹ to the other EU countries and to the USA. The next big exporters are: France, Poland, Hungary, and Czech Republic etc. The most important non-European suppliers of MASP to the EU countries from the point of view value of global import of these commodities are: USA (15.80 %), India (8.00 %), China (7.45 %), Bulgaria (6.44 %) and Egypt (5.47 %).

Table 1: The cultivation acreage of medicinal, aromatic and spicy plants (MASP) in selected European countries in 2003 (UN COMTRADE, 2004).

Country	Acreage [ha]	Country	Acreage [ha]
Belgium	100	Poland	30,000
France	25,000	Austria	4,300
Netherlands	2,500	Slovakia	1,500
Ireland	50	Slovenia	100
Hungary	37,500	Switzerland	150
Germany	12,000	Great Britain	4,000

Table 2: Market with MASP in selected EU countries in 2003 (UN COMTRADE, 2004).

Country	Export [t]	Import [t]	Balance (I – E) [t]	Export value [\$]	Import value [\$]
Slovakia	603.2	347.8	-255.4	1,206,720	971,495
Germany	16,729.9	45,700.5	28,970.7	73,449,000	100,720,000
France	8,150.0	18,234.3	10,084.3	52,500,880	48,902,956
Belgium	1,935.4	4,795.5	2,860.1	19,888,968	23,879,468
Poland	14,469.9	4,755.2	-9,714.7	27,935,000	8,069,000
Czech Republic	767.2	2,835.7	2,068.5	2,487,306	7,202,909
Hungary	3,012.9	983.1	-2,029.7	6,845,000	3,060,000
Austria	1,625.7	2,160.9	535.2	4,975,798	7,590,191
Italy	2,216.8	11,509.1	9,292.2	10,530,507	38,672,596
Latvia	5.5	180.7	-255.4	41,207	714,030

Current status of MASP cultivation in Slovak Republic

Cultivation of MASP as a part of special plant production is a main activity to obtain required amount and quality of domestic MASP species when the protection of natural

resources is increasing. Because of multi-year results of research and their application in agricultural practice, the technology of MASP cultivation of 30 species is described in details. About 50% of these species belongs to produce of high capacity drugs.

Ministry of Agriculture of Slovak Republic in cooperation with Research Institute of Agri-ecology in Michalovce published “Development program of production and processing of medicinal, aromatic and spicy plants in Slovak Republic” (Šalamon, 2000). Prognosis of MASP acreage (Table 3), improvement of technology in production and processing of MASP as well as analysis of MASP industry in Slovakia are given in the document.

Table 3: Prognosis of MASP cultivation area as enlarging in Slovak Republic (Šalamon, 2000).

Years	Unit	1970-1980	1980-1990	1990-2000	2000-2010	2010-2020
Cultivation acreage	ha	150	350	370	1,500	2,500
Production	t	165	385	410	1,650	3,000

Development of cultivation acreages of MASP has oscillated in the last decades. The MASP were cultivated in the 1989 at the area of 408.3 ha, in 2000 it was 783.6 ha and in 2004: 540.4 ha. Cultivation of MASP in Slovak Republic according to Statistical institute of Slovakia during 1997 – 2005 is presented in Table 4.

Table 4: Development of harvested acreage and production of cultivated medicinal plants in Slovak Republic (1997-2005).

Year	Harvested acreage [ha]	Total yield [t]	Yield [t.ha ⁻¹]
1997	527.37	328.9	0.62
1998	540.55	439.9	0.81
1999	467.44	475.2	1.02
2000	696.56	222.2	0.32
2001	623.98	873.1	1.40
2002	601.65	989.9	1.65
2003	851.85	821.4	0.96
2004	531.07	1380.2	2.60
2005	*709.71		

* Harvested acreage in 20th May 2005.

The harvested acreages of aromatic plants are presented in Table 5.

Table 5: Development of harvested acreage and production of aromatic plants in Slovak Republic (1997-2005).

Year	Harvested acreage [ha]	Total yield [t]	Yield [t.ha ⁻¹]
<i>Humulus lupulus</i> L.			
1997	816.41	742.1	0.91
1998	151.29	261.4	1.73
1999	238.30	233.6	0.98
2000	273.39	95.7	0.35
2001	246.16	188.1	0.76
2002	317.60	297.6	0.94
2003	318.41	323.2	1.02
2004	307.82	363.8	1.18
2005	*310.66		
<i>Nicotiana tabacum</i> L.			
1997	649.16	994.1	1.53
1998	958.87	1487.4	1.55
1999	834.89	1288.6	1.54
2000	1133.57	1870.4	1.65
2001	1245.27	1986.9	1.60
2002	1099.83	2020.1	1.84
2003	1079.55	1932.1	1.79
2004	934.51	1298.2	1.39
2005	*957.33		

* Harvested acreage in 20th May 2005.

As the most cultivated spicy plant was red pepper (*Capsicum annuum* L.) despite the fact, that acreage decreased from 2,289 ha (1975) to 254 ha (2003). Global acreage of red pepper was the lowest in 2003: 254 ha with yield of pepper fruits about 228.1 t. The largest harvested area was 718 ha (1998) with yield of 1,024 t (Table 6).

Table 6: Development of red pepper (*Capsicum annuum* L.) acreage and its production in Slovak Republic (1997-2005).

Year	Harvested acreage [ha]	Total yield [t]	Yield [t.ha ⁻¹]
1997	551.67	666.3	1.21
1998	718.12	1024.2	1.43
1999	560.34	827.0	1.48
2000	536.28	540.2	1.01
2001	333.06	482.1	1.45
2002	272.52	377.8	1.39
2003	254.00	228.1	0.90
2004	460.32	450.2	0.98
2005	*463.38		

* Harvested acreage in 20th May 2005.

Caraway (*Carum carvi* L.) is the second most produced spicy plant in Slovak Republic. Statistical data are documented from 1998 (Table 7).

Table 7: Development of harvested acreage of Caraway (*Carum carvi* L.) and its production in Slovak Republic (1997-2005).

Year	Harvested acreage [ha]	Total yield [t]	Yield [t.ha ⁻¹]
1997	-	-	-
1998	90.26	49.1	0.54
1999	80.03	19.3	0.24
2000	51.00	14.5	0.28
2001	117.00	75.5	0.65
2002	258.28	216.3	0.84
2003	174.31	37.9	0.22
2004	249.78	54.6	0.22
2005	*166.82		

* Harvested acreage in 20th May 2005.

Main aspects that determined cultivation of MASP in Slovak republic are:

- Market demand – production depends on requirements of processors;
- Supplier – consumer contracts;
- Prices of production;
- Development of processing subjects;
- Competition;
- Availability of traditionally required or introduction of non-traditional plant species;
- Macro-economic processing conditions – support possibilities of business activities (EU funds, state subsidies, tax benefits etc.).

Balance of foreign trade with MASP and their products obtained always-negative values (Table 8) because of higher import of these commodities. Slovakia imported about 5,048.5 t of MASP raw material or products. In comparison to the year 1997 (1,308.4 t) import was increased almost four times. This fact confirms higher consuming of these commodities in the country.

Table 8: Balance of foreign trade with MASP in Slovak Republic (UN Comtrade, 2004).

Year	Export [t]	Import [t]	Balance (I – E) [t]	Export value [\$]	Import value [\$]
1994	507.3	3,030.1	- 2,522.8	1,629,466	1,772,966
1995	560.3	2,859.1	- 2,298.8	1,624,248	2,104,958
1996	675.2	3,235.1	- 2,559.9	1,601,461	1,780,203
1997	429.8	1,308.4	- 878.6	1,015,778	890,356
1998	478.3	1,980.7	- 1,502.4	1,055,366	1,126,275
1999	536.0	5,092.6	- 4,556.6	1,052,977	2,071,783
2000	456.1	4,657.7	- 4,201.6	720,065	1,718,252
2001	538.7	4,334.1	- 3,795.4	835,739	1,636,996
2002	293.6	4,697.2	- 4,403.5	614,437	2,092,672
2003	603.2	5,389.5	- 2,522.8	1,206,720	2,994,152

Year	Export [t]	Import [t]	Balance (I – E) [t]	Export value [\$]	Import value [\$]
2004	211.9	5,048.4	- 4,836.6	423,710	3,732,313

Main MASP supplier countries to Slovak Republic are: Czech Republic, Bulgaria, Poland, Croatia, Romania, and Ukraine. Export in 2004 was about 211.9 t and in comparison to 2003 (603.2 t) significantly decreased. Export of domestic MASP products is orientated mainly to EU market: Czech Republic, Poland, Italy, Germany, Hungary, and Australia as well. Very important factor when to export these commodities is optimizing of delivery-supply relationships with the aim of purchase guarantee.

CONCLUSION

Cultivation of medicinal, aromatic and spicy plants (MASP) in Slovak Republic after the EU accession knots at the pre-accession period. Situation in agricultural subjects is dramatically developing. Reserves in supporting of MASP producers are necessary to solve systematically through Ministry of Agriculture. Stable realization of production with optimum qualitative parameters and existence of products with competition ability, strengthens the position at the domestic market and creates the better position to success at the European trade. One of the alternatives for MASP producers could be production of these commodities in organic (ecological) farming systems. Realization of organically certified products as well as the consuming of natural products has recorded increasing demand in the EU trade during the last years.

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