

PRODUCTIONAL CHARACTERISTICS OF SOME ORIENTAL VARIETIES OF BASMAK TOBACCO

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ABSTRACT

Basmak tobacco is included in Macedonian production of oriental tobacco. This type is distinguished by its high quality raw material, typical for the oriental tobaccos, and is highly demanded in world market. Field trials were conducted in Scientific Tobacco Institute - Prilep from 2009 to 2011 with YK 7 - 4/2 as a check (ø) and three Basmak varieties MK-1, MB-2 and MB-3. The highest values for dry tobacco yield per stalk and per unit area were recorded in MB-3 variety (11.60 g/stalk and 2140 kg/ha). The Basmak varieties showed higher average purchase price and yield per hectare compared to the check. They also achieved higher gross income, the highest value of which was recorded in MB-3 variety (336 075 denars/ha).

The aim of the paper is to give a complete view on productional characteristics of investigated Basmak varieties and to enable their easier implementation in mass production of this tobacco type.

Keywords: tobacco, variety, Basmak, yield, gross income

ПРОИЗВОДНИ СВОЈСТВА НА НЕКОИ ОРИЕНТАЛСКИ СОРТИ ОД ТИПОТ БАСМАК

Во вкупното произботство на ориенталски тип тутун во Македонија регистрирано е и производство на типот басмак. Суровината од овој тип тутун е со висок квалитет, карактеристична за ароматичен ориенталски тип тутун, кој како таков е доста баран на странскиот пазар. При Научниот институт за тутун – Прилеп од 2009 до 2011 година беше поставен опит каде беа вклучени 4 сорти, и тоа: JK 7 - 4/2 како контрола (ø), и басменските сорти МК – 1, МБ – 2 и МБ – 3. Приносот на сув тутун по страк и единица површина највисок е кај сортата МБ-3 (11,60 g/страк и 2140 kg/ha). Повисоката просечна откупна цена и принос по хектар кај басменските сорти во споредба со контролата покажаа и повисок бруто паричен приход, кој е највисок кај сортата МБ-3 (336 075 ден./ha).

Целта на овој труд беше да се даде комплетна слика за производните својства на испитуваните басменски сорти, а со тоа да се овозможи нивна полесна имплементација во производство на овој тип тутун.

Клучни зборови: тутун, сорта, басмак, приноси, бруто паричен приход.

INTRODUCTION

Yield and quality of the obtained raw from Basmak tobacco meet the criteria and

quality standards of many manufacturers and tobacco purchase companies from these

areas. The taste of smokers is changing and so are the requirements of manufacturers for particular components of oriental tobacco raw used in fabrication of blend cigarettes. Therefore, each year the foreign buyers are offered different types and varieties to meet the requirements in terms of aroma, taste and other tobacco characteristics. Basma is well known and highly appreciated oriental tobacco, primarily grown in Greece and Turkey. However, after the dramatic decline in production of this tobacco in these two countries (especially in Greece), tobacco companies see a possibility to shift a part of this production in the Republic

of Macedonia, in areas with favorable soil and climate conditions. In order to make this production more attractive to manufacturers, the purchase price for this tobacco is somewhat higher compared to other oriental tobaccos. The fact that there are practically no problems with exports of Basma tobacco raw is additional motif for production of newly created varieties of this type that will be interesting for farmers, processors, manufacturers, wholesalers etc. The most similar to Basma tobacco by its morphological characteristics is the check variety YK 7-4/2.

MATERIAL AND METHODS

Investigations were carried out in 2009, 2010 and 2011 with the standard variety YK 7-4/2 as a check (Ø) and three Basma varieties (MK-1, MB-2 and MB-3).

The seedling was produced in traditional way at the field of Scientific Tobacco Institute - Prilep, in cold beds covered with polyethylene. The trials were performed with 5 g seed/10 m², applying all necessary cultural practices and protective measures. After one autumn and two spring ploughings of soil, the trial was set up in randomized blocks with 5 replicates, at 45 × 12 cm planting density on previously prepared soil. The area of the main plot was 9 m² and the useful plot area was 6.16 m². The number of rows in each plot was 5 (3

were used for harvest and 2 as protective shield). The number of plants in a row was 42 (38 stalks for harvest and 4 protective). Harvesting and stringing of leaves were performed manually in 7 primings in the stage of technical maturity, followed by sun-curing on horizontal frames. Qualitative assessment of cured tobacco after ironing was done according to the "Criteria for qualitative and quantitative assessment of raw tobacco leaf" (Official Gazette of the Republic of Macedonia, February 12, 2007). Corrected yield per stalk and hectare, the average price for 1 kg dry tobacco and gross income were statistically processed by analysis of variance and tested with LSD method (Najceska, 2002).

RESULTS AND DISKUSSION

Dry tobacco yield per stalk and per unit area

Dry tobacco yield per stalk depends on genetic potential of the variety, soil and climate conditions and applied agricultural practices. The yield per hectare is closely related to the yield per stalk and, along with quality, it is a visual indicator for assessment of economic value of the variety.

Results of the three year-investigations (Table 1, Figure 1) reveal that the yield ranges from 7.01 g/stalk in YK 7-4/2 (Ø) in 2011 to 11.98 g/stalk in MB-3 variety in 2010. Compared to the check, highly significant difference of 1 % was observed in MB-3 (2009, 2010 and 2011), MK-1

and MB-2 (2010 and 2011). In 2009, no significant difference was observed in variety MB-2, whereas MK-1 showed significant difference at 5 % level.

The average yield in the investigation period ranged from 7.77 g/stalk in YK 7-4/2 (Ø) to 11.60 g/stalk in MB-3 and, expressed in percentage, it was 50.08 % higher compared to the check. Bogdanceski et al., (1991) reported a yield of 9.8 g/stalk or 1959 kg/ha. Data for the yield per hectare (Table 2, Figure 2) reveal the lowest value in the check YK 7-4/2 (1294 kg/ha) in 2011, and the highest in MB- 3 variety (2210 kg/ha) in 2010. High significant difference of 1 % compared to the check was recorded in varieties MB-3 in 2009, 2010 and 2011 and in MK-1 and MB-2 in 2010 and 2011. In 2009, significant difference of 5 % was recorded in MK-1 variety, and the variety

MB-2 showed no such difference. The average yield per hectare for the three years of investigation ranged from 1433 kg/ha in YK 7-4/2 (Ø) to 2 140 kg/ha in MB-3, which is 49.34 % higher than the check. Basma varieties are characterized by lower yields. (Nuneski, 2008), reported that the yield in variety Izmir Basma (Turkey) ranges from 600 to 1000 kg/ha. Dimov, (2011) stated that the yield of Djebel Basma , Djebel Basma 12 and Djebel Basma 13 varied from 1600 to 1900 kg/ha, depending on the agroclimatic conditions and applied cultural practices. Comparison between yields (g/stalk and kg/ha) obtained in our investigation and the available literature data reveals that the region of Prilep has suitable soil and climate conditions for production of Basma tobacco.

Table 1. Tobacco yield in g/stalk

Variety	Year	Yield, g/stalk	Difference		Average, 2009-2011	Difference 2009-2011		Rank
			Absolute	Relative		Absolute	Relative	
YK 7-4/2 Ø	2009	8.07	/	100.00	7.77	/	100.00	4
	2010	8.22	/	100.00				
	2011	7.01	/	100.00				
MK-1	2009	9.99 ⁺	+ 1.92	123.69	9.55	+ 1.78	122.84	2
	2010	10.11 ⁺⁺	+ 1.89	122.99				
	2011	8.54 ⁺⁺	+ 1.53	121.83				
MB-2	2009	9.06	+ 0.99	112.35	9.12	+ 1.35	117.99	3
	2010	9.39 ⁺⁺	+ 1.17	114.23				
	2011	8.93 ⁺⁺	+ 1.93	127.39				
MB-3	2009	11.10 ⁺⁺	+ 3.03	137.45	11.60	+ 3.83	150.08	1
	2010	11.98 ⁺⁺	+ 3.76	145.74				
	2011	11.71 ⁺⁺	+ 4.71	167.05				

2009 yield, LSD 5% = 1,76 +
1% = 2,48 ++

2010 yield, LSD 5% = 0,55 +
1% = 0,78 ++

2011 yield, LSD 5% = 0,71 +
1% = 1,00 ++

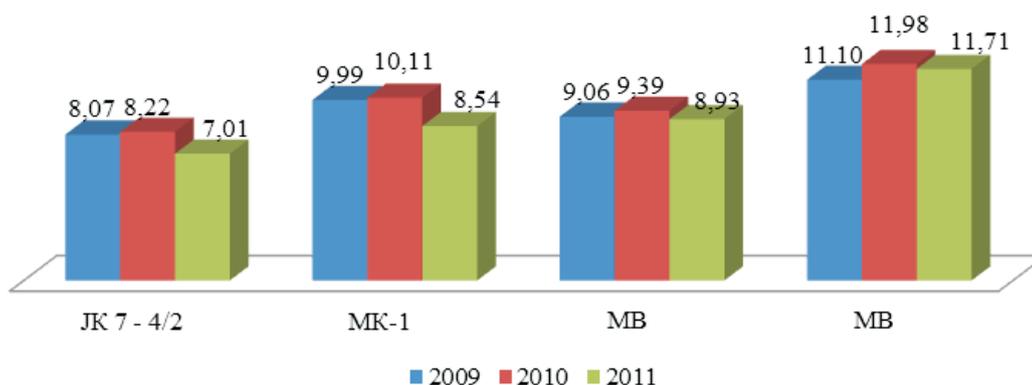


Figure 1 – Dry tobacco yield, g/stalk

Table 2. Dry tobacco yield, kg/ha

Variety	Year	Yield, g/ stalk	Difference		Average, 2009-2011	Difference 2009-2011		Rank
			Absolute	Relative		Absolute	Relative	
YK 7-4/2 Ø	2009	1490	/	100.00	1433	/	100.00	4
	2010	1515	/	100.00				
	2011	1294	/	100.00				
MK-1	2009	1843 ⁺	+ 352.40	123.69	1761	+328	122.89	2
	2010	1864 ⁺⁺	+ 349.00	123.04				
	2011	1576 ⁺⁺	+ 282.00	121.79				
MB-2	2009	1674	+ 183.20	112.35	1684	+251	117.51	3
	2010	1732 ⁺⁺	+ 217.00	114.32				
	2011	1647 ⁺⁺	+ 353.00	127.28				
MB-3	2009	2048 ⁺⁺	+ 557.20	137.45	2140	+707	149.34	1
	2010	2210 ⁺⁺	+ 695.00	145.87				
	2011	2161 ⁺⁺	+ 867.00	167.00				
2009 yield, LSD 5% = 325.31 ⁺ 1% = 457.23 ⁺⁺			2010 yield, LSD 5% = 100.54 ⁺ 1% = 141.31 ⁺⁺		2011 yield, LSD 5% = 130.77 ⁺ 1% = 183.81 ⁺⁺			

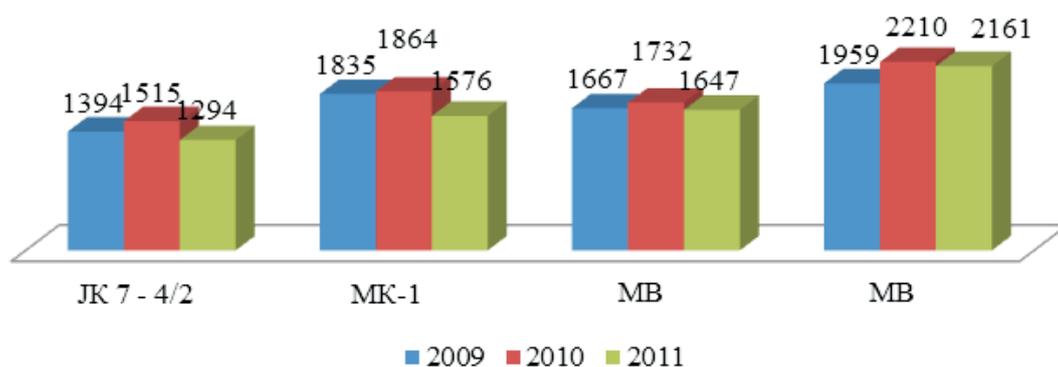


Figure 2 - Dry tobacco yield, kg/ha

Average purchase price

The average purchase price is one of the important indicators of tobacco quality, expressed in monetary value for purchased kg of tobacco. Principal role in formation of this category have the grades of tobacco and their percentage.

According to the data from Table 3 and Figure 3, the lowest average price of 100.03 denars/kg was recorded in YK 7-4/2 (Ø) in 2011 and the highest - 178.42 denars/kg - in Basma variety MK-1 in 2010, which is 76.69 % higher than the check. Compared to YK 7-4/2, highly significant difference of 1 % was estimated in the newly created Basma varieties MK-1, MB-2 and MB-3 during the three years of investigation.

Average price of the varieties included in the trial ranged from 107.40 denars/kg in

YK 7-4/2 to 168.45 denars/kg in MK-1, which relative difference is 56.84 % higher compared to the check. The average price in other varieties ranges from 157.06 to 163.54 denars/kg in MB-3 and MB-2, respectively.

According to the results, the investigated Basma varieties have a high percentage of higher graded - tobacco raw compared to the check variety Yaka, as a result of which they achieve higher price per kg purchased tobacco.

Bogdanceski et al.,(1997) reported that average price of the standard variety YK 7-4/2 in the region of Strumica was 38.04 denars/kg. The average price of the newly created Basmak varieties is higher, due to the improved quality.

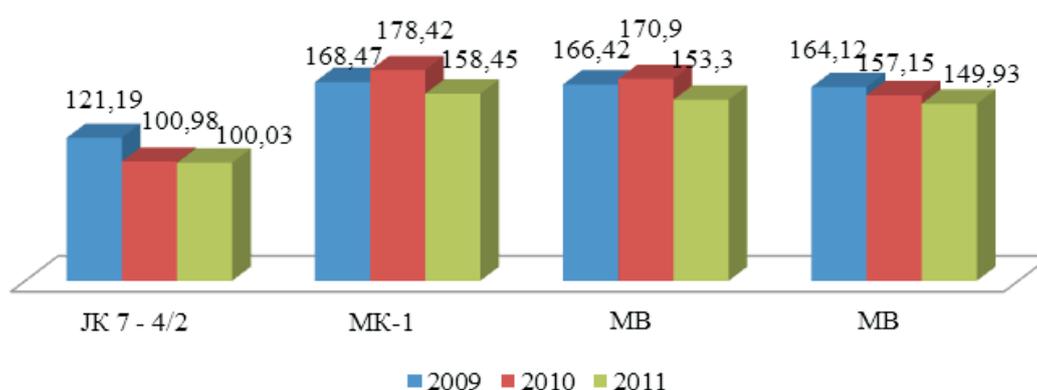
Table 3. Average price, denars/kg

Variety	Year	Average price, denars/kg	Difference		Average price, 2009-2011	Difference, 2009-2011		Rank
			Absolute	Relative		Absolute	Relative	
JK 7-4/2 Ø	2009	121.19	/	100.00	107.40	/	100.00	4
	2010	100.98	/	100.00				
	2011	100.03	/	100.00				
MK-1	2009	168.47 ⁺⁺	+ 47.28	139.01	168.45	+ 61.05	156.84	1
	2010	178.42 ⁺⁺	+ 77.44	176.69				
	2011	158.45 ⁺⁺	+ 58.42	158.40				
MB-2	2009	166.42 ⁺⁺	+ 45.23	137.32	163.54	+ 54.16	152.27	2
	2010	170.90 ⁺⁺	+ 69.92	169.24				
	2011	153.30 ⁺⁺	+ 53.27	152.84				
MB-3	2009	164.12 ⁺⁺	+ 42.93	135.42	157.07	+ 49.67	146.25	3
	2010	157.15 ⁺⁺	+ 56.17	155.62				
	2011	149.93 ⁺⁺	+ 49.90	149.88				

2009 yield, LSD 5% = 9.07⁺
1% = 12.75⁺⁺

2010 yield, LSD 5% = 11.99⁺
1% = 16.85⁺⁺

2011 yield, LSD 5% = 10.95⁺
1% = 15.39⁺⁺



**Figure 3 – Average price, denars/kg
Gross income per unit area**

Gross income per unit area actually synthesizes the results for yield and quality of tobacco, expressed through the percentage of high grades and average price (denars/ha). According to the results presented in Table 4 and Figure 4, the gross income of varieties included in the trial varies from 129.598 denars/ha in the check YK 7-4/2 (2011) to 347.119 denars/ha in the variety MB-3 (2010). In relation to average price, it varies from 151.618 denars/ha in YK 7-4/2 to 336.075 denars/ha in MB-3, which is 121.66 % higher compared to the check. It should be noted that key factor in

the formation of gross income of the variety MB-3 was the high yield per hectare. MK-1 and MB-2 varieties had higher yields compared to the check, achieving 81.83 % and 96.30% higher gross income, respectively. According to (Bogdanceski et al., 1997), the gross income of Yaka tobacco in the Strumica region ranged from 64,619 to 106,484 denars/ha in varieties YK 7-4/2 (ø) and Yaka 23, respectively. It is interesting to remark that all varieties included in the three years-investigation achieved high significant difference of 1 % compared to the check.

Table 4. Gross income, denars/ha

Variety	Year	Gross income, denars/ha	Difference		Average	Difference		Rank
			Absolute	Relative		Absolute	Relative	
YK 7-4/2 Ø	2009	181 121	/	100.00	151 618	/	100.00	4
	2010	153 134	/	100.00				
	2011	129 598	/	100.00				
MK-1	2009	310 703 ⁺⁺	+ 129 582	171.55	297 627	146 009	196.30	2
	2010	332 504 ⁺⁺	+ 179 370	217.13				
	2011	249 674 ⁺⁺	+ 120 076	192.65				
MB-2	2009	278 499 ⁺⁺	+ 97 378	180.35	275 683	124 067	181.83	3
	2010	296 096 ⁺⁺	+ 142 962	193.36				
	2011	252 454 ⁺⁺	+ 122 856	194.80				
MB-3	2009	336 992 ⁺⁺	+ 155 581	213.21	336 075	184 557	221.66	1
	2010	347 119 ⁺⁺	+ 193 984	226.68				
	2011	324 115 ⁺⁺	+ 194 517	253.95				

2009 yield, LSD 5% = 64 210 +
1% = 90 248 ++

2010 yield, LSD 5% = 25 328 +
1% = 35 599 ++

2011 yield, LSD 5% = 30 414 +
1% = 42 748 ++

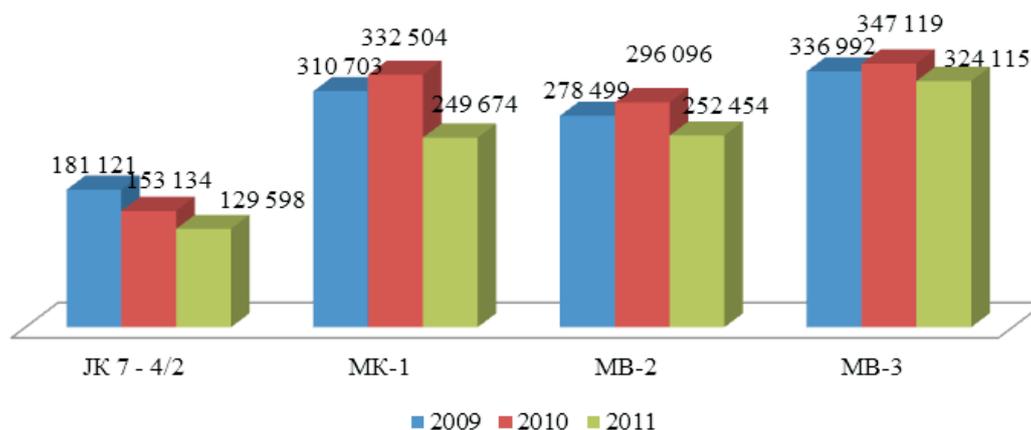


Figure 4 - Gross cash income, denars/ha

CONCLUSIONS

Based on results of the three year-investigations, the following conclusions can be made:

- Dry tobacco yield was the lowest in the check variety YK 7-4/2, amounting 7.77 g/stalk and 1433 kg/ha, while Basma variety MB-3 had the highest yield of 11.60 g/stalk and 2140 kg/ha. Expressed in percentage, MB-3 achieved 50.80 % higher yield per stalk and 49.34 % higher yield per hectare compared to the check.

Compared to the check dry tobacco yield was the lowest in the check, highly significant difference of 1 % was observed in MB-3 (2009, 2010 and 2011), MK-1 and MB-2 (2010 and 2011). In 2009, no significant difference was observed in variety MB-2, whereas MK-1 showed significant difference at 5 % level.

-The lowest purchase price of tobacco was recorded in the check YK 7-4/2 (107.40 denars/kg). Basma varieties achieved higher purchase price (157.07 denars/kg in MB-3 to 168.45 denars/kg in MK-1). Compared to YK 7-4/2, highly significant difference of 1 % was estimated in the newly created Basma varieties MK-1, MB-2 and MB-3 during the three years of investigation.

- Gross income was the lowest in YK 7-4/2 (151.618 denars/ha) and the highest values were achieved in MB-3 variety (336.075 denars/ha), which is 221.66 % higher than the check variety.

It is interesting to remark that all varieties included in the three years-investigation achieved high significant difference of 1 % compared to the check.

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