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COMPARATIVE STUDY OF PRODUCTIVITY AND COMMODITY YIELD OF VARIETIES AND HYBRIDS OF TOBACCO CULTIVATED UNDER CONDITIONS IN THE SHAKI-ZAGATALA REGION

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Abstract

Selection experience the Zagatala Regional Experimental Station of the Agricultural ET Institute conducted scientific-research work on a total of 71 samples with the results of selection consisting of 36 varieties in the collection area of tobacco and 35 variants in the hybrid area in the Parzivan area. At the end of the study, it was observed that the highest yield was 39.0 c/ha in the Burley TN-90 variety, and the lowest was 27.1 c/ha in the Samsun short-sized variety. Zagatala-Dübek variety has the highest yield of commodity type I-II 90%, III-IV-10% and it differs from others. In the hybrid field, the highest index was 39.7 c/ha in the blue form of Virginia-20×106, and the lowest was 27.9 c/ha in the variant Virginia-548×Virginia KY-160. Virginia-20×Zagatala-Dübek variant had the highest yield of commodity species I-II 92%, III-IV-8% and differed from others.

Keywords: selection, hybrid, experience, tobacco, productivity, variety, variant, commodity type

Introduction

Tobacco production occupies a special place in Azerbaijan's agriculture. The development of tobacco farming in the republic on scientific basis and the creation of high industrial potential in this field coincides with the 60-70 years of the last century. In those years, fertile conditions were created for the rapid development of tobacco farming in Azerbaijan and the strengthening of the industrial potential of this field. In the 1970 s and 1980 s, the cultivated area of tobacco was 17,000 hectares, and the volume of production was more than 60,000 tons. According to the economic importance of The highly profitable tobacco farming area is cultivated in 21 regions of our Republic, mainly in the Sheki-Zagatala region.

In addition to being an economically efficient field, tobacco farming also has wide prospects as one of the important areas for creating new jobs and increasing the income of the population. The development of this field plays an important role in ensuring the employment of the rural population, increasing exports, and bringing foreign currency to the country. tobacco, it is considered the second technical plant after cotton growing in Azerbaijan.

According to the information provided by the Ministry of Agriculture, in 2023, tobacco was planted on 2888.9 hectares of land in the republic. 6289.9 c/ha of dry tobacco products were collected from those areas. Average productivity was 21.7 c/ha [24].

The purpose of the work: taking into account the demand for fragrant tobacco varieties of the farms operating in the Republic, it consists in developing the scientific and practical bases of innovative cultivation technologies in agriculture in the regions, creating high-yielding, high-quality, disease- and pest-resistant tobacco varieties, and organizing their initial seed production.

Effectiveness of research work: comparative analysis of existing varieties of tobacco with new varieties and, as a result, the creation of quality new varieties that are resistant to diseases and pests and meet the modern market requirements, the initial seed production of those created varieties is organized and seed production is carried out in private, peasant-farmer, individual farms engaged in tobacco cultivation. development.

Results and their discussion

C.M. Talai, A.A. Zamanov, N.Q. Hummatov [et. al.] and B.H. Abbasov, G.A. Kazimov writes that tobacco is an economically very efficient plant. In addition to large-leaved, semi-aromatic, aromatic forms of tobacco, Virginia-type aromatic varieties are also cultivated in large areas in the Republic. In the last five

years, the area of this type of tobacco cultivation in Azerbaijan has increased from 1109 hectares to 2405 hectares, and the total tobacco production has increased from 2857 tons to 3316 tons. For many years, the cultivation of small-leaved non-aromatic tobacco varieties was preferred in the republic, and Virginia and Berley varieties, which have high quality and weight characteristics, were not given attention. Moreover, since these varieties are less demanding on fertilizers, their cultivation is favorable from the point of view of environmental protection. Compared to small-leaved varieties, the tobacco raw materials produced from them differ in that the amount of sugars and essential oils is high, and nicotine and proteins, which have a bad effect on the weight quality, are low. Therefore, we recommend the wide use of these varieties in the production of cigarettes [6, p. 96; 1, p. 1-8].

Y.Q. Karimov states that the Sheki-Zagatala region is located in the northwest of the Republic of Azerbaijan. The Republic of Georgia along the Alazan River in a small part from the North-West and South, with the Republic of Dagestan from the north along the southern slope of the Greater Caucasus to the beginning of the Goychay River, as well as the Alazan-Haftaran valley and the Ajinohur frontal mountain region from the south, the Samukh region and Agdash and the southeast It is bordered by Goychay regions. [15, p. 224].

R.R. Mustafayeva the development of tobacco farming, which is a promising and profitable field, will play an important role in creating new jobs, increasing exports, and bringing foreign currency to the country in the near future. At present, local farmers cultivate various varieties of tobacco [5, p. 14-17].

A.Q. Goncharov since tobacco is a light and heat-loving plant, the life processes that take place in it, photosynthesis, the movement of photosynthesis products, and the collection of dry matter are carried out more intensively in light conditions. If the illumination is insufficient, the vegetation period of tobacco is prolonged, the collection of dry matter slows down, the ratio of carbohydrates and proteins in raw materials decreases, and its aroma decreases. [12, p. 20-24].

M. Michae, S. Paul believe that tobacco is considered a drought tolerant plant. The plant is able to produce a lot even with low soil moisture. Tobacco does not stop developing even in soil conditions with little moisture. Because tobacco also has a strongly developed root system, it uses irrigation water to bring the field's moisture capacity closer to that of the soil. Moisture obtained as a result of excessive irrigation has a negative effect on the responsibility of tobacco [20, p. 1-8].

K. Karabacak confirms with his research conducted in 2017 that although the tobacco plant's demand for sunlight during the germination period is low, the demand for light increases during the development of seedlings. Therefore, it is important to plant tobacco on south-facing slopes. In this case, tobacco leaves are of better quality [11, p. 46-48].

Shaobao Wang, YanYong, Yuzhen Xia [et.al.] write that tobacco growth is one of the technical crops that generally lasts 120 days. Tobacco growth is divided into four main stages: 1. Pre-planting stage. 2. Root elongation stage. 3. Flowering stage. 4. Mature stage. The 1st stage refers to the period from planting to transplanting the seedling to the field. The length of this stage can vary according to different growing media and seedling cultivation and growth methods. After transplanting the tobacco seedlings to the field, they gradually adapt to the soil within 5-7 days. Then the stems, leaves and roots grow faster, increasing the demand for fertilizer and water significantly. This period is defined as the 2nd stage. After that, tobacco plants enter a period of vigorous growth called the 3rd flowering stage. This stage is the most important stage and has a great impact on the yield and quality of tobacco. The 4th stage lasts until the end of the tobacco vegetation [22, p. 1-9].

N. Jones, G. N. Sparrow show that tobacco grows better in large and good quality soils. If such lands are fully supplied with rainwater and the humidity is according to the plant's needs, favorable conditions for tobacco production will be created. However, in some regions, the amount of rain during the year may be unevenly distributed. In this case, the water holding capacity of the soil changes the yield of tobacco. Drought and poor distribution of rainfall in the region during the season make tobacco irrigation more of a concern for farmers. Because too much or too little rain causes crop loss [21, p. 16].

I.V. Pavlyuk., G.N. Zhigalkina, V.A. Solomotin believe that the productivity of tobacco depends on the general development of plants, the number of leaves and the size of leaves [16, p. 120].

N. Urmila writes that tobacco leaves contain resin, protein, essential oils, organic acids, ash, phenols and other alkaloids. According to the amount of these alkaloids, "nicotine" is one of the most widespread alkaloids and has a bad smell. Infusions made from tobacco leaves are used against parasites. The sulfate salts contained in nicotine are used as insecticides against leaf parasites. The tobacco industry uses many additives in the production of tobacco products. So, it is known that more than 600 ingredients are added to tobacco products. Modern American companies contain about 10% mixed cigarettes and add sugar, cocoa, menthol, licorice to their composition by weight [8, p. 40].

C. Er, Y. Mustafa state that nicotine ($C_{10}H_{14}N_2$) containing pridine alkaloid is a pharmacologically most powerful stimulating active ingredient of plants belonging to the Solanaceae family belonging to the organic nitrogen group. It was first discovered in 1828 by the German chemists Wilhelm Posselt and Ludwig. They named it "nicotine" in honor of the French doctor Jean Nicot de Villemayne, who was discovered by Reimann during the analysis of tobacco leaves and played a major role in the first spread of tobacco to Europe. Nicotine is a colorless and odorless substance [9, p. 251].

S.B. Ahmadova emphasizes that the tobacco leaf contains 12 substances with a similar chemical structure and therefore have similar names. The most important of them are nicotine, nornicotine, nicotine and nicotimite. Of these substances, the most important medically and socially oriented substance, as well as the most abundant in tobacco leaves, is nicotine [3, p. 77-84].

Q.A. Kazimov it was determined that the highest dry leaf yield and yield of commodity species was obtained in the 90×40 cm food plot at the rate of $N_{45}P_{120}$+20 tons of manure compared to other options. Thus, in the 90×40 cm food area, 27.3 c/ha at 70-80-0% irrigation rate, 28.5 c/ha at 70-80-60% irrigation rate, 26.6 at 70-70-50% irrigation rate made c/ha [15, p. 93-95].

E.V. Gnuchikh and H. Pushta show that tobacco contains more than 30 chemical compounds. Among these compounds, nicotine prevails more, that is, 97%. Chemical compounds such as anabizin, nicotine and nornicotine are produced only in the tissues of the tobacco plant. Currently, nicotine is widely used in the purchase of chemical drugs and in the field of cosmetics. [12, p. 331; 129; 18, p. 24-31].

B.H. Abbasov, G.A Kazimov write that the appearance of ripening spots on the surface of tobacco leaves, the bending of leaf tips and the sound of "click" when broken are the expression of technical product ripening. If such a situation is observed in tobacco leaves, it is possible to start skinning. The leaves of Virginia-type tobacco varieties, unlike local tobaccos, should be picked when 2/3 of the leaf area turns yellow. Before the skin, the edges of the tip of the leaves should be completely yellow, the surface should be bent downwards, yellow bubbles should form on it, and the leaf base should become rough. After the completion of these indicated signs, skins can be started [2, p. 1-8].

F. Akhter, D. Buskles, R. Tito state that from the cultivation of seedlings in the nursery and the stage of transplanting the seedlings to the field until the skinning of the last woody leaves, the collection and processing of tobacco requires a full seven months from April to the end of October [17, p. 153-189].

I. Pesteski, K. Kocoska, M. Srbinozka state that tobacco producers prefer to use mainly Virginia and Burley types of tobacco. Currently, this type of tobacco makes up 80% of tobacco production. These varieties meet the demands of primary producers, processors and smokers for their aromatic taste. However, there is a need to create new varieties taking into account the new requirements. New varieties will be obtained by working hard in this field at Prilep Tobacco Institute [19, c. 59, p. 205-211].

A.I. Aliyeva, N.M. Abdullayeva, B.H. Abbasov [et. al.]. based on their research work, they write that the height of the plant in Virginia-type varieties is 230-240 cm on average for repetitions [4, p. 77-84].

H.Ch. Ekerbicher, U. Berberoglu, M.B. Inchi 1497, French physician Jean Nico de Villemein first brought tobacco seeds to Europe as a medicinal plant. Tobacco seeds were brought to Europe in 1518 and were first planted as a decorative ornamental plant in the Royal Garden in Lisbon. Because it has a beautiful group of flowers and the flower has its own smell. In 1560, French doctor Jean Nico de Villemain sent tobacco seeds to Queen Catherine de Medicis, who was depressed after the death of King Henry II of France. Those seeds were planted in the palace garden. The beautiful group of flowers that opened after the planted seeds bloomed, the Queen liked them very much and began to smell those flowers for a while. At that time, the Queen's headaches, which were suffering from migraine pains, began to decrease and stopped after a while. After this date, tobacco spread to Europe and began to be used as a medicine. Nocola Monorades, a professor of medicine at the University of Sevilla, said in his book that tobacco is useful against many diseases, especially tuberculosis. Finally, the botanical name of the tobacco plant was Nicotiana and in the vernacular it was called "Queen's grass" [10, p. 470-474].

T.H. Tamrazov, S.A. Guliyeva writes that according to the report of the experiment, the entire wet mass of the tobacco in the repetitions is collected and taken into account. 50 typical leaves are selected from each skin, their weight is calculated by weighing them on a scale, they are attached to the stems and the yield is determined by drying them to air-dry state [95, p. 177-181].

Productivity indicators. The wet leaf product obtained from common hides from the experimental area was dried at the supply point in a modern type "Dekloit" (Italy) fire-drying chamber at a temperature of 40-45ºC. Then the obtained dry leaf mass was weighed on an electronic scale and the obtained results are given in table 1.

Table 1

Productivity indicators of the tobacco plant in the field of collection

No	Name of the variety %	Productivityc/ha	commodity yield %	
			I-II	III-IV
1	Bahlul-87	33.2	85	15
2	Islam-35	32.0	83	17
3	Virginia AZ	36.7	88	12
4	Virginia	32.0	81	19
5	Virginia-1	30.3	84	16
6	Virginia-20	36.2	84	16
7	Virginia-3970	31.4	80	20
8	Virginia RGH-4	35.0	81	19
9	Virginia- GL-26	29.6	77	23
10	Virginia Koccer-347	38.2	86	14
11	Virginia-386	30.6	79	21
12	Virginia-548	30.5	77	23
13	Virginia-2261	28.7	75	25
14	Virginia- NC-55	32.7	82	18
15	KY-160 Siqar	25.6	87	13
16	Prilep	32.7	79	21
17	Izmir	29.0	87	13
18	Burley	33.0	78	22
19	Burley -122	34.0	86	14
20	Burley -123	38.0	86	13
21	Burley -78	35.0	88	12
22	Burley TN-90	39.0	85	15
23	106 blue form	32.7	87	13
24	İmmunni-1	29.1	80	20
25	Ostrolist-46	35.2	78	22
26	Krupnolist	35.7	77	23
27	Zagatala largeleaf	37.1	86	15
28	Zagatala -67	38.8	87	13
29	Zagatala Dübeki	29.6	90	10
30	Zaqatala Burley	35.1	89	11
31	Yubilee-8	28.3	77	23
32	Samsun-155	34.7	87	13
33	Samsun short	27.1	75	25
34	Trebizond-1	36.9	84	16
35	Trebizond-5	33.3	80	20
36	Trebizond-135	34.6	81	19

As can be seen from table No. 1, it was observed that the highest indicator was 39.0 c/ha in Berley TN-90 varieties, and the lowest was 27.1 c/ha in Samsun short stature variety. Zagatala-Dübek variety has the highest commodity yield of 90% in I-II and 10% in III-IV.

Table 2

Productivity indicators in the hybrid field for

No	the name of the hybrid	Productivity c/ha	commodity yield %	
			I-II	III-IV
1	Burley-122 x 106 blue form	35.6	90	10
2	Burley-122 x Zagatala-67	33.8	83	17
3	Burley-122 x KY-160 Siqar	30.4	89	11
4	KY-160 Siqar x Burley-122	31.7		12
5	Burley-78 x Burley-122	35.6	87	13
6	Burley x Zagatala largeleaf	30.4	84	16
7	Burley x Zagatala Dübek	34.5	88	12
8	Zagatala Dübek x Burley	32.1	83	17
9	Zagatala Dübeki x Virginia-20	29.7	84	16
10	Zagatala -67 x Berley-122	36.7	80	20
11	Zagatala largeleaf x Burley	37.5	81	19
12	Zagatala largeleaf x Virginia- GL-26	31.6	79	21
13	Zagatala largeleaf x İmmunni-1	34.7	79	21
14	Zagatala largeleaf x Zagatala Dübek	29.1	85	15
15	Zagatala largeleaf x Samsun-155	33.3	83	17
16	İTB-6148 x Virginia Kokker-347	37.8	90	10
17	Virginia-1 x Virginia-548 x Trebizond-135	35.9	87	13
18	Virginia -20 x Zagatala Dübek	36.1	92	8
19	Virginia-20 x 106 blue form	39.7	85	15
20	Virginia-2261 x Virginia-1	35.0	83	17
21	Virginia-2261 x Virginia-1 x KY-160 Siqar	36.5	81	19
22	Virginia -2261 x İmmunni-1	32.7	77	23
23	Virginia NC-55 x KY-160 Siqar	32.9	87	13
24	Virginiya NC-55 x İTB-6148 x Virginiya Koccer-347	37.5	88	12
25	Virginia -548 x KY-160 Siqar	27.9	86	14
26	Virginia-AZ x Burley -78	38.2	89	11
27	Virginiya NC-71 x Zagatala Dübek x Virginia-20	38.7	82	18
28	KY-160 Siqar x Burley -122	36.3	86	14
29	KY-160 Siqar x Virginia AZ	29.1	85	15
30	Immunni-1 x Virginia -2261	28.6	78	22
31	106 blue form x Burley-122	37.9	89	11
32	106 blue form x Virginia-1	38.5	90	10
33	106 blue form x Burley-122	38.7	91	9
34	Samsun-155 x Zagatala largeleaf	35.2	81	19
35	Krupnolist x Burley-122	38.0	86	14

As can be seen from table No. 2, the highest indicator was 39.7 c/ha in Virginia-20×106 blue form, and the lowest was 27.9 c/ha in Virginia-548×KY-160 Cigar variant. In Virginia -20×Zagatala-Dubek variant, the highest commodity yield was 92% in I-II and 8% in III-IV.

Conclusıon

1. Conducted scientific-research work on a total of 71 samples with selection results consisting of 36 varieties in the field of tobacco collection, and 35 variants in the hybrid field;

2. The highest indicator was 39.0 s/ha in Berley TN-90 varieties, and the lowest was 27.1 c/ha in Samsun short stature variety. Zagatala Dübek variety has the highest commodity yield of 90% in I-II and 10% in III-IV.

3. In the hybrid field, the highest indicator was 39.7 c/ha in the blue form of Virginia-20×106, and the lowest was 27.9 c/ha in the variant Virginia-548×Virginia KY-160. In Virginia-20×Zagatala Dübek variant, the highest commodity yield was 92% in I-II, and 8% in III-IV.

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