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Professional paper

EVALUATION OF GROSS MONETARY INCOME FOR RECOGNIZED VARIETIES OF THE PRILEP TOBACCO TYPE IN THE 2023 HARVEST

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Abstract

The trials were conducted at the experimental field of the Scientific Tobacco Institute – Prilep during the 2023 growing season. Eight recognized varieties of the Prilep type were planted: P 10 3/2 (control), NS 72, Prilep 79-94, Prilep 26, Prilep 123/7, P 66 9, P 76/86 and P 90.
The trial was set up using the randomized block design with three replications. Harvested tobacco was evaluated in accordance with the current Rulebook for the purchase of unprocessed oriental aromatic tobacco leaves ("Official Gazette of the Republic of North Macedonia", No. 250/2021). In parallel with these trials, gross monetary income was also calculated based on evaluation of tobacco as if sold only in first class (353.65 MKD/kg), which was the case during the 2023 harvest. Therefore, the aim of this research was to compare gross monetary income (MKD/ha)) when assessing tobacco by classes (I, II and III class) with the purchase of tobacco only in the first class, where the purchase price for all classes was 353.65 MKD.
Gross monetary income per unit area essentially represents a synthesis of yield and quality results, shown through the percentage of high-quality classes and the average price (MKD/ha). Data on average price (MKD/kg) and gross monetary income (MKD/ha) were statistically processed using the method of analysis of variance and the LSD test.
According to the results obtained from the tested varieties that were grown in the same soil and climatic conditions, the gross monetary income of the P 66 9 varieties, when assessed by classes (I, II and III class), averages 919 070 MKD/ha, while when assessed only in the first class, it would amount to 1 112 229 MKD /ha. Among the tested varieties, the variety P 90 also stood out, with an average gross income of 860 333 MKD/ha when evaluated by class, and 1 008 963 MKD/ha if evaluated only as first class. Variety P 90, when evaluated by class according to the valid Rulebook, demonstrated good quality and a higher average price of 301.6 MKD/kg.
From a practical standpoint, these results can serve as useful guidance for primary producers when selecting tobacco varieties in the future.

Keywords: tobacco, variety, gross income, average price

1. Introduction

The yield and quality of raw tobacco obtained from oriental aromatic tobaccos meet the criteria and quality standards of many companies involved in cigarette manufacturing and of those that purchase tobacco from this region.
As a result of good yields, a higher gross monetary income per hectare (MKD/ha) is achieved. In addition to the existing regulation for the procurement of unprocessed oriental aromatic tobacco in three main purchase classes and one additional class, in 2023, due to lower production of raw oriental-type tobacco, nearly all of it was purchased as first-class. This interest from tobacco companies arises because the specific aroma and flavor characteristics of Prilep-type tobaccos satisfy the requirements of manufacturers for oriental-type raw tobacco

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used in cigarette blends. For these reasons, each year foreign buyers are offered raw material from various types, i.e., varieties, to meet their needs in terms of aroma, flavor and other properties of the tobacco. Oriental tobaccos of the Prilep type are considered some of the highest-quality and most highly valued oriental tobaccos in the world. Currently, their production in the Republic of North Macedonia is composed of about 98% from the variety P 66 9 and about 2% varieties from the Yaka-type. Following the significant decline in oriental-type tobacco production in Greece, Bulgaria and Turkey, this type of tobacco is still being intensively cultivated in our country. Due to the drop in production in these countries (especially in Greece), tobacco companies see an opportunity to redirect part of their production to our country, where favorable soil and climate conditions exist.
To make this production more attractive to growers, in 2023 the raw tobacco was purchased almost entirely as first-class, and a subsidy of 100 MKD per kilogram was provided. There are no issues with the export of high-quality raw material from these tobaccos, which encourages the introduction of other varieties of this type that are of interest to both producers and processors, i.e., manufacturers, traders and others.

2. Materials and methods

The research was conducted in 2023 at the experimental field of the Scientific Tobacco Institute – Prilep, where eight officially recognized varieties of the Prilep tobacco type were planted: P 10-3/2 (control), NS 72, Prilep 79-94, Prilep 26, Prilep 123/7, P 66-9, P 76/86, and P 90. The control variety used was P 10-3/2. The soil at the experimental site was of colluvial–alluvial type. Autumn plowing was carried out to a depth of approximately 40 cm. Before the spring plowing, the soil was fertilized with 250 kg/ha of NPK in a ratio of 8:22:20. The trial was arranged in three replications using a Randomized Block Design with a planting density of 45×15 cm. The tobacco crop was cultivated twice and fertilized with 5 grams of 26% KAN per plant. During the growing season, several additional irrigations were applied as needed. After harvesting, the tobacco leaves were strung, yellowed, and sun-cured in traditional curing facilities. The qualitative evaluation of the cured tobacco was performed in accordance with the Regulation on uniform criteria for the evaluation of raw leaf tobacco quality of the oriental aromatic type. Corrected yield per plant and per hectare was calculated using Rimker's method. The gross monetary income (MKD/ha) for each variety was determined by multiplying the yield per hectare by the average purchase price per kilogram of raw tobacco.
This paper presents the gross monetary income based on two scenarios: a realistic evaluation according to the official classing regulation, and an evaluation based solely on first-class classification, as was the case with raw tobacco procurement in 2023. A portion of the data was statistically processed using the Analysis of Variance method according to Najcheska (2002), Filiposki (2011).

3. Results and discussion

– Average purchase price (MKD/kg)
The average purchase price is one of the key indicators of tobacco quality and is expressed in monetary value per kilogram of purchased tobacco (in MKD). This value is primarily determined by the distribution of the tobacco across different quality classes.
According to the data presented in Table 1, the lowest average price of 150.6 MKD/kg was recorded for the control variety P 10-3/2. In contrast, the highest average purchase price was recorded for the variety Prilep 123/7, 301.8 MKD/kg—an increase of 100.40% compared to the control. A nearly identical average price was observed for the variety P 90 (301.6 MKD/kg),

representing a 100.27% increase over the control. All tested varieties showed a highly significant difference (at the 1% level) when compared to the control.
From the data obtained, it can be concluded that the tested tobacco varieties, in comparison to the control variety P 10-3/2, had a higher proportion of higher-quality classed, which directly contributed to the significantly higher average purchase price per kilogram of raw tobacco.

Table 1. Average price according to the Regulation for qualitative evaluation of unprocessed oriental leaf tobacco (Classes I, II and III), MKD/kg, 2023 harvest

Variety	Average	Difference		
		Absolute	Relative	Rank
P 10-3/2	150.6	/	100.00	8
NS 72	282.5**	131.9	187.58	4
Prilep 79-94	266.6**	116.0	177.03	6
Prilep 26	262.4**	111.8	174.24	7
Prilep 123/7	301.8**	151.2	200.40	2
P 66 9	291.5**	140.9	193.56	3
P 76/86	276.7**	126.1	183.73	5
P 90	301.6**	151.0	200.27	1

LSD 0.05% = 62.10 MKD/kg
0.01% = 85.35 MKD/kg

– Gross monetary income (MKD/ha)
Gross monetary income per unit area represents a synthesis of yield and tobacco quality, expressed through the percentage of high-grade classes and the average price in denars per hectare. According to the results presented in Table 2 and Figure 1, the gross monetary income of the varieties included in the trial varied from 227,442 MKD/ha for the control variety P 10-3/2 to 919,070 MKD/ha for the variety P 66 9, which is 304.09% higher than the control.
It should be noted that a key factor contributing to the high gross income of the variety P 66 9 was its high yield per hectare. A similar conclusion can be drawn for the varieties P 90 and Prilep 123/7, which also achieved higher yields compared to the control variety and thus resulted in significantly higher gross income. The relative difference for P 90 was 278.27% higher than the control, while for Prilep 123/7, it was 261.13% higher.
Notably, compared to the control variety P 10-3/2, all tested varieties showed a statistically significant difference at the 1% level. Bogdancheski et al. (1997) reported that in the Strumica production region, the economic effect of the standard variety JK 7-4/2 amounted to 64,619 MKD/ha, while for the variety Jaka 323 it reached up to 106,484 MKD/ha.

Table 2. Gross monetary income (MKD/ha), calculated according to the current regulation for the evaluation of unprocessed oriental leaf tobacco

Variety	Average	Difference		
		Absolute	Relative	Rank
P 10-3/2	227 442		100.00	8
NS 72	787 801**	560 360	346.37	6

Prilep 79-94	793 034**	565 592	348.68	4
Prilep 26	746 588**	519 146	328.25	7
Prilep 123/7	821 361**	593 919	361.13	3
P 66 9	919 070**	691 628	404.09	1
P 76/86	761 847**	534 405	334.96	5
P 90	860 333**	632 891	378.27	2

LSD 0.05%= 296 109 MKD/ ha
0.01% = 409 974 MKD/ha

In the 2023 harvest, according to the valid Regulation for the procurement of unprocessed oriental aromatic leaf tobacco (Official Gazette of the Republic of North Macedonia No. 250/2021), the purchase prices were as follows: Class I: 300.00 MKD/kg, Class II: 240.00 MKD/kg, Class III: 180.00 MKD/kg, additional tobacco II/I: 100.00 den/kg and moldy tobacco: 14.00 den/kg. Due to the lower quantity of unprocessed tobacco in this harvest, purchasing companies bought almost the entire quantity at a fixed price of 353.65 MKD/kg, regardless of class. According to the data from Table 3, the variety P 66 9 achieved the highest gross monetary income, amounting to 1,112,229 MKD/ha, which is 17% higher than the income calculated based on classification (919,070 MKD/ha).
For better clarity and comparison, the gross monetary income under this scenario is illustrated in Figure 1.

Table 3. Gross monetary income (MKD/ha) based on tobacco leaf purchase at a single price (353.65 MKD/kg, first class only)

Variety	Average	Difference		
		Absolute	Relative	Rank
P 10-3/2	535 780	z/	100.00	8
NS 72	986 684	450 904	184.16	5
Prilep 79-94	1 055 292	519 512	196.96	2
Prilep 26	1 005 781	470 001	187.72	4
Prilep 123/7	962 282	426 502	179.60	7
P 66 9	1 112 229	576 449	207.59	1
P 76/86	973 952	438 172	181.78	6
P 90	1 008 963	473 183	188.32	3

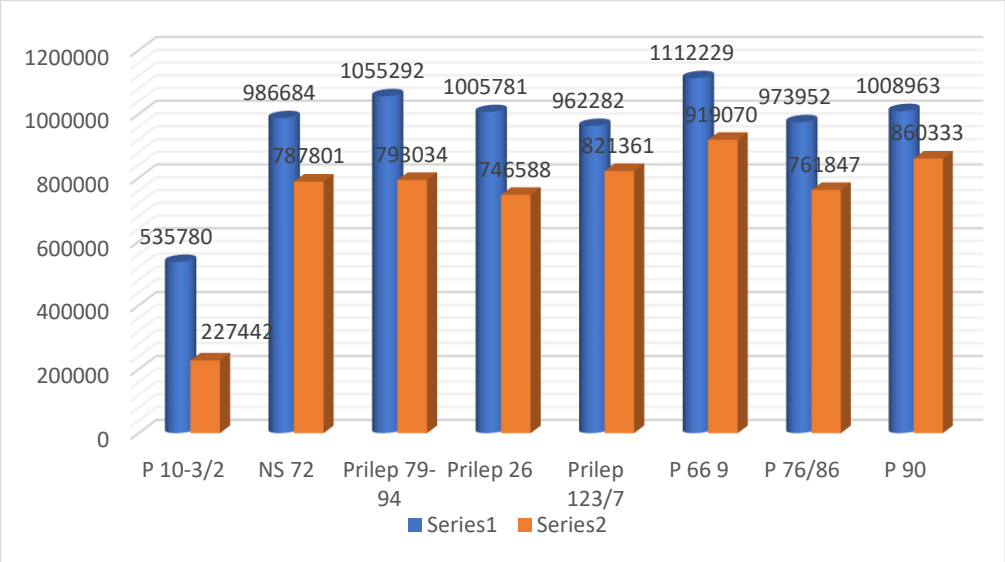

Figure 1. Gross monetary income (MKD/ha)
(Series 1: evaluated only as Class I; Series 2: evaluated by classification)

The Ministry of Agriculture, Forestry and Water Economy has registered the quantities of procured raw leaf tobacco for the 2023 harvest. According to Table 4, it is evident that for the Prilep type, a total of 14,758,868.52 kg/ha of raw leaf tobacco was purchased in Class I out of a total of 14,762,537.40 kg/ha, meaning that only 3,668.88 kg/ha were purchased in the other classes. With an additional subsidy of 100 denars per kilogram, producers of this industrial crop received a significantly higher gross monetary income.

Table 4. ISET data – Final overview of procured raw leaf tobacco from the 2023 harvest, up to 31.03.2024

Class	Tobacco types				Total quantity per class in kg	
	Yaka quantity in kg	Price in MKD/kg	Prilep quantity in kg	Price in MKD/kg		
I-I	132 569.65	345.99	14 626 298.87	353.72	14 758 868.52	
I-II	0.00					
I-II	0.00					
Total aromatic tobaccos in kg	132 569.65		14 629 967.75		14 762 537.40	
Additional tobacco						
II-I	0.00	0.00	29.46	110.00	29.46	
Total additional tobacco in kg	0.00		29.46	110.00	29.46	
Moldy tobacco in kg	0.00	0.00	48.00	14.00	48.00	
	132 569.65		14 630 045.21		14 762 614.86	
Total value of purchased tobacco	5 220 740 699.88					

Average purchase price in MKD/kg	353.65

Data from the Ministry of Agriculture, Forestry and Water Economy

Conclusions

Based on the results of our research, the following conclusions can be drawn:

- The lowest average purchase price of 150.6 MKD/kg was recorded in the control variety P 10-3/2, while the highest average price compared to the control was observed in the variety Prilep 123/7 (301.8 MKD/kg), representing a relative differrence of 100.40%. The variety P 90 also had a significantly higher average price (301.6 MKD/kg), which is 100.27% more than the control.
- The gross monetary income, calculated based on the classification of unprocessed tobacco, varied among the tested varieties. It ranged from 227,442 MKD/ha for the control variety P 10-3/2 to 919,070 MKD/ha for the variety P 66 9, which is 304.09% higher than the control. A key factor in the high gross income of P 66 9 was its high yield per hectare.
- Due to the lower quantity of unprocessed tobacco in 2023, purchasing companies bought almost the entire amount from producers at a uniform price of 353.65 MKD/kg. According to the obtained data, we conclude that the average purchase price for the oriental type P 66 9 was the highest, resulting in a gross monetary income for producers of 1,112,229 MKD/ha, which is 17% more than the gross income calculated by classification (919,070 MKD/ha).
- Based on the data, we conclude that producers in 2023 received almost 17% higher gross profit from the delivered tobacco, along with a subsidy of 100 MKD/kg, confirming that the production of this industrial crop remains attractive for producers in our country.

References

[1]. Atanasov, D. (1972) *Tobacco producing.* ITTI, Plovdiv.

[2]. Bogdancheski, M., Dimitrieski, M. & Miceska, G. (1997) *Production and quality characteristics of some strong-type tobacco varieties in the Strumica region. Tobacco,* 47(1–6), pp. 3–13. Tobacco Institute, Prilep, Republic of Macedonia.

[3]. Bogdancheski, M., Miceska, G., Chavkaroski, D. & Dimitrieski, M. (1991) *Production and qualitative properties of some tobacco varieties in the Prilep tobacco-growing region. Tobacco,* 41(3–4), pp. 97–118. Tobacco Institute, Prilep.

[4]. Dimov, D. (2011) *Debel Basma – a new generation of oriental tobacco ecotype. Tobacco,* 61(7–12), pp. 130–133. University "St. Kliment Ohridski" – Bitola, Scientific Tobacco Institute, Prilep, Republic of Macedonia.

[5]. Filiposki, K. (2011) *Statistical methods in agricultural research – selected chapters.* Prilep.

[6]. Najceska, C. (2002) *Experimental statistics applied in agricultural and biological research.* Skopje: Bona.

[7]. Nuneski, R. (2008) *Study of the technological properties of the Izmir Basma type with reference to the quality traits important for tobacco blends.* Doctoral dissertation, Tobacco Institute, Prilep.