

MORPHO-BIOLOGICAL AND TECHNOLOGICAL CHARACTERISTICS OF SOME VARIETY TOBACCO OF THE PRILEP TYPE

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Abstract

The creation and introduction into production of new tobacco genotypes with superior properties in relation to the varieties grown in practice is a permanent task of the selection, which is outlined in the long-term work program of the Department of Genetics and selection at the Scientific Tobacco Institute (Department for oriental tobacco).

Our oriental tobacco is mainly an export-oriented culture and any insufficient attention to the maintenance of varieties and preservation of the variety structure in primary production can have a negative impact with unforeseeable consequences for the tobacco economy.

The promising and commercialized varieties that will be presented in this paper as our creations, largely possess the basic characteristics of the appropriate commodity type, which in turn is due to our scientific work and many years of experience in the field of tobacco selection.

The main purpose of this paper is to present the basic characteristics of some newly recognized promising varieties of tobacco, creations of scientists in NITP, which will serve as a basis for introducing new varieties in the primary production of tobacco, and will also be examined of young agricultural graduates working in tobacco purchasing companies, who are directly involved in the primary production process.

Keywords: *tobacco, oriental, production, varieties*

INTRODUCTION

The degree of expression of the morpho-biological and technological characteristics of a tobacco variety is a result of the interaction of the genotype and the conditions of the external environment in which the plants grow and develop. In order to maintain the long-term biological potential of a tobacco variety with its special previously mentioned characteristics, it is necessary to maintain its phenotypic maintenance, in order to preserve the varietal purity. Phenotypic identification of a certain tobacco variety in relation to other varieties is manifested through its visible morpho-biological characteristics (height of plants, number, dimensions and shape of leaves, shape of inflorescence and color of flowers, length of vegetation period and other biological features). Also, the study of the dependence between the quality of tobacco and its technological characteristics is special importance, because they determine in the first place the so-called technological-commercial quality of leaf tobacco (Uzunoski M.1985). They reflect the structure and chemical composition of the leaf and are closely related with smoking properties of tobacco. In most cases, there is a constant relationship between the chemical composition, the anatomical structure, the numerous external organoleptic properties, and the physical properties of the tobacco leaf, which are widely used in determining the quality of tobacco (Timov and all. 1974).

Having in mind the above-mentioned knowledge, we set ourselves the task in the following text to give a description of some morpho-biological and technological characteristics of several domestic varieties of tobacco of oriental type.

RESULTS AND DISCUSSION

1. Prilep 7

Prilep 7 as a variety was recognized in 1987 (Decision no. 2496 of 02.04.1987, Federal Committee for Agriculture Belgrade, SFRY) was created by hybridization in the Scientific tobacco Institute, Prilep. (Authors: Dr. Milan Bogdančeski, Dr. Mile Uzunoski), (Photo 1).

Morphological characteristics: Plants have conical habitus. The height of the plants is 50 - 80 cm, depending on the growing conditions. The number of leaves varies from 45 to 56 or an average of 50 leaves, which are densely distributed on the stem. The petals in the upper third of the plant are finely compacted. Their shape is elongated ovate, with a sharp tip, weakly expressed nerve and yellow-green color. The average length of the dry leaves of the middle harvest is 16 to 18 cm. The flower bouquet is relatively small, compact and hemispherical with 25 to 50 light pink flowers.

Biological characteristics: This variety is adapted to light loose, warm, drained soils moderately rich in nutrients. The length of the vegetation period from planting to flowering is 55-65 days. Due to the strong wind, it does not lie down. It is resistant to Powdery Mildew.

Technological features: Dried lower leaves are yellow to orange on the middle leaves and orange to light red on the upper leaves and high-class yield. The leaf tissue is fine, delicate, meaningful and shiny. It has a pleasant aroma and extremely high-class performance.



Photo 1. Prilep 7



Photo 2. Prilep 79 94

2. Prilep 79 94

The variety Prilep 79 94 was included in National list of newly recognized domestic agricultural crops in 2001 (Decision no. 08-1833 / 2 dated 27.11.2001 MAFWE; Authors: Dr. Bogdančeski M.; Dr. Dimitrieski M.; Dr. Miceska G.; Šiškoski A.). It was created in the Scientific tobacco institute - Prilep, Republic of North Macedonia by generative hybridization (Photo 2).

Morphological characteristics: Plants of this variety have a cylindrical elliptical habitus (up to elongated horny shape), which depends on the growing conditions. The average height of the stem usually varies around 60 to 70 cm. The stem is relatively thin and firm. The number of leaves per plant is about 50 to 55 leaves, which are more densely distributed from the middle to the top, with greater

expression of the top and sub-harvests. The average size of the middle leaves is 18 to 20 cm, and the width is 10.5 to 11.0 cm. Inflorescence is spherical, medium-sized, the color of the flowers is pale pink.

Biological characteristics: Prilep 79 94 gives very good results on light, loose, drained soils, medium rich in nutrients, as well as on weaker soils, especially if there are irrigation conditions.

The vegetation period of this variety from planting to flowering is from 63 to 72 days. The yield of dry tobacco usually ranging from 1800 to 3000 kg / ha, which depends on the conditions and method of cultivation and the applied agro-technical measures.

Technological characteristics: The variety Prilep 79 94 is a small-leaf aromatic variety of tobacco, a typical representative of the type Prilep. The dried lower and middle leaves turn yellow-orange, and the upper orange-reddish live color. The raw material is characterized by high class yield.

It is characterized by a specific intense aroma characteristic of the type prilep, and the taste of smoking is sweet and pleasant. The obtained raw material of this variety is of high quality and compatible with the needs of the market.

3. Prilep 65 94

The variety Prilep 65 94, was included in National list of newly recognized domestic agricultural crops in 2001 (Decision no. 08-1832 / 2, dated 27.11.2001, MAFWE; Authors: Dr. Bogdančeski M.; Dr. Dimitrieski M.; Miceska G.; Šiškoski A.). It was created in the Scientific tobacco institute of - Prilep, Republic of North Macedonia by generative hybridization (Photo 3).

Morphological characteristics: Plants of this variety have an elliptical shape habitus. The average height of flowering plants is about 60 to 65 cm. The average number of leaves per plant ranges from 50 to 55 leaves, which are densely distributed on the stem. Their shape is ovoid-elliptical with moderately pronounced nerve and yellow-green color. The average length of the leaves of the middle belt is about 21 cm in length and 12 cm wide. The flower bud is compact and semi-spherical, and the flowers are pale pink. The shape of the peppermint is ovoid, in mature state it is brown to brown.

Biological characteristics: Variety Prilep 65 94 is adapted to loose, warm, light and drained soils, not very rich in nutrients in field conditions. This variety gives very good results on medium rich soils and unfavorable conditions. The length of the vegetation period from planting to 50% of the flowering is about 70 days. It does not lie in the wind. The average yield in production conditions varies from 1600 to 2600 kg / ha, and in optimal conditions up to 3600 kg / ha. It is resistant to lying down, and to the basara, tolerant of the *Perenospora tabacina* Adam's.

Technological characteristics: The dried leaves have a golden-yellow to light orange color on the leaves of the middle belt and orange-red to reddish-orange color on the leaves of the upper belt. The leaf tissue is soft, elastic and substantial, and when cut we slicing the leaf, a curly and resistant fiber is obtained. It is characterized by a pleasant intense specific aroma and pleasant taste when smoking.

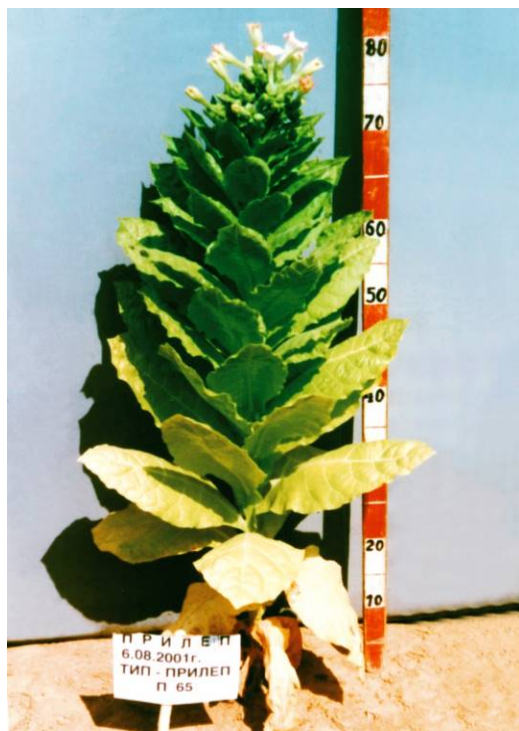


Photo 3. Prilep 65 94



Photo 4. Prilep 123 7

4. *Prilep 123 7*

This newly created variety Prilep 123 7 was included in the National list of newly recognized varieties of domestic agricultural crops in 2005 (Decision no. 08-2522 / 4 of 30.11.2005; Authors: Dr.Dimitrieski M.; Dr. Miceska G. Šhiškoski A ;). It was created in the Scientific tobacco Institute Prilep, Republic of North Macedonia by means of generative hybridization (Photo 4).

Morphological characteristics: The plants have a cylindrical conical shape. The height of the plants varies depending on the growing conditions, and usually varies around 60 to 65cm. The number of leaves per plant is about 50 to 54 leaves, maybe more, depending on the growing conditions. The dimensions of the middle leaves usually is around 19.0 cm (length), and 11.0 cm (width), and the dimensions of the top leaves are about 12.3 cm (length), and 6.0 cm (width). The flower bouquet is spherical and the flowers are pink.

Biological characteristics: Prilep 123 7 is suitable for growing loose, light, nutrient-poor soils in field conditions. It is successfully grown on medium rich soils with nutrients in conditions where there are no opportunities for irrigation. The optimal time for transplanting in the Republic of North Macedonia is May 10-25. The length of the vegetation period from planting to 50% of the flowering is 75 to 84 days, depending on the growing conditions. The first leaves ripen in about 40 days from transplanting, and until the end of the maturation of the top leaves, the total period is about 115-125 days. Shows good tolerance to many diseases. The yield of dry tobacco usually varies from 1900 to 3400 kg / ha, depending on the conditions, the method of cultivation and the applied agro-measures.

Technological characteristics: Prilep 123 7 belongs to the group of oriental small-leaf aromatic varieties of tobacco with characteristic tobacco raw material for the type Prilep. The leaf tissue of the dried leaves is fine, tender, substantial, with a yellow-orange color on the middle leaves and an orange to light red color on the upper leaves.

5. *Prilep 66 9*

The variety *Prilep 66 9* was included in the National list of newly recognized varieties of domestic agricultural crops in 2005 (Decision no. 08-2522 / 3 from 30.11.2005 Authors: Dr. Dimitrieski M.; Dr. Miceska G. Šiškoski A ;). It was created in the Scientific tobacco Institute Prilep, Republic of North Macedonia by intersorted hybridization (Photo 5).

Morphological characteristics: The plants have an elliptical conical shape. The height of the plants varies depending on the growing conditions and the applied agricultural techniques, and under normal development conditions the average height usually varies around 65 to 75 cm. The stem is relatively thin and firm. The number of leaves per plant is about 52 leaves, and more, depending on the growing conditions, and they are nicely and correctly arranged on the stem. The dimensions of the largest leaf varies from 18 to 22 cm, the middle 16-18 cm, and the top 8-10 cm. The flower bunch is relatively small, medium-compact to compact, hemispherical in shape and is not planted between the upper leaves.

Biological characteristics: Variety *Prilep 66 9* is suitable for growing in loose, light, drained soils not rich in nutrients, which gives particularly good results in field conditions. It is also very successfully grown on soils moderately rich in nutrients in conditions where there are no opportunities for irrigation, and this variety achieves a satisfactory yield production and high quality. On such soils, a fine-leaf aromatic, fragrant tobacco recognizable for the *Prilep* type is obtained. In conditions of more intense precipitation during the vegetation period, there may be some increase in the dimensions of the lower-middle leaves, but the quality of the raw material is not impaired. Fertilize with amounts of mineral fertilizer from 250 - 330 kg / ha NPK (8: 22: 20), depending on the soil and pre-crop. Transplanting is done at 40 to 45 cm between rows and 12 to 15 cm in a row (plant by plant). The optimal time for transplanting is May 10-30.

The length of the vegetation period from planting to the beginning of flowering is 70 to 75 days. The leaves ripen successively and are not prone to overripe. The first leaves ripen in about 40 days from transplanting, and until the end of the maturation of the top leaves, the total period is about 115-120 days. Multiple leaves ripen at the same time. The tobacco is harvested on 6-7 hands, about 5-8 leaves together. The variety gives satisfactory results in terms of resistance to *Phytophthora parasitica nicotianae*, *Perenospora tabacina* Adam's and *basara*, and is tolerant of viruses. The yield of dry tobacco usually varies in a wider range and usually ranges from 2000 -3600 kg / ha, depending on the conditions, the method of cultivation and the applied agro-measures.

For last 10 years this variety occupies 80-90 percent of the total tobacco production in our country.

Technological characteristics: The tissue of the dried leaves is fine, delicate, substantial, with yellow-orange color on the middle leaves and orange to light red on the upper leaves. It features an extraordinarily high-class yield. When smoking, it has a well-formed sweet and pleasant taste, pronounced and intense aroma, with medium strength.



Photo 5. Prilep 66 9



Photo 6. Prilep 146-7/1

6. Prilep 146 7

The variety Prilep 146 7 was included in the National list of new recognized varieties of domestic agricultural crops in 2010 (Decision no. 07-623 / 1 from 14.06.2010; Authors: Dr. Dimitrieski M.; Dr. Miceska G. ;Vukovic Ž.; Šiškoski A.). It was created in the Scientific tobacco institute, Prilep, by means of generative hybridization (Photo 6)

Morphological characteristics: The habitat of the plants is elliptically cylindrical in shape. The height of the flowering plants in the variety Prilep 146 7 usually ranges from 60 to 70 cm. The number of leaves per plant is about 50 to 52. The dimensions of the middle leaves range on 23.6 cm (length) and 11.0 cm (width), and the dimensions of the top leaves are about 13.0 cm (length) and 7.0 cm (width). The shape of the leaves is very similar to the leaves of standard varieties Prilep 10-3 / 2 and Prilep 12-2 / 1. The flower bud is hemispherical, and the flowers are pale pink, found in fertile and CMS form.

Biological characteristics: Variety Prilep 146 7 is suitable for growing in loose, light, drained soils not rich in nutrients, which gives particularly good results in field conditions. It is also very successfully grown on soils moderately rich in nutrients in conditions where there are no opportunities for irrigation, with this variety achieves a satisfactory yield and very high quality. The length of the vegetation period from planting to the beginning of flowering is 59 days, and up to 50% of flowering about 70 days. The yield of tobacco per unit area from the performed experiments varies from 2400 kg/ha in unfavorable conditions, up to 4300 kg/ha in flood conditions. It is resistant to the basara and tolerant to the *Perenospora tabacina* Adam`s, and no damage has been noticed from the green net.

Technological characteristics: The dried leaves are fine, tender, rich, with light orange color on the middle leaves and orange to light red color on the upper leaves. The tobacco raw material of the variety Prilep 146 7 has a characteristic aroma, which is identical to the tobacco raw material of the basic basic varieties P10-3 / 2 and P12-2 / 1, by whose aroma the renowned commodity type Prilep is recognizable.

7. *Prilep 112-2 / 1*

The variety *Prilep 112-2 / 1* was included in the National list of newly recognized varieties of domestic agricultural crops in 2010 (Decision no. 07-622 / 1 from 14.06.2010; Authors: Dr. Dimitrieski M., ; Dr. Miceska G. ; Vukovic Ž.; Šiškoski A.)). It was created in the Scientific tobacco institute, Prilep, by means of generative hybridization (Photo 7).

Morphological characteristics: The habitus of the plants is horny, very similar in shape to the habitus and the shape of the leaves as the first standard varieties *Prilep 10-3 / 2* and *Prilep 12-2 / 1*. The average height of flowering plants ranges from about 50 to 60 cm depending on the growing conditions. The average number of leaves per plant is about 48 to 50 leaves. The dimensions of the middle leaves in green are about 22.6 cm (length), and 10.3 cm (width), and the dimensions of the top leaves are about 14.3 cm (length), and 7.7 cm (width).). The flower bud is hemispherical, and the flowers are pale pink. In terms of flowers, the variety is in fertile and CMS form. The yield of dry tobacco usually varies in a wider range, and usually ranges from 1850 to 3300 kg / ha.

Biological characteristics: The variety *Prilep 112-2 / 1* is adapted in loose, warm, light, drained soils and not very rich in nutrients on those soils on which the former standard varieties *Prilep 10-3 / 2* and *Prilep 12-2/1* were grown. The length of the vegetation period from planting to the beginning of flowering is 56 days, and up to 50% of flowering about 65 days. It is resistant to the Powdery mildew and the basara, tolerant to the *Perenospora tabacina* Adam's and no damage from the green net has been noticed.

Technological characteristics: The dried leaves are with a fine, delicate, rich tissue with a light orange shiny color on the middle leaves and an orange to light red and shiny color on the upper leaves, especially on the underside and top leaves. It is characterized by an intensely expressed specific aroma, which is identical to the tobacco raw material of the basic varieties *P10-3 / 2* and *P12-2 / 1*. The taste of smoking is sweet, pleasant and refreshing.



Photo 7. *Prilep 112-2/1*

CONCLUSIONS

Based on the displayed data on the characteristics of some oriental tobacco varieties we can come to the following conclusions:

- All displayed and analyzed varieties of tobacco in our paper are of oriental type and meet the basic characteristics of the given type.
- The oriental tobacco varieties that are the subject of analysis in this paper are a good basis for creating new more productive varieties of oriental type tobacco.

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