



EFFECT OF DIFFERENT CULTIVATION AGRO-METHODS ON YIELD AND QUALITY INDICATORS OF VIRGINIA-TYPE AROMATIC TOBACCO VARIETIES

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ABSTRACT

It was talking about the influence of irrigation norms on the productivity of Virginia tobacco varieties and the choice of commodity types in Sheki-Zagatala region. Thus, the highest dry leaf yield is $N_{45}P_{120}+20$ tons of manure on the background of 120×40 cm in the food field, the 22,2 cent/ha was obtained at 70-80-50% irrigation norm, 24,3 cent/ha was at 70-80-60% irrigation norm, 24,9 cent/ha was at 70-70-60% irrigation norm; in the 110×40 cm food field and 26,4 cent/ha was obtained at 70-80-50% irrigation norm, 27,9 cent per 1 ha was at 70-80-60% irrigation norm, 26,3 cent/ha was at 70-70-60% irrigation norm; in the 90×40 cm food area 29,5 cent/ha was obtained at 70-80-50% irrigation norm, 30,1 cent/ha was at 70-80-60% irrigation norm, 27,7 cent/ha was at 70-70-60% irrigation norm.

KEYWORDS

Nutritional condition, sowing scheme, vegetation, irrigation norm



INTRODUCTION

Favorable soil and climatic conditions of our country, the existing labor force, the ability of processing enterprises to meet the needs of raw materials at the expense of local products and the growth of export potential have created favorable conditions for more efficient development of the agricultural sector. Strengthening state support for the development of tobacco growing, Effective use of the potential of this sector in the country in accordance with the "Strategic Road Map" for the production and processing of agricultural products in the Republic of Azerbaijan, approved by Presidential Decree №. 1138 dated December 6, 2016, it has led to an increase in the interest of farmers in the Sheki-Zagatala region in tobacco production.

According to V.H.Abbasov (2007) the largest production and supply of tobacco in the country falls on the Sheki-Zagatala economic regions. Thus, along with the availability of nutrient-rich lands and natural-climatic conditions in the region, the historical employment traditions of the population in these areas have also allowed the preservation of the tobacco industry.

I.H.Ibrahimov et.al (2019) also state that according to recent statistics, tobacco is grown and produced in the country mainly in the Sheki-Zagatala economic regions. In 2020, tobacco was planted on 2907,5 hectares in this region and 6622,3 tons of dry leaf products were produced and handed over to "Azertutun ASK" LLC.

MATERIALS AND METODS

Tobacco is the second most important technical crop in the country after cotton. Therefore, tobacco growing has high prospects for economic development, as one of the important areas for creating new jobs and increasing the income of the population. The natural soil and climatic conditions of the republic allow getting 30-35 centners of quality tobacco per hectare. Especially in spring and autumn, the average monthly climatic conditions in the country are favorable for the cultivation of tobacco, which creates conditions for the purchase of high quality products. According to many studies, our country is one of the first among the CIS countries for the production of the highest quality dry leaf products. In our country, quality tobacco products are obtained in the Sheki-Zagatala region and Nakhchivan AR compared to other regions.

Taking into account the above, in order to further increase the production of high quality dry leaf products on a scientific basis by applying various cultivation methods, experiments were conducted on irrigated lands of Sheki-Zagatala region in 2018-2020.

The following issues have been studied over the years:

- 1.Study of biological properties of tobacco plant.
- 2.Study of the effect of irrigation norms of tobacco plant on leaf productivity.
- 3.Study of the effect of irrigation norms of tobacco plant on the quality indicators of leaf products.
- 4.Study of the effect of different nutritional conditions on tobacco leaf productivity.
- 5.Study of the effect of different nutritional conditions on the quality indicators of tobacco leaf products.
- 6.Influence of different nutrient areas on tobacco leaf productivity
- 7.Influence of different food areas on the quality indicators of tobacco leaf products

The research work was carried out in 4 repetitions in the territory of Sheki Support Station with the average area of 28 m² per plant bed according to the following options.

1.Field moisture capacity

- 1.70-80-50% TRT
- 2.70-80-60% TRT

3.70-70-60% TRT

II. Nutritional conditions

1.N₃₀P₉₀K₉₀

2.N₄₅P₁₂₀+20 tons of manure

3.N₆₀P₁₅₀K₁₂₀

III. Food area

1.120×40 sm

2.110×40 sm

3.90×40 sm

RESULTS AND DISCUSSION

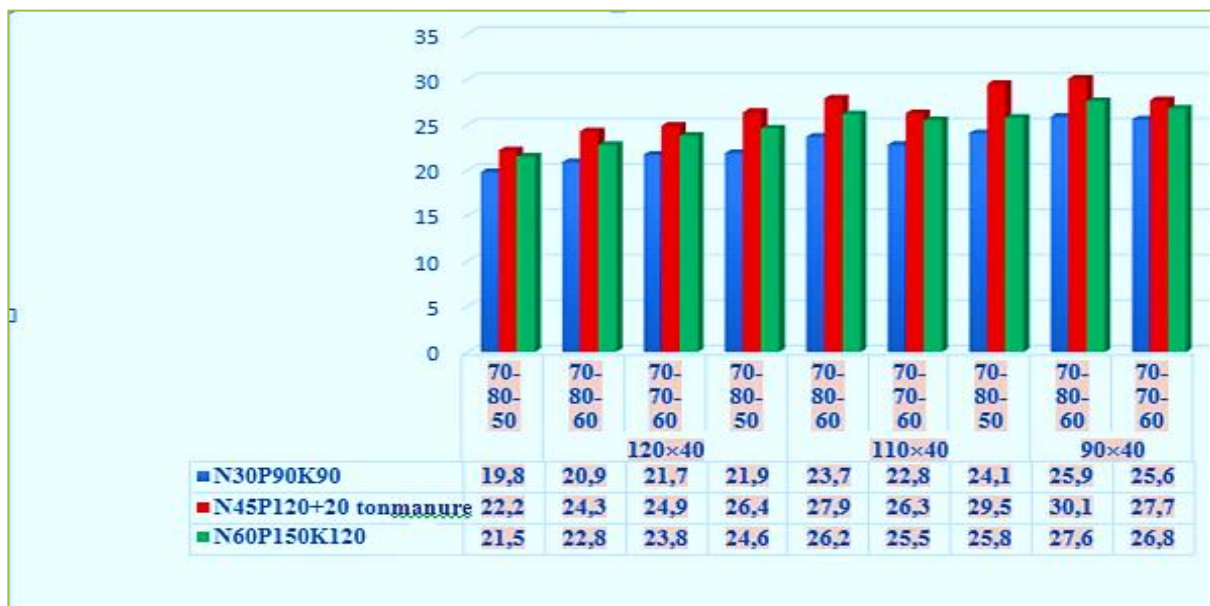
H.A.Aslanov et.al (2014) write that vegetation irrigation in the agricultural system is important in the cultivation of all types of agricultural crops. J.N.Jones et.al (2016) notes that vegetation irrigation is an important operation at all stages of the tobacco plant. Obtaining high-quality leaf products from tobacco depends on the timely irrigation. According to I.B.Bakhrusheva (2016) the irrigation regime is closely involved in all natural physiological and biochemical processes (respiration, photosynthesis, etc.) inside the plant, ensures the air regime of the substrate (soil), the condition and availability of nutrients. Sh.Muhamedjanov et.al (2012) that the irrigation rate is calculated by the amount of water per hectare in the soil layer. Irrigation rate varies depending on the type of plant, developmental phases and other factors. Irrigation rate varies depending on the type of plant, developmental phases and other factors. In general, irrigation should be distributed in such a way that the soil can be provided with moisture even during critical periods of vegetation. Prospects for the development of modern agriculture require minimizing the use of mineral fertilizers to obtain environmentally friendly products. Some developed countries have been able to achieve this to some extent by using organic additives of various origins as an alternative to mineral fertilizers. However, the very high price of such contributions on the world market creates certain problems in the implementation of this work.

L.A.Mikhailova (2015) states that the main criterion for increasing the productivity and improving the quality of agricultural crops is the introduction of a fertilization system. Thus, it is estimated that the use of mineral fertilizers can increase crop yields to 41%. Based on their research, B.H.Abbasov et.al (2020) determined that the application of mineral fertilizers in the required norms has a positive effect on plant productivity and quality. According to A.A.Mertsi (2013) if the soil has enough minerals, it will not need as many nutrients as the plant needs for life. If minerals (NPK) are removed excessively after repeated use of the field, then the plants will grow poorly, become infected quickly and may be completely destroyed.

K.P.Selkov et.al (2017) notes that tobacco is a plant that is very demanding on soil nutrients. If one ton of tobacco is harvested per hectare during the growing season, it carries 60 kg of nitrogen, 16 kg of phosphorus and 38 kg of potassium. T.Novothy et.al (2018) also confirm that studies show that the tobacco plant, unlike other inter-row crops, takes more nitrogen (N), phosphorus (P) and potassium (K) from the soil and feeds it. T.I.Lurman et.al (2001) state that it is true that some of the depleted nutrients can be restored with organic fertilizers (manure) of various animal origin. However, it is impossible to create high-yielding soils at the expense of organic fertilizers. Y.M.Bachura et.al (2012) note that manure is an important organic fertilizer. Manure of various animal origin consists of 25% water, 21% dry matter, 0.5% total nitrogen, 0.25% absorbed phosphorus, 0.6% potassium oxide. In general, many studies show that the productivity of all plants is highly dependent on the area of food per hectare. According to B.H.Abbasova (2015) the sowing density during tobacco cultivation is related to soil-climatic conditions and botanical features of varieties. Recommended food area is 70 × 1560 × 15 cm for small-leaf tobacco species; 70×25, 60×20 cm for middle-leaved; for large-leaved ones it is 90×40 cm.

B.Abbasov (2019) recommended to be 90×40 cm (28,000 plants per hectare) in contrast to the American technology (110×40 cm, 120×40 cm) in Sheki-Zagatala region, the best food field for Virginia-type tobacco "Kokker 347". According to many years of research conducted by E.Umurzakov (1999) Virginia-type tobacco varieties should be buried less sparingly than other Oriental tobacco products when transferred to the field. It was determined that as a result of reducing the number of plants per hectare to 22,000 instead of 22,000 can lead to a 35.3% increase in leaf area, an increase in dry matter in leaves to 4.6%, and an increase in productivity by 12.6%. It is known that the final stage of the options specified in the methodology of each study is calculated by the effect on plant productivity. Productivity, in turn, depends primarily on the cultivation of seedlings. K.Hamade (2014) notes that the first operation for the production of tobacco begins with the construction of a nursery in part of the field and continues in January with the sowing of seeds in the nursery. J.A.Baganova (2001) emphasizes that the optimal combination of improved agro-methods for growing seedlings in the soil substrate plays an important role in the formation, growth and development of standard seedlings before transplanting to the field, resulting in increased tobacco production. I.V.Pavlyuk (2017) state that the future productivity of tobacco depends on the percentage of seedlings in the field after planting, the overall development, the number of leaves and the size of the leaf area. As the leaves is the main product of tobacco, their good development results in increased productivity. Timely picking of mature leaves is one of the biggest factors in increasing productivity. A.G.Demidenko (2015) writes that in general, the average yield of tobacco is about 20-25 centners per 1 ha. The general analysis conducted to determine the productivity for 2018-2020 was calculated based on the dry weight of the leaves in the air and the base moisture. The wet leaf product by picking was dried at a set temperature (40-45°C) in a modern Rolla (Bulgaria) chamber at the supply point. The resulting dry leaf mass was then weighed on an electronic scale and the results obtained are given in the figure 1.

Figure 1. Influence of cultivation methods on productivity of Virginia type tobacco. (c/ha)



Based on the 3-year averages obtained from the study, it can be said that different agro-methods had a comparable effect on the dry leaf yield obtained between the variants. Thus, the highest dry leaf yield is N₄₅P₁₂₀+20 tons of manure on the background of 120×40 cm in the food field, the 22,2 c/ha was obtained at 70-80-50% irrigation norm, 24,3 c/ha was at 70-80-60% irrigation norm, 24,9 c/ha was at 70-70-60% irrigation norm; in the 110×40 cm food field and 26,4 c/ha was obtained at 70-80-50% irrigation norm, 27,9 c/ha was at 70-70-60% irrigation norm; in the 90×40 cm food area 29,5 c/ha was obtained at 70-80-50% irrigation norm, 30,1 c/ha was at 70-80-60% irrigation norm, 27,7 c/ha was at 70-70-60% irrigation norm.

One of the most important stages of the conducted research is the determination of the quality indicators of the tobacco plant. For this purpose, to study the chemical composition of tobacco, the leaf product was sorted according to the state standard No. 8073-77. Leaf samples were taken from different variants, fermented, dried, crushed, passed through a 0.25 mm sieve and analyzed with my participation in the laboratory of the institute. In these samples prepared in the laboratory, nicotine, total nitrogen and water-soluble sugars, etc. were determined and the Schmuck number, which is a quality indicator, was calculated and presented in the table 2.

Table 2. Influence of irrigation norms and nutritional conditions of tobacco variety Kokker 347 of the Virginia type on quality indicators (average for 2018–2021)

Food area sm	Field moisture capacity %	N ₃₀ P ₉₀ K ₉₀							N ₄₅ P ₁₂₀ +20 tons manure							N ₆₀ P ₁₅₀ K ₁₂₀						
		Nikotine	Essential oil	Rezin	Protein	Sugar	Ash	Shumuk number	Nikotine	Essential oil	Rezin	Protein	Sugar	Ash	Shumuk number	Nikotine	Essential oil	Rezin	Protein	Sugar	Ash	Shumuk number
120 × 40	70-80-50	2,9	2,2	6,6	10,3	12,5	16,0	1,21	2,7	2,0	6,4	10,1	12,5	15,3	1,23	2,2	2,2	6,2	10,0	12,8	15,9	1,28
	70-80-60	2,9	2,2	6,8	9,8	11,9	15,8	1,21	2,6	2,1	6,8	10,0	12,9	15,6	1,29	2,7	2,0	6,5	10,1	12,6	15,7	1,25
	70-70-60	2,9	2,3	6,9	9,7	12,4	15,9	1,27	2,6	2,2	6,7	9,7	13,0	15,4	1,34	2,8	2,3	6,5	10,5	12,8	15,9	1,22
110 × 40	70-80-50	2,7	2,2	6,5	9,7	12,0	15,8	1,23	2,6	1,7	6,1	10,0	12,3	15,7	1,23	2,7	2,2	6,2	9,7	12,4	15,7	1,28
	70-80-60	2,6	2,2	6,4	10,0	12,4	15,8	1,24	2,5	2,1	6,4	10,1	13,0	15,5	1,28	2,5	2,7	5,9	10,2	12,4	15,9	1,21
	70-70-60	2,9	2,2	6,1	9,4	12,6	15,7	1,29	2,5	1,9	5,7	9,7	13,2	15,8	1,36	2,6	2,0	5,7	9,7	12,5	15,7	1,29
90 × 40	70-80-50	2,6	2,1	6,1	9,5	12,3	15,5	1,29	2,1	1,7	5,8	9,9	13,0	15,2	1,31	2,4	1,8	5,2	10,3	12,3	15,6	1,19
	70-80-60	2,8	1,7	5,9	10,3	12,3	15,4	1,19	2,0	1,6	5,6	9,9	13,5	15,0	1,36	2,2	1,4	5,3	10,0	12,5	15,3	1,25
	70-70-60	2,5	2,1	6,0	9,4	12,5	15,6	1,32	2,5	1,9	5,8	9,8	13,1	15,3	1,33	2,6	1,9	5,0	9,8	12,5	15,7	1,28

CONCLUSION

The final results of the research were as follows

1. In the 120×40 cm food field and at 70-80-50% of the irrigation norm 22,2 c/ha was obtained, 24,3 c/ha was at 70-80-60% of the irrigation norm, 24,9 c/ha was at 70-70-60% of the irrigation norm;
2. In the 110×40 cm food area and at 70-80-50% of the irrigation norm 26,4 c/ha was obtained, 27,9 c/ha was at 70-80-60% irrigation norm, 26,3 c/ha was at 70-70-60% of the irrigation norm;
3. In the 90×40 cm food area at 70-80-50% irrigation norm 29,5 c/ha was obtained, 30,1 c/ha was obtained at 70-80-60% irrigation norm, 27,7 c/ha was at 70-70-60% irrigation norm
4. Thus, the results of three years of research show that the highest dry leaf yield among the options was obtained against the background of $N_{45}P_{120}+20$ tons of manure, in the 90×40 cm food area and at 70-80-60% irrigation norm.

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