Influence agrotechnical factors vegetative and generative organs of cotton C-278 variety considered

M.I. Maksudova[1*], *R.O.* Oripov[2], *H.E.* Abdurakhmanov [3], and *J.K.* Abdumalikov [2]

[1]Institute of Agrotechnology and Food Security of Samarkand State University named after Sharof Rashidov, Uzbekistan
[2]Samarkand State Veterinary Medicine, Animal Husbandry and Biotechnology University, Samarkand City, Uzbekistan
[3]Scientific Research Institute of Cotton Selection, Seed Breeding and Cultivation, Samarkand Scientific Experimental Station, Samarkand Region, Okdarya District, Uzbekistan

Abstract. According to the experimental program, when we studied the effects of agrotechnical factors on the formation of vegetative and generative organs of the C-278 variety in the phases of cotton, flowering and ripening were obtained. In the ginning phase of cotton, the average weight of the above-ground part of 28-29 cm cotton was 27,7-32,6 grams. In relation to the weight of the vegetative and generative organs of the cotton, the weight of the cotton stem is 40,3-45,9 percent, and the weight of the cotton leaf is 52.9-56.4 percent, and it was observed that 1,0-5,0 percent of the weight of the cotton crop organs. In the flowering phase of cotton, the height of the plant was 57-69 cm according to the options. In the experiment, changing the preirrigation moisture of cotton had a significant effect on the formation of cotton stem mass, where the total weight of the stem, pre-irrigation moisture was 65-65-60 compared to LFMC averaged 119,0 grams under percent irrigation and averaged 140.0 grams under 70-70-60 percent irrigation compared to LFMC before irrigation.

1 Introduction

In the formation of cotton leaf, the ratio of weight of cotton leaf was 39,5 percent on average for the variants, and it was 36,7-41,8 percent for the variants, and there was no sharp difference between the variants and backgrounds.

During the flowering phase of cotton, in the average ratio of the weight of the above-ground part of the cotton by options, the weight of the stem was 36,2 percent, the weight of the leaf was 39,5 percent, and the weight of the crop organs was 24,3 percent was determined.

When the weight of the vegetative and generative organs of cotton is observed to change according to the phases in the experimental variants, the weight ratio of the stem and leaf of the cotton compared to the total weight of the stem decreases during the period of going from the planing phase to the ripening phase. It was noted that this indicator decreased from 42,7

* Corresponding author: mmukaddas77@gmail.com

percent to 24,1 percent in cotton stem, and on the contrary, it was calculated that the growth of crop organs was 2,7 percent in the tillering phase, and the weight ratio in the ripening phase increased to 58,2 percent.

Enterince On March 24, 2022, the decision of the President of our Republic "On measures to support the introduction of new irrigation technologies and increase soil fertility and productivity in cotton fields" was adopted, which is a public measure of the government of our Republic to anticipate future risks, including mitigating the inevitable water shortage. indicates acceptance.

It is known that the creation of cotton varieties suitable for each region and the development of agromeasures for their care, which can fully meet the requirements of the world market, have become an urgent task of the day. For this reason, determining the optimal irrigation, feeding regime and the optimal number of plants for the newly created and regionalized cotton varieties has an important place in the general agrotechnical complex, because this or that type of cotton differs to a certain extent according to the requirements for the external environment.

In the implementation of the above, it is appropriate to zone the cultivated and promising cotton varieties based on certain soil and climatic conditions, taking into account biological and individual characteristics. At the same time, it is important to study the water exchange characteristics of the varieties that are being planted or recommended for planting, and to determine the level of drought resistance of these cotton varieties, especially in the next years when there is a shortage of water.

Based on the above, it is an important issue to determine the irrigation order of the new cotton varieties cultivated in different soil and climate conditions of our Republic, maintaining the optimal number of plants depending on the fertilizer standards and their effectiveness. [1-30]

2 Analysis of literature on the topic

The life activity of a plant organism is the result of complex biological development. This development process is directly related to the quantity and quality of the external environment. The main external environment affecting plant growth and development is temperature, humidity, light and nutrition.

According to the well-known scientist, in agriculture, obtaining a high yield from a plant is achieved by artificially regulating vital factors, and studying this is one of the tasks of agricultural science.

According to Academician, one of the tasks of agricultural science is to reveal that plant nutrition from the soil is a biologically independent process, and based on this, to develop agrotechnical methods to increase productivity by using them.

Academician stated that one factor in plant life cannot replace another, because each factor has its role in plant development.

Therefore, providing the plant with the necessary factors during the growth phase will increase the productivity of the plant.

It is known from the conducted scientific researches that each created variety of agricultural crops is unique and has a different demand for external factors.

Based on this, the study of these important agrotechnical activities has been the cause of great debate among scientists.

According to V. M. Dorofeev 1965, cotton weight and fiber length per boll are higher in late-planted cotton compared to normal-planted cotton, fiber output is reduced, and total yield before frost is sharply reduced, the reason for which is the lack of air temperature during the development of bolls.

According to G.S. Zaitsev 1929, when cotton varieties with large bolls and leaves are planted, they should be watered less until the flowering phase, and on the contrary, more watering should be done during the flowering and harvesting period.

(V. E. Eremenko 1957), on the other hand, advises that late-ripening varieties should be watered less during flowering and harvesting, and early-ripening varieties should be watered more.

(A. Avliyokulov 2010) summarized the results of the current UzPITI (PSUEAITI) research conducted in different soil and climate conditions of our Republic and came to the following conclusions.

From our observations made over the years, it became clear that the growth development, harvest, ripening, seed consumption of all studied medium and fine fiber cotton varieties are directly related to the irrigation regimes to the water nutrient (NPK) norms for seedling thickness.

According to the conclusion of I.Rakhmatov and R.Choriev 1985, in order to obtain a high yield, the water regime of cotton should be compatible with the food regime.

Experiments show that when the water regime is 60-70-65 percent compared to the field moisture capacity of the soil, i.e., in a severe water regime, the amount of fertilizers should be nitrogen-250 kg per hectare, phosphorus-175 kg and potassium-75 kg, and when the amount of fertilizers is increased, i.e. nitrogen per hectare When it is 310 kg, phosphorus - 210 kg and potassium - 100 kg, they considered it appropriate to increase the water regime to 70-70-60 percent.

I.Abdurakhmonov and A. Haydarov 2016 in the conditions of light gray soil of UzPITI Andijan branch, mechanical composition is medium sand, seepage water is 4-5 m below the ground surface, soil moisture is 65-65-60% and 70-70% compared to ChDNS The amount of dry matter (organic matter) accumulated per 1 plant in cotton varieties irrigated at the rate of 3464 m^3/ha and 3982 m^3/ha per hectare in the order of -60% increases from 6% to 10% depending on the rates of mineral fertilizers. In particular, the Andijan-35 variety produced 9-10% more amounts of mineral fertilizers per hectare than the 90x13-1-2 scheme of the variants fed at the rates of NPK-200-140-100 kg. It was 1 gram.

According to the results obtained from the research of A. Avliyokulov et al. (2010), cotton from the medium-fiber Bukhara-8 variety was irrigated in the conditions of the typical gray soils with heavy sand of the Tashkent region in the order of 70-70-60% in the order of 1-3(4)-2 in relation to PV, N-200, P-140, K-100 kg/ha of mineral fertilizers are applied at the rate of 80-90 thousand bushes per hectare, and irrigation is carried out in the order of 70-70-60% in the 1-3-1 system in the barren soils of Kashkadarya region. -220, P-155, K-110 kg/ha are used in the norm, when the planting thickness is 80-90 thousand bushes per hectare, and in the soils of the Bukhara region, irrigation is 75-75-65% in the order of 0(1)-3(4)-1(2) it is possible to achieve a high and quality harvest when it is carried out in the system and N-250, P-175, K-125 kg/ha are applied in the norm, and the seedling thickness is left as indicated above.

Kh. Soliev and U. Siddiqov (1981) determined that the optimal water regime for the An-Uzbekistan-3 and An-402 varieties of cotton is 65-70-60 percent relative to the field moisture capacity of the soil.

T. Ch. Kuchugurova (1978) in the southern zones of the Kyrgyz republic proved the highest yield compared to other water regimes when the soil moisture before irrigation was 70-70-60 percent of the field moisture capacity for cotton varieties 108-F and Tashkent-1.

It can be said that in addition to the scientists mentioned above, many scientific researches have been carried out and are being carried out in this field, but the development of measures that are suitable for the newly created and created cotton varieties, the study of their effectiveness and their introduction to production remain important agrotechnical measures. [31-53]

3 Research method

Field experiments are being carried out from 2021 on medium-fiber S-278 cotton variety in the conditions of average sandy soils, where the grassland of the Samarkand Scientific Experiment Station is gray, and the seepage water is at a depth of 7-8 meters. It is known that the growth and development of agricultural crops depends on the climatic conditions of a particular region, and the agrotechnological processes used for obtaining high and quality crops should be developed accordingly.

It is known that the growth and development of agricultural crops depends on the climatic conditions of a particular region, and the agrotechnological processes used for obtaining high and quality crops should be developed accordingly.

The climate of Samarkand region is continental, dry climate. Cloudy days are rare. The average temperature in January is -20 in the north, -4.8 ^{0}C in the mountains. The lowest temperature is -26-32 ^{0}C. Summer is hot. The average temperature in July is 25.9-27.8 ^{0}C, the highest temperature is 42 ^{0}C.

The amount of precipitation is 280-459 mm, 80% of precipitation is observed in winter and spring. Vegetation period is 324-334 days.

Accorning to L.N. Babushkin's information, the irrigated areas of the Samarkand region belong to the foothills, and the weather is characterized by a sharp continental climate. It is characterized by a rapidly changing climate between years and throughout the year, drought, many hot and sunny days, cold winter, relatively warm and humid spring, and dry, hot summer. In autumn, there are often sharp changes in temperature, short-term frosts, precipitation sometimes turning into snow.

The average annual air temperature in the region ranges from 12.1 to 16.0 ^{0}C, the positive temperature sum is 4158-4588 ^{0}C, and the effective temperature sum is 2145-2408 ^{0}C. The relative humidity of the air is 44-54% during the cropping period, and the amount of precipitation during the year varies from 320-380 mm. The hottest month of the year is July and the coldest month is January. When the weather conditions of the years of experiments were analyzed, the average temperature during the growing season of cotton in 2012 was 22.6 ^{0}C, 1.0 ^{0}C compared to long-term data, and the average annual temperature was 14.9 ^{0}C or 1.3 ^{0}C compared to long-term data. was observed to be higher than It was found that in all months of the vegetation period, the temperature was higher than the long-term data, and it had a positive effect on planting seeds in a favorable period and on the growth and development of cotton. The average relative humidity of the air during the growing season of cotton is 45.8%, which is 4.6% higher than the long-term data, and the annual average is 5.9%.

Humus content in soil analysis by the method of I.V. Tyurin, gross NPK in one sample by the method of M.I. Maltseva, L.P. Gritsenko, N-NH_4 by the Nessler reagent, N-NO_3 by the Grandval-Lyaju method, mobile phosphorus by B.P. Machigin method, in an alternating potassium flame photocolorometer, according to the method of P.V. Protasov, the reaction of the medium (pN) was determined by the potentiometric method.

Gross NPK in plant analysis was determined by the method of K.E.Ginzburg, G.M.shcheglova, E.A.Vilfius in one sample, the technological parameters of the fiber were determined in the regional "Sifat" laboratory on HVI equipment.

In plant biometric measurements: the height of the main stem of cotton (cm), the number of leaves in one plant (pieces), the leaf surface of one plant (cm^2), the number of bolls in one plant (pieces), the mass of cotton in one boll (g) were taken into account.

The experiments consisted of 8 options, in 4 returns, two irrigation regimes and two fertilizer rates, two plants were placed in one layer in the same backgrounds. The experimental variants were planted in selca with 4 rows, 90 cm between rows. During the

cotton vegetation, mineral fertilizers were given to the backgrounds on the basis of an experimental system.

Field experiments were conducted according to PSUEAITI (former UzPITI) and TAITI methods. All analyzes were performed using generally accepted standard methods. Conducting field experiments and laboratory analyzes "Methods of conducting field experiments", " was carried out using methodological manuals, and the obtained data were analyzed according to B.A. Dospekhov.

Table 1. Experience system.

Options	Irrigation regime in relation to ChDNS,%	Amount of fertilizers, kg/ha			Number of bushes, thousand pieces, ha
		N	P	K	
1	65-65-60	200	140	100	90-100
2					110-120
3		250	175	125	90-100
4					110-120
5	70-70-60	200	140	100	90-100
6					110-120
7		250	175	125	90-100
8					110-120

4 Analysis and results

Academician V.R. Williams stated that one factor in plant life cannot replace another, because each factor has its role in plant development. It is known from the conducted scientific studies that each created variety of agricultural crops has its own unique requirements for external factors, therefore, the study of these important agrotechnical measures has been the cause of great controversy among scientists.

It is known that changes in the rate and ratio of applied water and nutrients during the growth period have a certain effect on the development of the plant.

Any plant has its own characteristics in the assimilation of nutrients, and these indicators are different during the period of growth and development. Vegetative, generative organs of the plant have their own physiological role in the process of plant growth, which differs from one another in the assimilation and storage of minerals.

In this regard, we can see the effect of changing the proportions of water and nutrients on the formation of plants in the growth phases of each organ in our scientific research conducted in the vegetative and generative organs of cotton.

Based on the experimental program, scientific observations were carried out in the cotton budding, flowering and ripening phases to study the effect of agrotechnical factors on the formation of vegetative and generative organs of cotton in the growth phases of cotton.

In our observations on the growth and development of cotton in the priming phase, we obtained the same data for the variants, that is, the average height of the plant was 28-35 cm according to the variants, and the weight of the cotton above the ground was 27.7-32.6 grams. When we consider the ratio of vegetative and generative organs of cotton to the weight of the above-ground part of cotton in percentages, the weight of the stem was 40.3-45.9 percent and the average was 42.7 percent, and the weight of the cotton leaf was 52.9-56.4 percent. , with an average of 54.2 percent, it was determined that the ratio of the weight of the cotton organs was 1.0-5.0 percent, and the average ratio was 2.7 percent. As it can be seen from the received data, it was found that 54.2% of the total weight of the cotton above-ground part - cotton leaf,

42.7% - cotton stem, and 2.7% - crop organs made up the total weight of the cotton surface. (Table 2)

Table 2. Undried proportions of vegetative and generative organs in the field of cotton during the heading phase. (as of June 10)

Options	**Plant height, ce**	**The weight of the upper part of the cotton, gr**	**Stem weight**		**Leaf weight**		**Shona weight**	
			gr	%	gr	%	gr	%
1	32	31.2	13.4	42.9	16.6	53.2	1.2	3.8
2	31	27.7	12.0	43.3	15.1	54.5	0.6	2.2
3	28	30.2	12.7	42.1	16.0	52.9	1.5	5.0
4	32	31.9	13.4	42.0	17.5	54.8	1.0	3.1
5	33	32.6	13.9	42.6	17.3	53.1	1.4	4.3
6	35	30.7	14.1	45.9	16.3	53.1	0.3	1.0
7	28	28.9	12.2	42.2	16.3	56.4	0.4	1.4
8	29	25.3	10.2	40.3	14.2	55.3	0.9	3.6
	31	29.8	12.7	42.7	16.2	54.2	0.9	2.7

The following information was obtained from our observations on the formation of vegetative and generative organs of cotton during the flowering phase. In the experiment, the height of the plant on July 5 was 57-69 cm according to the options and 59.4 cm on average. The total dry mass of the above-ground part of the cotton was 129.6 grams according to the average options, and it was noted that these indicators had different effects on the formation of the mass of the cotton stalk with changes in the pre-irrigation moisture content of the cotton, that is, the total weight of the stem, the pre-irrigation moisture content was 65-65- It was taken into account that the average was 119.0 grams in the background of 60 percent irrigation, and the average pre-irrigation moisture was 140.0 grams in the background of 70-70-60 percent irrigation compared to PV. If we consider the ratio of cotton organs to the total mass of cotton in percentages, the weight of the cotton stalk is 36.2 percent on average, these indicators are 32.5-35 in the irrigation regime of 65-65-60 percent compared to PV g before irrigation. 5 percent and an average of 34.2 percent, and the pre-irrigation moisture content of 70-70-60 percent of PV was higher in the irrigated options, and it was noted that it was 38.2 percent on average and 34.6-40.0 percent according to the options.

Table 3. Undried mass ratios of vegetative and generative organs in the flowering phase of cotton in the experimental field. (dated July 5)

Options	Plant height, ce	The weight of the upper part of the cotton, gr	Stem weight		Leaf weight		Shona weight	
			gr	%	gr	%	gr	%
1	57	117	38	32.5	47	40.2	32	27.3
2	58	107	38	35.5	42	39.3	27	25.2
3	57	128	45	35.1	50	39.1	33	25.8
4	59	125	42	33.6	48	38.4	35	28.0
5	60	140	56	40.0	56	40.0	28	20.0
6	62	136	47	34.6	50	36.7	39	28.7
7	63	141	56	39.7	59	41.8	26	18.4
8	69	143	55	38.5	58	40.6	30	20.9
	59.4	129.6	47.1	36.2	51.3	39.5	31.3	24.3

Table 4. Undried proportions of vegetative and generative organs of cotton in the ripening phase. (as of August 15)

Options	Plant height, ce	The weight of the upper part of the cotton, gr	Stem weight		Leaf weight		The weight of the organs of the crop.	
			gr	%	gr	%	gr	%
1	85	435	85	19.5	104	23.9	246	56.6
2	89	397	74	18.6	94	23.7	229	57.7
3	90	475	82	17.3	113	23.8	280	58.9
4	91	441	80	18.1	101	22.9	260	59.0
5	94	523	95	18.2	117	22.4	311	59.5
6	95	485	86	17.7	116	23.9	283	58.4
7	97	619	120	19.4	142	22.9	357	57.7
8	101	555	99	18.2	124	22.8	32.2	59.1
	92.8	491.3	90.1	17.8	134	24.1	286	58.2

.

When we observed cotton leaf formation, cotton leaf weight ratios averaged 39.5 percent across variants and ranged from 36.7 to 41.8 percent across variants, with no significant differences between variants and backgrounds.

Also, in the flowering phase of cotton, i.e. on July 5, the influence of agrotechnical factors on the formation of crop organs was the same, the weight of the crop organs in the experimental variants was from 26 grams to 39 grams, an average of 24.3 percent, and the pre-irrigation humidity was 65-65-60 percent compared to PV against the background of irrigation. average 26.6 percent, and it was taken into account that pre-irrigation moisture was 22.0 percent on average in the background of 70-70-60 percent irrigation compared to PV.

In short, in the flowering phase of cotton, it was found that the weight of the stem was 36.2 percent, the weight of the cotton leaf was 39.5 percent, and the weight of the crop organs was 24.3 percent on average (Table 2).

In the experiments, we observed that the vegetative and generative organs of cotton, the weight of cotton without drying, changes according to the phases, that is, the ratio of the weight of the cotton stem and leaf to the total weight of the stem decreases during the period from the planing phase to the ripening phase, and this indicator is 42.7 in the cotton stem. percent, to 17.8 percent, from 54.2 percent to 24.1 percent in cotton leaf, and on the contrary, the growth of crop organs was 2.7 percent in the tillering phase, and the weight ratio in the ripening phase increased to 58.2 percent (Figure 1).

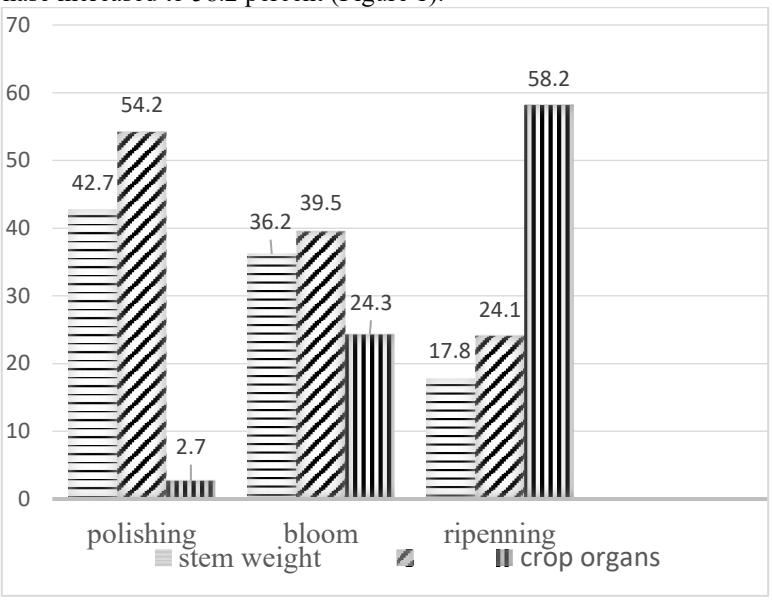

Fig. 1. Changes in the proportions of the mass of vegetative and generative organs of the S-278 cotton variety by growth phases.

5 Conclusions and suggestions

The following conclusions and suggestions can be made based on the data obtained from the experience.

In the experiment, it was found that the change of the norms and proportions of the elements of water and nutrients used during the growing season had an effect on the phases of the plant's development.

The effect of changing the pre-irrigation moisture content of cotton on the formation of cotton stem mass was different, and this pre-irrigation moisture content was 119.0 grams in the background of 65-65-60 percent irrigation compared to PV, while the pre-irrigation moisture content was 70-70-60 percent compared to PV. the average was 140.0 grams against the background of irrigation.

In the experiment, the proportions of cotton leaves averaged 36.7-41.8 percent for the variants, and no sharp differences were noted between variants and backgrounds.

It was noted that the weight ratio of cotton stem and leaf compared to the total weight of the stem decreases during the period from the tillering phase to the ripening phase. was 2.7 percent in the ripening phase, and it was observed that the weight ratio in the ripening phase increased to 58.2 percent.

According to the data obtained from the experiment, the optimal use of agrotechnical factors in the formation of plant yield elements in the growth phases of cotton and clarification of it prepares the ground for obtaining a high yield from cotton in agriculture.

References

1. Avliyokulov.- Scientific justification and implementation of cotton varieties care in climatic soil, meliorative hydrogeological conditions of the northern, central and southern regions of our country. International scientific-practical conference on the topic "Resource and water-saving technologies of crop production from crops in the farming system" collection of lectures. Tashkent-2010.
2. Abdurakhmanov, A. Khaidarov.- Effect of watering and feeding procedures on dry matter content of cotton varieties. Collection of materials of the international scientific-practical conference on the topic "Actual directions of field crop breeding and agrotechnologies" (part 2) Tashkent-2016.
3. Avliyokulov, M. Hasanov, T. Rajabov, M. Ikromova - a collection of articles based on the reports of the International scientific and practical conference on the topic "Resource and water-saving technologies of growing crops from crops in the farming system". Tashkent-2010.
4. V.R.Williams.-Soil Science; agriculture with basic soil science. State Publishing house of collective farm and state farm literature. ("Selkhoziz" Moscow -1936)
5. V.M. Dorofoev. - The influence of environmental conditions on the properties and characteristics of cotton plants. Works of the Soyuznikha. Tashkent 1965
6. Sh. Kuchkarov and others - Agrotechnics of cotton varieties in different soil and climate conditions. Jur. Agriculture of Uzbekistan No. 8. 1992.
7. T.D. Lesenko.- Pochvennoe pitanie rastenii-korennoy vopros nauki zemledeliya. Izdatelstvo seleskohozyaystvennoy literatury, zurnalov i plakatov. Moscow – 1962
8. T.D. Lesenko. - Soil nutrition of plants is a fundamental issue in the science of agriculture. Publishing house of agricultural literature, magazines and posters. Moscow -1962
9. Kh.Soliev, U.Siddikov.- Agrotechnics of new varieties. Jur. Agriculture of Uzbekistan. No. 6. 1981
10. Sanakulov A.L. Optimizing nitrogen nutrition in the cultivation of cotton under a film in the conditions of grassland gray soils: dissertation abstract written for the degree of candidate of agricultural sciences. -Samarkand, 2005. -21 p.
11. Sanakulov A.L., Hamedov B.A. The role of photosynthetically active radiation in increasing the yield of cotton // Prospects for the development of the agricultural economy, materials of the conference of professors and teachers. -Samarkand, 2007. - B. 27-29.
12. Sarimsokov M.M. Factors of rational use of water. Scientific basis of development of cotton growing and grain growing in farms. Collection. Tashkent-2006. Page 121.
13. Sarimsakov M.M. Studying the effective methods of planting and watering the Aqdarya-6 variety of cotton under the conditions of typical gray soils // Dissertation abstract written for the degree of Candidate of Agricultural Sciences. - Tashkent. 2004. - 22.
14. Shamsiyev A. How should the Okdaryo-5 variety be irrigated under the conditions of the Tashkent region? Agricultural journal of Uzbekistan. **4**, 36-37 2001.

15. Shamsiyev A.S. Water consumption and irrigation method of newly zoned S-6524, Okdaryo-5 and promising Andijan-33, Andijan 34 cotton varieties on typical gray soils (as an example of Tashkent region) // Candidate of Agricultural Sciences Dissertation abstract written for obtaining a scientific degree. - Tashkent. 2003. -S.20.
16. Toshaliyev A.T. Optimum irrigation system for various cotton varieties in grassland soils of Central Fagana. Technology of growing cotton and other crops. Scientific collection. 1994. pp. 34-36.
17. Tashmatov M.N. Water resource-saving technology //Scientific and practical foundations of soil fertility improvement. International
18. Khafizov B.T. Water, nutrient (NPK) standards and irrigation procedure of the medium fiber "Denov" cotton variety. Scientific and practical foundations of soil fertility improvement. Tashkent 2007. Page 317.
19. Maksudova, F., Mamatkulov, Z., Vakhidova, N., & Narzullaev, D. (2023). Biopharmaceutical study of general tonic capsules by in vitro method. BIO Web of Conferences, **71**, 01083. https://doi.org/10.1051/bioconf/20237101083
20. Karieva, E. S., & Maksudova, F. K. (2017). Use of Mathematical Planning Methods for Selecting Optimum Combined Gel Compositions. Pharmaceutical Chemistry Journal, **51(5)**, 411–415. https://doi.org/10.1007/s11094-017-1624-1
21. Mamadzhanov, B., Shukuraliev, A., Mannobboev, S., Turaev, S., Patidinov, A., & Mavlyanova, S. (2024). Dielectric separation. E3S Web of Conferences, **471**, 02017. https://doi.org/10.1051/e3sconf/202447102017
22. Nessipkhan, B., Shamikh Al-Saedi, H. F., Jassim Al-saray, M., Hameed Jasim, H., Sattar, R., Ali Ahmed, B., ... & Muzaffar, Z. (2023). Application of Iron Oxide Nanoparticles as MRI Contrast Enhancers: A study in Rabbits. Journal of Nanostructures, **13(3)**, 769-776.
23. Gulyamova, G. S., Mavlyanova, S. Z., & Boboev, K. T. (2015b). The role of a polymorphic variant of the tumor-α necrosis factor gene in the development of atopic dermatitis in the population of Uzbekistan. Russian Journal of Clinical Dermatology and Venereology, **14(4)**, 79. https://doi.org/10.17116/klinderma201514479-83
24. Ochilov, S., Kadirov, V., Umirzoqov, A., Karamanov, A., Xudayberganov, S., & Sobirov, I. (2022c). Ore stream management on the development of deposits of natural and technogenic origin. AIP Conference Proceedings. https://doi.org/10.1063/5.0093311
25. Akramov, B. S., Khayitov, O. G., Umirzokov, A. A., Nuritdinov, J. F., & Kushshaev, U. K. (2022b). Forced fluid withdrawal as a method of enhanced oil recovery in hydrocarbon fields. AIP Conference Proceedings. https://doi.org/10.1063/5.0091268
26. Bekpolatov, J., Mishareva, M., Salizhanova, G., Aminzhanova, S., Umirzoqov, A., & Xatamov, G. (2022b). Technological research of gold-containing ore of the interfluve section. AIP Conference Proceedings. https://doi.org/10.1063/5.0090782
27. Nasirov, U. F., Ochilov, S. A., Umirzoqov, A. A., Xudayberganov, S. K., Narzillaev, A. N., & Sobirov, I. S. (2022d). Development of algorithm for managing mineral resources of deposits. AIP Conference Proceedings. https://doi.org/10.1063/5.0091542
28. Umarova, I., Makhmarezhabov, D., & Umirzokov, A. (2023b). INVESTIGATION OF THE USE OF ION FLOTATION FOR THE EXTRACTION OF COPPER FROM SULFURIC ACID SOLUTIONS. NEWS of National Academy of Sciences of the Republic of Kazakhstan, **1(457)**, 202–210. https://doi.org/10.32014/2023.2518-170x.270

29. Khayitov, O., Saidova, L., Galiev, S., Umirzokov, A., & Mahkamov, M. (2023e). INTERRELATION OF PERFORMANCE INDICATORS OF TECHNOLOGICAL TRANSPORT WITH MINING CONDITIONS OF A QUARRY. NEWS of National Academy of Sciences of the Republic of Kazakhstan, **1(457)**, 226–239. https://doi.org/10.32014/2023.2518-170x.272
30. Zholdasbekov, A., AbdulHussein, A. H., Hashim, A. M., Hassan Ahmed, H., Mohammed Hani, M., Shnishil, A. T., ... & Azamat Abdurashidovich, U. (2023). Role of Gold Nanoparticles in Inhibiting Amyloid Formation and Reducing Vascular Dementia Risk. Journal of Nanostructures, **13(3)**, 703-709.
31. Mukhtarovna, K. M., Shamikh Al-Saedi, H. F., Hameed, O. M., Jassim Al-saray, M., Hameed Jasim, H., Alajeeli, F., ... & Gulnaz, B. (2023). Histological and Immunohistochemical Evaluation of Silver Nanoparticle-Mediated Wound Healing in Rabbits. Journal of Nanostructures, **13(3)**, 747-754.
32. Bekpulatov, J. M., Makhmarezhabov, D. B., & Umirzokov, A. A. (2024c). On the Possibility of Waste-Free Use of Mineral Resources of the Angrensky Brain Coal Deposit. E3S Web of Conferences, **491**, 02018. https://doi.org/10.1051/e3sconf/202449102018
33. Ochilov, S., Makhmudov, Nizamova, A., Norinov, S., & Umirzokov, A. (2024a). Methods for calculating the parameters of drilling and blasting operations based on the primary determination of the zones of destruction of the rock mass. E3S Web of Conferences, **491**, 02014. https://doi.org/10.1051/e3sconf/202449102014
34. Bobomuratov, T. A., Karimova, N. A., Tursunbayev, A. K., & Nurmatova, N. F. (2023). Complications from the cardiovascular system in children who have had COVID-19. In E3S Web of Conferences **381**, 01092. EDP Sciences.
35. Nurmatova, N. F., Mirsalikhova, N. K., Asilbekova, M. A., Irsalieva, F. K., Dustbabaeva, N. D., & Akhmedov, J. K. (2020). Body sensitization to various antigens in children with chronic hepatitis B and concomitant giardiasis. Russian Journal of Immunology, **23(4)**, 493-498.
36. Irsalieva, F. K., Dustbabaeva, N. D., Kamalov, Z. S., Ziyadullaev, S. K., Nurmatova, N. F., & Akhmedov, Z. K. (2020). IL17A rs2275913 polymorphism and features of immunological parameters in patients with persistent allergic rhinitis during allergen-specific immunotherapy. Russian Journal of Immunology, **23(4)**, 449-460.
37. Dustbabaeva, N. D., Irsaliyeva, F. K., Nurmatova, N. F., Baybekova, V. F., Aydarova, N. P., & Akhmedov, K. S. (2020). IL17A rs2275913 gene polymorphism in Uzbek ethnic group and its linkage with development of allergic rhinitis. Russian Journal of Immunology, **23(4)**, 443-448.
38. Nasirov, U., Umirzokov, A., Nosirov, N., Fatkhiddinov, A., Eshonkulov, U., & Kushnazorov, I. (2024b). Study of the Production and Efficiency of Variable and Loading Equipment in the Mining of Minerals. E3S Web of Conferences, **491**, 02022. https://doi.org/10.1051/e3sconf/202449102022
39. Barahona, W. E., Ruiz, C. D., Vargas, V. M., Saigua, J. H., Abdurashidovich, U. A., Abduraimovna, I. O., ... & Khurramova, M. M. (2024). Evaluation of environmental aspects for the implementation of a textile company. Caspian Journal of Environmental Sciences, **22(2)**, 443-451.
40. Khayitov, O., Umirzokov, A., Rakhmatov, U., Gafurov, S., & Abdurakhmonova, S. (2024b). Identification and contouring of anomolies in the heat flux density and surface temperature. E3S Web of Conferences, **538**, 01001. https://doi.org/10.1051/e3sconf/202453801001

41. Khayitov, O., Umirzokov, A., Yusupkhojaeva, E., Abdurakhmonova, S., Kholmatova, N., & Akhmedova, N. (2024c). Innovative methods for substantiation of the final oil recovery recovery factor. E3S Web of Conferences, **538**, 01031. https://doi.org/10.1051/e3sconf/202453801031
42. Hilal, M. M., Alyami, M., Rendal, E., Algburi, S., Sameen, A. Z., Khurramov, A., & Barakat, M. (2024). Assessing Climate Strategies of Major Energy Corporations and Examining Projections in Relation to Paris Agreement Objectives within the Framework of Sustainable Energy. Unconventional Resources, 100127.
43. Khurramov, A., qizi Khurramova, M. M., Kholmirzaev, M., Minavvarov, J., Ergashev, G., Djalilova, M., & Esankulov, A. E. (2024). Evaluating the growing importance of IT in the management of transport logistics and supply chain. In E3S Web of Conferences **549**, p. 06010. EDP Sciences.
44. Jabborova, D., Mamurova, D., Umurova, K. K., Ulasheva, U., Djalolova, S. X., & Khurramov, A. (2024). Possibilities of Using Technologies in Digital Transformation of Sustanable Development. In E3S Web of Conferences **491**, p. 01002. EDP Sciences.
45. Udayakumar, R., Mahesh, B., Sathiyakala, R., Thandapani, K., Choubey, A., Khurramov, A., ... & Sravanthi, J. (2023, November). An Integrated Deep Learning and Edge Computing Framework for Intelligent Energy Management in IoT-Based Smart Cities. In 2023 International Conference for Technological Engineering and its Applications in Sustainable Development (ICTEASD) (pp. 32-38). IEEE.
46. Chandramowleeswaran, G., Alzubaidi, L. H., Liz, A. S., Khare, N., Khurramov, A., & Baswaraju, S. (2023, August). Design of financing strategy model of financial management based on data mining technology. In 2023 Second International Conference On Smart Technologies For Smart Nation (SmartTechCon) (pp. 1179-1183). IEEE.
47. Uralovich, K. S., Toshmamatovich, T. U., Kubayevich, K. F., Sapaev, I. B., Saylaubaevna, S. S., Beknazarova, Z. F., & Khurramov, A. (2023). A primary factor in sustainable development and environmental sustainability is environmental education. Caspian Journal of Environmental Sciences, **21(4)**, 965-975.
48. Xidirberdiyevich, A. E., Ilkhomovich, S. E., Azizbek, K., & Dostonbek, R. (2020). Investment activities of insurance companies: The role of insurance companies in the financial market. Journal of Advanced Research in Dynamical and Control Systems, **12(S6),** 719-725.
49. Barahona, W. E., Ruiz, C. D., Vargas, V. M., Saigua, J. H., Abdurashidovich, U. A., Abduraimovna, I. O., ... & Khurramova, M. M. (2024). Evaluation of environmental aspects for the implementation of a textile company. Caspian Journal of Environmental Sciences, **22(2)**, 443-451.
50. Abduvasikov, A., Khurramova, M., Akmal, H., Nodira, P., Kenjabaev, J., Anarkulov, D., ... & Kurbonalijon, Z. (2024). The concept of production resources in agricultural sector and their classification in the case of Uzbekistan. Caspian Journal of Environmental Sciences, **22(2)**, 477-488.
51. Hasanov, A. S., Burkhanov, A. U., Usmonov, B., Khajimuratov, N. S., & qizi Khurramova, M. M. (2024). The role of sudden variance shifts in predicting volatility in bioenergy crop markets under structural breaks. Energy, **293**, 130535.
52. Abdullah, D., Gartsiyanova, K., Qizi, M., Madina, K. E., Javlievich, E. A., Bulturbayevich, M. B., ... & Nordin, M. N. (2023). An artificial neural networks approach and hybrid method with wavelet transform to investigate the quality of Tallo River, Indonesia. Caspian Journal of Environmental Sciences, **21(3)**, 647-656.

53. Hartono, H., Hanoon, T. M., Hussein, S. A., Abdulridui, H. A., Ali, Z. S. A., Mohammed, N. Q., ... & Yerkin, Y. (2024). Optimal Orientation of Solar Collectors to Achieve the Maximum Solar Energy in Urban Area: Energy Efficiency Assessment Using Mathematical Model. Journal of Operation and Automation in Power Engineering, 11(Special Issue (Open)).