UDC: 633.71-152.61(497.775)
*Professional paper*

# QUANTITATIVE-PHYSICAL TRAITS OF SEMI-ORIENTAL TOBACCO VARIETIES AND LINES

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**Abstract**

Through continuous scientific work and a tradition of 100 years, Scientific Tobacco Institute- Prilep has preserved and developed a large number of oriental, semi-oriental, and large-leaf tobacco varieties. In the Department of Genetics, selection, and seed control, semi-oriental tobacco varieties have been created and preserved, and they remain promising despite the fact that the purchase of this tobacco type is not legally regulated.
In the 2018 harvest, a trial was set up using the Randomized block system method in 4 repetitions with 3 semi-oriental varieties: O 9-18/2 (Ø), O 110-88/3, and O. Zlatovrv, and 3 newly created lines: Maya-96, Maya-94, and Maya-CMS.
Examined semi-oriental tobacco varieties and lines belong to the group of additional types of tobacco characterized by good quantitative and characteristic physical properties. The leaves of the newly created varieties are characterized by a lower percentage of veins, with the lowest percentage found in line Maya-94 (20.09%). They also have a characteristic leaf thickness for this tobacco type. Our goal was to present certain quantitative and physical properties of the tested semi-oriental tobacco varieties and lines that could successfully be included in cigarette blends.
The obtained results show a convincing dominance of variety O. Zlatovrv and lines Maya-96 and Maya-94 over the other varieties included in the study.

## Introduction

In the Department of Genetics, selection and seed control at the Scientific Tobacco Institute-Prilep, existing varieties of various tobacco types have been maintained for many years, and through selection, new superior varieties are obtained, among which are the newly created semi-oriental varieties and tobacco lines.
According to Bograncheski (1981) and Kochoska (2006), semi-oriental tobaccos belong to the group of additional tobacco types, characterized by a low content of veins and good factory yield. With the neutral tobacco raw material for filling, they are close to Virginia tobacco. These tobaccos are sun-cured, so their production is not burdened with energy costs and expensive construction investments. Gornik (1973), Smokvoski (1985) and Uzunoski (1985) indicate that materiality is a variable value depending on the type, variety, insertion, agroecological conditions, technical maturity and after-harvesting conditions.
Given the socioeconomic importance of tobacco in North Macedonia and worldwide, the production of newly created semi-oriental varieties and lines is directed towards achieving higher income per unit area with less labor input, as well as obtaining quality raw materials that will be of interest to the international market and to the producer. The research aimed to evaluate certain quantitative and physical characteristics of semi-oriental varieties and lines, thereby enabling their inclusion in the production of the best-ranked ones.
Among the various local varieties of this tobacco type, the most well-known and widely spread variety was Otlia 9-18/2, which was selected by R. Gornik. Besides this variety, other semi-oriental varieties that are cultivated in Macedonia and recognized by the Variety Commission at the Ministry of Agriculture, forestry, and water economy are Otlia-87, Otlia 110-88/3, Maya-36 and the variety O. Zlatovrv, recognized in 2010.

https://doi.org/10.62792/ut.jasrd.v2.i3-4.p2672

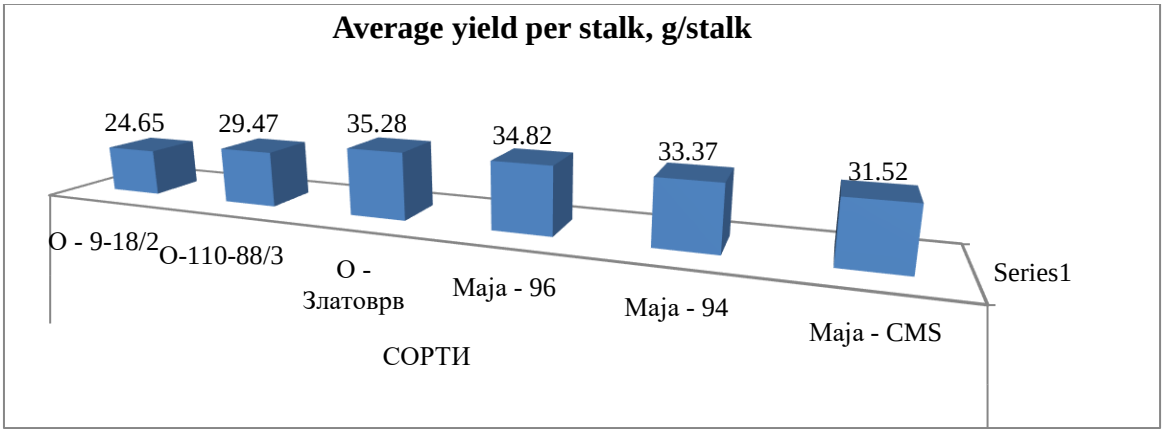
Considering the favorable conditions for the production of this tobacco type in the Republic of North Macedonia, the heterogeneous composition of the soil, relief, and climatic conditions, this type of tobacco, with planned production, can be reintroduced and used as filling tobacco. Dimitrieski (2004) states that the area of distribution of tobacco type or variety is determined within the limits of certain soil-climatic conditions. Only under certain environmental conditions and with the application of necessary modern cultural practices can the maximum biological potential of the type or variety be utilized, and high-quality tobacco raw material recognizable for the given type of product be obtained. Filiposki et al. (1992) state that the soils in the Prilep region covered by the hydro system Prilepsko pole, according to their physical properties, are mainly easy to process and entirely suitable for the production of small-leaf and semi-oriental tobaccos.

## Material and methods

Examinations included 3 semi-oriental varieties: O 9-18/2 (control), O 110-88/3, O. Zlatovrv and 3 newly created lines: Maya-96, Maya-94 and Maya-CMS. Seedling and field production of the mentioned varieties and lines were conducted in the experimental field of STI-Prilep. Seedlings were produced in the usual manner, in cold seedbeds covered with polyethylene fabric in the nursery of the STI-Prilep. Elite seed material from the mentioned varieties and lines was used in the expamination, and the necessary cultural practices were applied to obtain healthy and normally developed seedlings for all three varieties. The required cultural practices were applied, including machine fertilization with NPK (8:22:20) at a rate of 300 kg/ha. The trial was set up using the Randomized block system method in 4 repetitions, and the examinations were conducted using standard methods. Physical properties were determined in the technological laboratory at STI-Prilep using internationally recognized methods.

## Results and discussion

The average yield per stalk is presented in Graph 1. The control variety O 9-18/2 exhibited the lowest yield per stalk (24.65 g/stalk), while the variety O. Zlatovrv showed the highest yield per stalk (35.28 g/stalk).




**Graph 1**

The average yield per hectare is shown in Table 1, ranging from 1972 kg/ha for O 9-18/2 (control) to 2822 kg/ha for O. Zlatovrv, which also has the highest average price per 1 kg, 64.38 MKD.

**Table 1.** Average yield per hectare, kg/ha

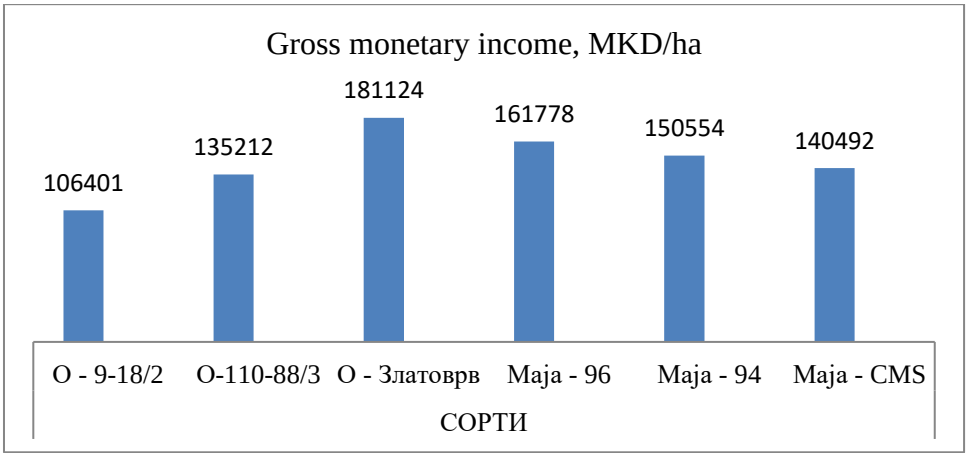
| Variety | Average | Difference from the average | | Range |
|---|---|---|---|---|
| | | Absolute | Relative | |
| O 9-18/2 | 1972 | / | 100,00 | 6 |
| O 110-88/3 | 2362 | + 390,00 | 119,78 | 5 |
| O. Zlatovrv | 2822 | + 850,00 | 143,10 | 1 |
| Maya - 96 | 2785 | + 813,00 | 141,23 | 2 |
| Maya - 94 | 2668 | + 696,00 | 135,29 | 3 |
| Maya - CMS | 2523 | + 551,00 | 127,94 | 4 |

According to the average values during the examination, the average price, as shown in Table 2, ranges from 54.07 MKD/kg for the control variety O 9-18/2 to 64.38 MKD/kg for the variety O. Zlatovrv.

**Table 2.** Average price, MKD/kg

| Variety | Average | Difference from the average | | Range |
|---|---|---|---|---|
| | | Absolute | Relative | |
| O 9-18/2 | 54.07 | / | 100,00 | 6 |
| O 110-88/3 | 57.39 | + 3,32 | 106,14 | 3 |
| O. Zlatovrv | 64.38 | + 10,31 | 119,07 | 1 |
| Maya - 96 | 58.21 | + 4,14 | 107,66 | 2 |
| Maya - 94 | 56.65 | + 2.58 | 104,77 | 4 |
| Maya - CMS | 55.57 | + 1,50 | 102,77 | 5 |

The gross monetary income per hectare, as depicted in Graph 2, is highest for the variety O. Zlatovrv (181,124 MKD/ha) and lowest for the control variety (106,401 MKD/ha). Among the newly obtained lines, we highlight line Maya-96 with 161,778 MKD /kg, which, together with the variety O. Zlatovrv, stands out with a slightly higher gross monetary income per hectare. Lazareski (1983) states that irrigation contributes to an increase in the average price and gross monetary income.




**Graph 2**

**Table 3.** Physical properties

| **Variety** | **Physical properties** | | | |
|---|---|---|---|---|
| | Leaf lamina % | Vein % | Leaf thickness, µm | Substantiality g/m$^2$ |
| O 9-18/2 | 72.86 | 27.14 | 58.33 | 50.66 |
| O 110-88/3 | 76.14 | 23.86 | 58.17 | 47.95 |
| O. Zlatovrv | 76.85 | 22.76 | 64.33 | 53.43 |
| Maya - 96 | 78.07 | 21.93 | 64.17 | 57.90 |
| Maya - 94 | 79.68 | 20.09 | 67.00 | 56.01 |
| Maya - CMS | 77.84 | 22.16 | 66.50 | 52.72 |

Control variety O 9-18/2 is characterized by the lowest participation of leaf lamina (72.86%), while the newly created line Maya-94 has the highest (79.68%). From the data in Table 3, we observe significantly lower vein content in the newly created varieties and lines, especially in the line Maya-94 (20.09%), which is a good physical indicator. The newly tested varieties and lines have characteristic physical properties for the respective type of tobacco and appropriate substantiality for this tobacco type. Substantiality ranges from 50.66 g/m$^2$ for the control variety to 57.90 g/m$^2$ for the Maya-96 line.

Uzunoski (1977) states that substantiality in semi-oriental tobaccos on a true middle leaf ranges from 50.97 g/m$^2$ to 54.30 g/m$^2$, while Chushkaroski (1983) mentions that substantiality in the semi-oriental variety O 9-18/2 is 56.17 g/m$^2$. The newly tested varieties and lines have characteristic physical properties for semi-oriental tobacco types.

## Conclusions

• The newly created variety O. Zlatovrv has the highest average yield per stalk, 35.28 g/stalk, and yield per hectare at 2822 kg/ha, with a relative difference of 43.10% more than the control.

• The average price and gross monetary income per hectare for the newly created variety O. Zlatovrv have a 19.7% higher relative difference compared to the control.
• The newly tested varieties and lines exhibit characteristic physical properties for their respective tobacco type.
• The obtained results demonstrate a convincing dominance of the variety O. Zlatovrv and the line Maya-96 over other varieties included in the trial.

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