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Original Scientific paper

INTRODUCTION OF ORIENTAL TOBACCO VARIETIES UNDER THE ENVIROMENT OF THE AREA NEVROKOP

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ABSTRACT

In three years (2010-2012) studied the biological and economic characteristics of two varieties - Katerini M and Katerini 53 under the environment of the area Nevrokop. Experience is displayed in the experimental field of ETS (Experimental Tobacco Station) G. Delchev .

Variety Katerini 53 and Katerini M differ materially from cultivated tobacco varieties in the region . They are relatively low, with short and dense internodiyas smaller leaves then Bulgarian varieties traditionally grown, so keeping them is associated with high labor costs . The vegetation period is much shorter. Leaves are shortly ripes, which creates a problem for timely harvesting.

The study is detailed and shows that Greek varieties inferior in resistance to important indicator for the region diseases. This, and the above findings, making them inappropriate in our growing in Nevrokop region. Varieties Katerini 53 and Katerini M have good vegetative morphology and uniformity and can be included in breeding programs for new varieties with good smoking and qualities demanded by the firms.

Keywords: oriental varieties , varietal groups , agroecological conditions , introduction, region diseases

ВНЕСУВАЊЕ НА ОРИЕНТАЛСКИ СОРТИ ТУТУН ВО ЕКОЛОШКИТЕ УСЛОВИ НА РЕОНОТ НА НЕВРОКОП

Извршени се тригодишни испитувања (2010-2012) на биолошките и економските својства на две сорти тутун – Катерини М и Катерини 53 во агроеколошките услови на неврокопскиот реон. Опитот се изведуваше на опитното поле од Експерименталната станица за тутун „Гоце Делчев".

Сортите Катерини 53 и Катерини М се разликуваа од култивираните тутунски сорти во овој реон. Тие се релативно ниски, со кратки и густи интернодии и со помали листови во споредба со традиционално одгледуваните бугарски сорти, поради што нивното одржување е поврзано со високи трошоци на трудот. Нивниот вегетационен период е многу пократок. Листовите за брзо време зреат, што претставува проблем за навремената берба.

Проучувањето е детално и покажа дека грчките сорти се со послаба отпорност на поважните болести што се појавуваат во овој реон. Ова, како и горенаведените сознанија ги прават овие сорти неадекватни за неврокопскиот реон. Сортите Катерини 53 и Катерини М имаат добра вегетативна градба и униформност и можат да бидат вклучени во селекционите програми за создавање на нови сорти со добри пушачки и квалитетни својства какви што бараат компаниите.

Клучни зборови: ориентални сорти, вариетени групи, агроеколошки услови, внесување, регионални болести.

INTRODUCTION

Tobacco is the taste - flavoring product and as a commodity is sold mainly on the basis of the established specific dietary qualities. Under the influence of climate , topography and soils in limited geographic environments are formed territorial units in which the varieties constructed material with certain properties. The formation of the typical variety chemical, technological and tasting indicators need specific growing environment. Unlike other crops, tobacco varieties exhibit extreme precision to conditions to express their genetic potential. Each artificial, balanced plant population and especially tobacco varieties maintain their equilibrium only under specific growing conditions (Masheva, V., 2011)

Distribution of world tobacco markets and changing economic situation in the country necessary to obtain material from different varieties and regions allowing the formation of a specific batch typicality and character. Due to ever changing market conditions globally is the tendency for growing atypical for ecotype Nevrokop tobacco varieties - bulgarian and alien. In number of mass growers in the region are varieties of Bulgarian varietal group - Basma - ecotype Kroumovgrad and Greek varieties of Katerini variety group Samsun. These tobaccos are grown in Greece in Katerini area. The main commercial properties that have made them famous tobacco are the great nobility, a very pleasant aroma, mild flavor and excellent burn well as its quality is maintained during long term storage.

The aim of the study was to investigate the morphological characteristics and biological properties of Basma and Samsun groups varieties under atypical theirs conditions to Nevrokop area.

MATERIAL AND METHOD

We studied Katerini 53 and Katerini M varieties nake stalk form - from the famous Turkish varietal group Samsun distributed southwest of Thessaloniki in Katerini and Kroumovgrad 90 variety from ecotype Kroumovgrad, Basma groups. Nevrokop 1146 variety was used as a control.

The study was conducted during the period 2010 - 2012 in the experimental field of ETS (Experimental Tobacco Station) G. Delchev .

Experience is set in triplicate with the experimental plot size 20 sq. Planting distances of 45 cm between rows and 15 cm within rows. Data were recorded on 10 plants of each repetition . The technology of cultivation and agrotechnical measures comply with the requirements of oriental tobacco.

Biometric measurements include:

- plant height
- number of leaves
- sizes 7^{th} , 14^{th} , 21^{st} , 28^{th} leaf
- length of the growing period in days - from transplanting to full bloom
- disease resistance in natural and artificial infection background

RESULTS AND DISCUSSION

Katerini is located in the central part of Greece, in the area of Pieria Piraeus plane. It is situated between Mount Olympus and the Thessalonian Gulf. On the east it borders the beach The average monthly data based on observations of several decades are presented in Table 1 . (www.sec.bg / userfiles / life)

Table 1.Katerini region meteorological characteristics

indices	Performance period									
	V		VI		VII		VIII		IX	
Temperature (C^0)	min	max	min	max	min	max	min	max	min	max
	12,1	24,5	16,3	29,2	18,6	31,5	18,3	31,1	14,9	27,2
Rainfall mm	44,4		29,6		23,9		20,4		27,4	
Relative humidity (%)	64,3		56,3		53,6		55,4		62,5	
Rainy days (number)	10,7		7,5		5,9		4,7		5,9	

The values of these indicators highlight the fact that the area of Katerini features all the characteristics of a Mediterranean climate typical of the fluctuations from year to year are small (Kapouzos, DK et al., 2010) .

Nevrokop area is located in Gotse Delchev Hollow in widespread around periphery of hills and low and high places (Timov, A at all. 1974). In terms of climate, the region belongs to continental - Mediterranean climate region with a warm climate without manifest large variations in individual annual periods. Characterized by the following: (Table 2).

Table 2. Nevrokop area meteorological characteristics

indices	**Performance period**				
	V	**VI**	**VII**	**VIII**	**IX**
Temperature (C^0)	15,7	19,3	21,2	20,5	17,1
Rainfall mm	67	66	63	62	67
relative humidity (%)	62	52	44	35	28

Comparing the data for the two regions is noteworthy that there is little difference in temperature between 3-4 C^0 , which for this period of development of the tobacco plant (V- IX month) is not essential. Temperature sum is optimal for the production of oriental tobacco. As regards the other two parameters - relative humidity (%) and the amount of Rainfall (mm), the difference is about 10 % lower for the atmospheric humidity and Nevrokop area by 20 mm lower Rainfall which in turn has a significant interest on transferred to the new varieties and depressive environment for them .

It is known that plant growth in new areas is first changed physiology - biochemical processes that affect major tobacco signs. Valuable are those varieties that have large adaptation abilities allowing the formation of stable yields. (Dimanov, D. at all. 2012).

Upon removal of the Polish experiment is noteworthy that the Greek varieties with good morphological and vegetative uniformity enabling correctness results Biometric data show that both form the Greek variety plant height of 87-89 cm, and were significantly lower compared to the control Nevrokop 1146 and variety Kroumovgrad 90. This symptom differences were demonstrated in the highest degree of probability (Table 3). Such values for attributes obtained in other studies with varieties of the same group (Shabanov, D., V. Pophristev and N. Tomov, 1969) .

The leaves of the tobacco plant are the main site for industrial use and consumption. Their number in different varieties and different is directly related to the production of tobacco crop. The number of leaves is one indicator, relatively less than the height of the plant is susceptible to modifying effect of external conditions on consolidation varieties. Throughout the test period both Greek variety and variety Kroumovgrad 90 formed fewer leaves (Table 3).

They are 28 to 30, an average of 29 pieces, with 32 pieces for Nevrokop 1146. Found differences with the control options have proven that confirms our previous observations regarding this feature. (Dimanov, D., D. Vitanova, 2011). Internodiyas are short 3.1 to 3.2 cm, so that the leaves are more closely spaced than two Bulgarian variety. Upon comparison of the parameter of the dynamic growth shows that controls Nevrokop 1146 and Kroumovgrad 90 have a pronounced growth after transplanting. Katerini varieties have slower growth, but faster leaf formation.

Size of the tobacco leaves are important morphological trait. On the one hand, they are an indicator of the type characterized tobacco, and the other appeared element in determining the yield and quality of oriental tobacco. Shaped leaves of Katerini 53 and Katerini M are heart-shaped, with a short handle naked. (Fig. 1) lamina is slightly wrinkled and the color is dark green.

Table 3. Plants height and number of leaves

varieties	indices							
	height				number of leaves			
	2010 г.	2011 г.	2012 г	average	2010 г.	2011 г.	2012 г	average
Katerini 53	89,33	85,70	88,00	89,33^{c}---	30,00	30,00	30,00	29,00^{b-}
Katerini M	89,33	85,70	88,00	87,33^{c}---	31,00	28,00	29,00	29,33^{a-}
Kroumovgrad 90	121,33	117,00	121,00	121,33^{np}	32,00	28,00	28,00	29,33^{a-}
Nevrokop 1146	133,30	128,00	132,00	133,33	33,00	32,00	32,00	32,33

Gd 5%(a)-2,080;

Gd 1%(b)-3,145;

Gd 0,1%(c)-5,064

np Gd 5%(a)-15,952;

Gd 1%(b)-24,126;

Gd 0,1%(c)-38,848

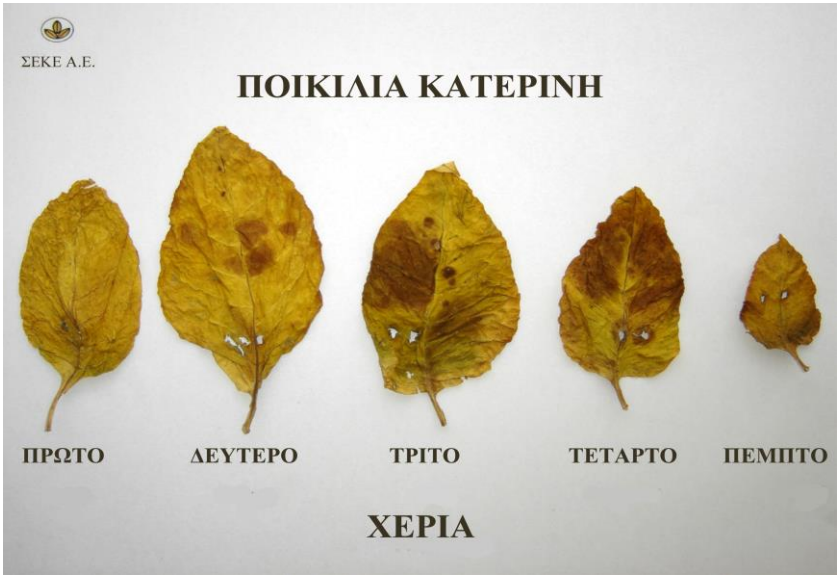

Fig. 1

Compared with the attribute number of leaves, the variation in the dimensions of the leaf is more pronounced and is influenced by the growing environment. Data attributes leaf size - length and width of the 7th, 14th, 21st and 28th leaf (Table 4,5,6,7) show that the three varieties studied form smaller leaves. This trend continued for all harvesting zones. Of two components - the length is highly variable characteristics.

Table 4. Leaves sizes 7th leaf

Varieties	Indices							
	Length 7th leaf				Width 7th leaf			
	2010 г.	2011 г.	2012 г	average	2010 г.	2011 г.	2012 г	average
Katerini 53	21,00	16,60	16,80	18,13^{--}	12,90	10,90	11,60	11,80^{---}
Katerini M	19,70	15,80	16,00	17,17^{--}	12,10	11,20	11,20	11,50^{---}
Kroumovgrad 90	23,10	18,20	23,70	21,67^{np}	13,80	11,80	14,40	13,33^{--}
Nevrokop 1146	25,40	22,60	25,70	24,57	16,70	14,10	16,80	15,87

np Gd 5%(a)-3,038;

Gd 5%(a)-1,440;

Gd 1%(b)-4,596;

Gd 1%(b)-2,178;

Gd 0,1%(c)-7,400

Gd 0,1%(c)-3,507

Table 5. Leaves sizes 14th leaf

Varieties	Indices							
	Length of 14th leaf				Width of 14th leaf			
	2010 г.	2011 г.	2012 г	average	2010 г.	2011 г.	2012 г	average
Katerini 53	18,20	15,20	14,30	15,90^{-}	10,10	10,10	9,30	9,83^{np}
Katerini M	16,10	16,70	15,10	15,97^{-}	9,40	8,30	9,20	9,70^{np}
Kroumovgrad 90	18,70	14,10	18,20	17,00^{-}	11,60	10,50	11,30	10,40 ^{np}
Nevrokop 1146	28,40	17,40	22,70	22,83	19,50	8,80	14,70	14,77
				np	Gd 5%(a)-5,266;			
Gd 5%(a)-5,111;					Gd 1%(b)-7,965;			
Gd 1%(b)-7,730;					d 0,1%(c)-12,823			
Gd 0,1%(c)-12,447								

Table 6. Leaves Sizes 21st leaf

Varieties	Indices							
	Length of 21st leaf				Width of 21st leaf			
	2010 г.	2011 г.	2012 г	average	2010 г.	2011 г.	2012 г	average
Katerini 53	13,7	10,80	10,50	11,66^{-}	7,80	6,60	6,40	6,93^{np}
Katerini M	12,10	10,50	10,20	10,93^{--}	6,80	6,79	6,78	6,79 ^{np}
Kroumovgrad 90	13,70	9,70	13,90	12,17^{-}	7,30	5,40	8,20	6,97^{np}
Nevrokop 1146	17,60	12,00	18,40	16,00	10,30	6,20	11,70	9,40
				np	Gd 5%(a)-3,348;			
Gd 5%(a)-2,777;					Gd 1%(b)-5,063;			
Gd 1%(b)-4,199;					Gd 0,1%(c)-8,153			
Gd 0,1%(c)-6,762								

The results show proved negative differences at different levels of significance for signs in both Greek variety and not proven for a variety Kroumovgrad 90 seventh and 28th leaf.

As mentioned, the width of the leaf is more constant characteristic. In it there is less variation in the values characteristic of the variety. Proven negative differences at different levels of significance were obtained for the width of the 7th and 28th leaf and unproven in the 14th and 21st leaf for all test options.

Table 7. Leaves sizes 28th leaf

Varieties	Indices							
	Length of 28th leaf				Width of 28th leaf			
	2010 г.	2011 г.	2012 г	average	2010 г.	2011 г.	2012 г	average
Katerini 53	9,40	8,00	7,80	8,40--	4,60	3,50	3,60	3,90---
Katerini M	8,40	7,60	7,60	7,87--	3,70	3,20	3,20	3,37---
Kroumovgrad 90	11,40	7,70	10,80	9,67np	5,70	4,40	5,40	5,17 --
Nevrokop 1146	13,70	9,20	12,80	11,90	7,70	5,80	6,80	6,77
Gd 5%(a)-2,215; Gd 1%(b)-3,350; Gd 0,1%(c)-5,393			np				Gd 5%(a)-0,704; Gd 1%(b)-1,065; Gd 0,1%(c)-1,714	

Length of the growing season (planting - full flowering) is a varietal mark . Its duration has significance on the course of all phenophases tobacco plant. This is especially true for oriental tobacco in which the length of the growing season, although subject to the biology of individual species showed a clear dependence on the conditions of the external environment.

The period can be divided into two phases. During the vegetative phase of the tobacco plant are formed the number, size and thicknessof the foliar i.e. signs with a direct effect on the yield and create conditions largely on the quality of the tobacco. By entering the plant at reproductive stage, the process of removal of the plastic materials from the leaves to reproductive organs. For these reasons, a growing season in tobacco varieties to be lasting allowing for the optimal flow of the two phases (Masheva, V. 2007) Katerini varieties have a short growing season, 57 to 58 days (Table 8). Compared with the two Bulgarian varieties grown in the area observed by 5 days Nevrokop 1146 and 10 days with a variety Kroumovgrad 90. The short growing season requires quick handling of the first phase. Leaves with Greek varieties ripen quickly, which creates a problem for the timely collection.

Table 8. Length of the growing period

Varieties	Indices			
	length of the growing period			
	2010 г.	2011 г.	2012 г	average
Katerini 53	56	58	58	57,33 ---
Katerini M	58	60	58	58,67 ---
Kroumovgrad 90	69	70	68	69+++
Nevrokop 1146	62	62	62	62,67
	np	Gd 5%(a)-1,374 Gd 1%(b)-2,078; Gd 0,1%(c)-3,016		

During the vegetation made observations on resistance to some important diseases of tobacco – rot, TMB, mildew and root rotting of natural and artificial infection background. An area Nevrokop are of particular importance rot and TMB. Sustainability was established by inoculation by the method of mechanical inoculation (Kutova I., 1982; Ternovski M., 1956) for TMB and rot and natural infective background of mildew.

In the seedling stage varieties Katerini M and Katerini 53 are highly susceptible to root roting The results of the readings are as follows: to rot Kroumovgrad 90 - 100% sustainability, Nevrokop 1146 to 90 % sustainability and 10% moderately susceptible, Katerini 53 and Katerini M - 0% resistance. For TMB - Kroumovgrad 90 - 60% of sustainability, Nevrokop 1146 to 80 % sustainability and 20% moderately sensitive and 0% resistance to both Greek variety. Observations of mildew made of natural infective background. 2010 all tested variants are susceptible to mildew, the other two years of testing mildew was observed.

CONCLUSIONS

Variety Katerini 53 and Katerini M differ materially from cultivated tobacco varieties in the region. They are relatively low, with short and dense internodyas, smaller leaves Bulgarian varieties traditionally grown, so keeping them is associated with high labor costs.

The vegetation period is much shorter. Leaves are ripen quickly, which creates a problem for timely collection.

The study shows that Greek varieties inferior in resistance index of important disease area. This, and the above findings, making them inappropriate in our growing in region Nevrokop.

Variety Katerini 53 and Katerini M have good vegetative morphology and uniformity and can be included in breeding programs for new varieties with good smoking and qualities demanded by the firms.

REFERENCES

1. Dimanov D., V. Masheva , R.Todorova , A.Yancheva , 2012. Comparative study of the varieties of tobacco from ecotype Municipality. Scientific conference with international participation " Ecology and Health", Proceedings, p. 317-322.
2. Dimanov, D. , D. Vitanova, 2011. Research opportunities for growing foreign oriental varieties for the environment of the area Nevrokop. Bulgarian tobacco, No 1, 5-8
3. Kutova , I. 1991. A Practical Guide immunity in plants. Plovdiv.
4. Masheva C. 2011. Evaluation of new lines oriental tobacco - biological characteristics. Plant Science , № 4, 370-374
5. Masheva C. , 2007. Investstigation incheritance of main indications of oriental tobacco (*N.tabacum, L.*) and possibility for using of proline as a stress marker in breeding Dissertation
6. Timov A., Veselinov M., Atanassov K., Dimitrov Ts, 1974. Oriental tobacco in Bulgaria. Ed Bulgarian Academy of Sciences, Sofia

7. Shabanov, D., Pophristev V., Tomov N., 1969 . Study on introduced varieties of tobacco sortotip Samsun. Plant Science, № 5, 45-54
8. Ternovskiy, M. F., 1956. Genetics and Selection of resistance to cultivated plant. Science.
9. Kapouzos, D.K, Kavalieratou S. and Babajimopoulos C., 2010. Trend Analysis of Precipitation Data in Preria Region (Greece). European Water 30:31-40, EWRA
10. www.sec.bg / userfiles / life - Meteorological characteristics of the region Katerini