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ROUTING OF VEGETABLE PRODUCTION IN THE NITRA REGION IN 2002–2010

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The paper deals with the evaluation of the development of cultivation area and production of vegetables in different districts of the Nitra region in the period of the years 2002–2010. The region of Nitra has excellent climatic conditions for the cultivation of agricultural crops, including vegetables. Among the most widely grown vegetables belong cabbage, carrots, parsley, onions, tomatoes, peppers, red watermelons, and sweet corn.

Keywords: vegetables, production, area

The Nitra region covers an area of 6,343 km², occupying 12.9% of the area of Slovakia. In the region there are 350 municipalities, 15 of which have city status. The county is divided into seven districts, namely: Komárno, Levice, Nitra, Nové Zámky, Šaľa, Topoľčany, and Zlaté Moravce. The largest of them is the Levice district, and conversely the smallest one is the Šaľa district.

The land relief of the region is flat, punctuated by hills. The mountain range Tríbeč stretches to the north. The northeast part is bordered by the foothills of the Štiavnické vrchy and the Pohronský Inovec. The southern and southeastern parts belong to the Danubian plain. The following rivers flow through the region: the Danube, the Váh, the Nitra, the Hron, the Žitava, and the Ipeľ. There is good quality agricultural land, especially moderate loamy soils (Srničková, 2012). The region has excellent climatic conditions for the cultivation of agricultural crops, including vegetables (Uher, 2011).

Material and methods

To assess the production of vegetables in the Nitra region, we used available official data of the Statistical Office of the Slovak Republic from 2002 to 2010 (Rozborilová et al., 2010) and other sources and published papers (Jureková et al., 2005; Meravá et al., 2009). The data obtained were processed in tables and figures, by area (ha) and production of vegetable species (t) in different districts during the reporting year (Valšíková et al., 2011). The tables are complemented by verbal commentaries. In the tables, the kinds of vegetables that are cultivated in small areas and their production are omitted. All data represent the management on arable land except of gardens.

Results and discussion

Acreage and production of vegetables in the Nitra region by districts in 2010 is given in Table 1. Based on this, it is clear that the vegetables are grown on the largest area of arable land (937 ha) in the district of Levice. Vegetables were planted approximately on the same area of 780 ha

in the districts of Komárno and Nové Zámky. There was 593 ha of vegetables grown in the Nitra district (Meravá et al., 2011).

The greatest volume of vegetables was produced in the district of Levice (7,343 t), followed by the Nové Zámky district (7,114 t) and the district of Komárno (4,538 t). The district of Šaľa produced 2,775 t, the district of Nitra 2,091 t of vegetables. The lowest volume of vegetables was produced in the districts of Topoľčany (123 t) and Zlaté Moravce (27 t). The percentage of participation on production according to the districts is given in Fig. 1.

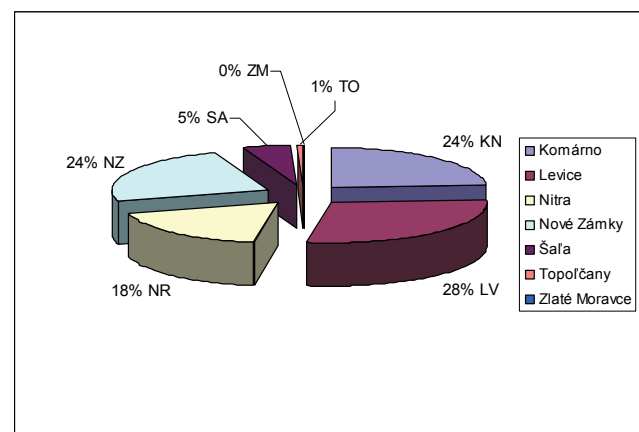


Figure 1 Participation of districts on the production of vegetables in the Nitra region in %

The area of vegetables production

In Table 2 we evaluate the area of vegetable species in the years 2002–2010 in the district of Komárno. From this it can be seen that since 2002, the production area declined from 2,020 ha in 2002 to 782 ha in 2010. The lowest value was recorded for 2009 (Valšíková and Uher, 2009). Parsley with parsnips, onions, tomatoes, white cabbage and peppers were grown in 2002 on the largest area. For these and other species the growing area has reduced over the time (Valšíková et al., 2011).

In 2002, the district of Levice marked 1,606 ha of vegetables. From that amount, tomatoes were grown on 346 ha, corn on 269 ha, gherkins on 243 ha and beans on

Table 1 Harvested area and production volume in the districts of the Nitra region in 2010

Districts	Area of vegetables in ha	Production of vegetables in t
Komárno	782.42	4,538
Levice	937.31	7,343
Nitra	593.51	2,091
Nové Zámky	783.73	7,114
Šaľa	161.71	2,775
Topoľčany	16.82	123
Zlaté Moravce	4.30	27
Total in the region of Nitra	3,279.80	24,012

Table 2 Harvested area of most grown species of vegetables in the district of Komárno in ha

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	252.37	244.63	141.35	63.52	85.47	60.68	49.40	43.36	36.23
Cauliflower	52.68	39.88	38.59	31.21	34.20	16.62	9.25	12.74	14.05
Savoy cabbage	40.39	34.25	30.80	14.87	22.79	12.94	9.92	9.45	9.94
Kohlrabi	41.61	47.95	37.95	29.26	35.79	23.84	10.62	15.52	17.20
Carrots	180.61	108.59	126.24	65.73	69.08	80.18	54.31	71.44	39.71
Parsley and parsnips	278.86	143.33	139.58	135.76	127.43	120.01	114.68	110.99	136.78
Cucumbers	54.26	35.73	27.48	33.36	28.11	29.93	3.28	6.45	5.70
Watermelon	145.85	168.71	137.76	117.74	73.08	67.75	53.97	41.78	28.10
Peppers	216.07	223.33	183.00	177.92	151.48	127.08	72.42	79.95	72.14
Tomatoes	261.37	240.48	228.63	260.94	240.73	230.87	90.15	109.42	87.43
Onion	268.31	224.09	254.90	126.63	114.40	143.67	144.03	60.26	60.96
Head lettuces	16.36	18.67	15.73	12.27	10.42	13.05	8.42	12.04	10.15
Peas	5.04	3.59	43.15	2.86	2.86	1.04	-	-	51.61
Sweet corn	13.90	11.31	12.37	7.96	8.17	4.10	-	11.70	31.90
Total	2,020.00	1,708.38	1,598.00	1,211.64	1,161.70	1,035.71	705.04	700.46	782.42

Table 3 Harvested area of most grown species of vegetables in the district of Levice in ha

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	69.36	109.47	-	13.83	39.87	14.79	-	6.08	6.70
Carrots	26.36	85.40	64.65	17.81	27.86	8.96	12.37	5.47	21.23
Parsley and parsnips	27.69	12.90	17.18	9.68	19.13	9.38	9.92	5.35	29.75
Gherkins	242.91	140.52	77.04	99.03	93.03	50.25	41.22	34.16	33.90
Cucumbers	5.43	17.61	8.12	4.36	3.46	0.49	2.10	2.00	2.00
Peppers	193.97	169.56	105.90	100.73	84.69	63.63	19.69	17.59	19.87
Tomatoes	363.87	263.05	269.33	165.56	217.54	96.29	39.66	17.75	38.85
Onion	89.20	60.79	108.77	60.90	59.70	28.98	55.74	42.68	57.64
Peas	51.25	108.54	250.08	235.40	1.98	-	-	-	347.85
Sweet corn	268.85	284.25	242.58	161.14	70.67	347.77	370.40	215.50	204.74
Pumkin	-	62.00	30.89	-	66.51	56.29	55.03	72.80	73.86
Total	1,606.04	1,449.07	1,313.48	998.98	757.06	797.45	788.21	809.12	937.31

Table 4 Harvested area of most grown species of vegetables in the district of Nitra in ha

Vegetables	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	55.00	75.70	38.04	39.38	30.96	48.25	23.38	47.30
Cauliflower	14.02	13.24	13.32	24.08	12.65	9.50	8.58	7.30
Carrots	4.99	4.60	3.72	3.82	2.69	21.12	7.60	7.60
Gherkins	19.60	20.33	23.59	28.32	15.54	14.40	15.60	15.27
Cucumbers	2.37	2.63	2.34	2.59	2.14	5.00	5.00	5.00
Watermelon	10.27	7.17	12.29	4.83	8.65	6.20	5.96	2.00
Peppers	8.63	15.17	17.88	20.53	15.77	-	22.15	-
Tomatoes	8.84	14.61	12.90	11.36	13.33	18.26	18.05	13.55
Onion	165.10	40.40	61.60	57.10	121.20	138.70	144.00	86.10
Head lettuces	1.10	0.53	1.84	3.43	0.79	1.00	1.10	1.80
Sweet corn	34.71	33.27	27.50	1.50	1.51	4.46	4.80	5.00
Pumkin	57.55	182.25	376.53	255.45	283.54	218.99	236.74	464.05
Total	270.83	424.59	565.32	433.54	406.58	380.50	356.79	593.51

Table 5 Harvested area of most grown species of vegetables in the district of Nové Zámky in ha

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	74.60	58.86	80.91	43.71	75.26	63.01	-	40.95	35.40
Cauliflower	110.36	133.57	117.57	114.89	135.55	81.59	67.69	55.93	116.24
Carrots	24.52	45.09	17.56	9.72	14.85	12.59	9.76	10.51	10.31
Parsley and parsnips	18.35	15.61	14.59	6.31	9.61	12.90	7.40	13.00	13.65
Gherkins	36.54	14.31	17.38	15.44	20.35	11.96	14.17	15.32	10.60
Cucumbers	13.48	6.47	10.46	12.39	9.92	13.37	11.91	11.51	10.11
Watermelon	74.61	72.15	104.10	73.93	60.27	58.94	38.11	50.77	35.33
Peppers	63.39	57.59	40.17	44.75	50.31	44.53	40.58	41.38	40.80
Tomatoes	605.77	620.62	582.77	550.14	507.54	538.46	550.05	542.13	336.84
Onion	20.34	46.95	57.91	8.53	15.47	18.32	22.16	32.51	43.20
Garlic	14.89	13.36	17.65	17.63	16.63	16.50	16.10	14.58	14.57
Sweet corn	4.36	13.04	7.92	3.15	2.22	4.75	7.75	6.06	26.52
Pumkin	-	15.24	12.17	21.38	21.00	49.24	8.38	7.33	12.82
Total	1,215.07	1,274.70	1,285.42	1,048.63	1,035.71	1,006.69	896.45	875.80	783.73

Table 6 Production volume of most grown species of vegetables in the district of Komárno in t

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	4,642.30	6,730.40	5,361.30	1,299.50	85.47	1,199.70	989.50	794.80	450.50
Cauliflower	397.70	329.60	583.30	387.10	511.00	306.00	191.80	190.20	117.60
Savoy cabbage	485.40	587.10	505.90	237.20	467.90	239.00	124.20	336.70	158.50
Kohlrabi	629.00	901.30	557.80	554.30	543.60	271.60	71.70	208.29	165.40
Carrots	4,106.30	2,044.60	2,544.60	1,733.50	1,621.80	1,470.10	1,491.80	1,202.60	632.70
Parsley and parsnips	2,941.90	783.50	2,444.60	1,786.00	1,780.00	726.60	2,250.30	1,069.90	1,026.80
Cucumbers	683.60	939.70	974.90	2,073.10	2,306.70	995.40	229.10	355.9	201.00
Watermelon	2,296.40	3,428.10	1,799.60	2,103.00	619.80	777.30	753.70	542.90	52.30
Peppers	2,914.40	3,120.90	2,273.70	2,998.40	2,566.90	2,244.40	1,368.30	1,591.40	629.10
Tomatoes	7,291.60	6,262.50	5,108.20	7,034.90	6,428.60	4,634.00	3,569.90	3,722.90	226.30
Onion	3,693.60	1,222.00	4,125.20	963.40	1,412.70	1,647.40	1,770.70	490.00	315.70
Head lettuces	76.80	195.70	233.30	78.30	86.10	86.20	62.30	150.50	93.90
Peas	10.60	14.20	98.10	10.60	10.60	1.00	-	-	85.50
Sweet corn	47.80	8.10	68.30	61.4	27.70	9.70	-	25.70	57.80
Total	32,369.80	28,520.30	29,383.10	23,659.40	22,563.70	15,577.00	13,638.20	11,510.30	4,986.30

Table 7 Production volume of most grown species of vegetables in the district of Levice in t

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	1,327.70	2,634.20	–	251.50	1,037.60	252.70	–	40.60	86.20
Carrots	420.70	2,650.60	1,190.40	647.50	715.20	164.20	274.80	166.00	482.50
Parsley and parsnips	255.50	30.10	125.30	91.50	102.60	47.20	58.60	97.00	126.30
Gherkins	2,130.30	1,549.10	698.40	2,106.10	1,701.60	799.60	340.30	408.20	491.70
Cucumbers	45.10	200.80	95.80	163.90	56.60	12.30	6.40	6.10	120.00
Peppers	1,649.60	1,387.50	1,257.50	1,308.50	1,357.70	964.60	154.70	230.30	105.40
Tomatoes	5,839.40	6,102.20	8,157.20	3,645.70	4,327.20	1,110.60	571.10	167.60	540.10
Onion	1,570.40	420.30	1,702.60	847.60	722.80	233.10	1,373.20	494.00	1,353.60
Peas	191.90	121.50	600.20	913.10	5.4	–	–	–	1,181.40
Sweet corn	2,255.10	2,313.90	1,425.30	803.60	234.70	896.40	3,120.30	1,127.70	2,680.70
Pumkin	–	71.70	146.50	–	248.50	12.30	161.50	130.60	145.10
Total	18,062.90	19,798.20	18,509.80	12,238.80	11,801.90	6,042.70	7,490.80	5,023.20	8,275.20

Table 8 Production volume of most grown species of vegetables in the district of Nitra in t

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	875.00	1,392.20	2,393.90	787.20	942.00	615.00	1,264.50	1,000.80	1,194.80
Cauliflower	75.00	107.20	186.70	160.10	457.60	93.10	81.00	106.80	71.30
Carrots	61.40	36.90	27.20	102.30	70.30	38.90	199.70	193.50	58.30
Gherkins	706.30	524.50	227.90	316.30	472.10	99.00	190.70	105.30	85.90
Cucumbers	20.60	30.30	23.60	39.60	47.70	63.30	236.30	295.50	295.00
Watermelon	88.80	217.90	70.80	249.90	44.70	66.10	61.40	86.30	5.00
Peppers	29.20	141.00	457.90	368.10	620.80	738.70	–	377.30	–
Tomatoes	105.20	272.70	749.80	730.30	859.90	1,196.90	1,488.50	729.30	76.30
Onion	165.10	40.40	61.60	57.10	121.20	138.70	144.00	86.10	–
Head lettuces	–	23.30	5.00	47.20	60.50	1.90	8.50	5.50	21.30
Sweet corn	286.30	267.00	329.70	325.70	6.00	8.90	43.40	29.70	23.00
Pumkin	–	744.20	467.00	4,686.70	378.50	248.30	202.40	296.20	260.50
Total	2,939.30	4,191.60	5,432.50	8,431.00	4,413.70	3,428.60	4,948.80	3,323.80	2,255.80

125 ha. From that time until 2010, the area for many species significantly decreased or ceased to exist (Table 3).

In the district of Nitra, the total acreage of vegetables increased from 271 ha to 594 ha between 2003 and 2010. The increase in growth areas was recorded in pumpkins, cucumbers and carrots. For other species, the growing area varied and in some cases also decreased during those years (Table 4).

The Nové Zámky district is characterized by the production of tomatoes and cauliflowers (Table 5). In 2002, tomatoes were grown on 606 hectares and in 2010 on the area of 337 ha. Cauliflower areas reached their maximum in 2006 (136 ha), whereas the minimum in 2009 (Ďurovičová et al, 2003).

The production of vegetables

In the past, the district of Komárno ranked first in production of vegetables in the Nitra region. In 2002, the district

produced a total of 32,370 t of vegetables, but by 2010, this amount dropped to 4,538 t (Rakovská et al., 2009). Most of the production represented tomatoes (7,291 t), but in 2010, their production was only 226 t. Similarly, the production of white cabbage, carrots, onions, parsley, peppers and watermelons decreased (Table 6).

The total production of vegetables in the district of Levice decreased between 2002 and 2010 from 18,063 t to 8,275 t. Similar pattern was also observed for other types of vegetables. Currently, the production of sweet corn (2,681 tons) and onion (1,354 t) dominate. The production of tomatoes, gherkins and carrots reach about 500 t each (Table 7).

In the district of Nitra, the production of white cabbage (1,195 t), cucumbers (295 t) and pumpkins (261 t) prevailed in 2010. The critical decline in production was recorded in gherkins and sweet corn. Conversely, a significant increase occurred in cucumbers (Table 8). The overall decline for all

Table 9 Production volume of most grown species of vegetables in the district of Nové Zámky (t)

Vegetables	2002	2003	2004	2005	2006	2007	2008	2009	2010
White cabbage	957.60	1,256.00	1,729.40	716.40	1,868.00	1,486.30	-	731.80	333.30
Cauliflower	679.40	1,592.00	161.50	1,001.40	1,130.60	1,016.00	572.50	338.80	400.30
Carrots	343.30	788.50	380.00	169.50	412.70	181.10	158.20	197.60	112.00
Parsley and parsnips	70.90	68.10	90.10	58.20	71.70	38.70	21.90	198.50	62.60
Gherkins	408.40	172.90	187.70	285.60	418.50	76.90	126.70	202.50	56.80
Cucumbers	352.20	282.70	579.10	464.10	107.50	454.90	1,265.80	1,116.10	892.40
Watermelon	492.40	1,445.10	928.50	1,108.30	732.20	743.90	200.10	213.80	144.00
Peppers	513.90	379.60	356.40	498.00	566.10	437.80	353.50	386.60	188.10
Tomatoes	13,087.30	8,493.70	16,037.80	14,839.80	15,833.00	14,698.30	18,867.90	15,345.20	4,450.60
Onion	241.20	305.30	596.80	111.30	147.30	147.90	288.40	318.10	142.40
Garlic	73.70	66.20	53.00	52.90	54.90	65.90	51.90	46.20	78.30
Sweet corn	26.70	73.20	57.70	14.80	13.70	18.30	45.00	34.40	96.30
Pumkin	-	54.00	15.80	28.20	30.30	26.20	6.60	14.90	44.10
Total	18,147.00	16,023.90	23,889.40	20,233.60	21,919.50	19,750.30	23,752.10	19,525.90	7,261.50

over the vegetable production represents 23% (Valšíková and Ryban, 2012).

The production of vegetables in the district of Nové Zámky visibly changed between 2002 and 2009. In 2010, the harvest was lower by 63% compared to the previous year. This decrease was mainly caused by a dramatic fall in production of tomatoes and cabbage to one-third (Table 9).

Summary

The Nitra Region is the most productive area in terms of vegetable production in Slovakia. Vegetables are grown at the largest area of arable land (937 ha) in the district of Levice. Vegetables in the districts of Komárno and Nové Zámky were planted on the area of 780 ha. The smallest size of vegetable areas was recorded in the districts of Topoľčany and Zlaté Moravce. The greatest volume of vegetables was produced in the district of Levice (7,343 t) and Nové Zámky (7,114 t). Less vegetables were produced in the districts of Komárno (4,538 t), Šaľa (2,775 t) and Nitra (2,091 t). When comparing the vegetable production between 2002 and 2010, it can be concluded that it declined in all districts. Among the most grown vegetables we can include cabbage, carrot, parsley, onion, tomato, pepper, watermelon and sweet corn.

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