



UDK 63

MINERAL FERTILIZER STANDARDS IN COTTON SECTIONS EFFECT ON NPK QUANTITIES

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Annotasiya. Maqolada Qoraqalpog'iston Respublikasining Orolbo'yi sug'oriladigan o'tloqi-allyuvial tuproqlari sharoitida almashlab ekish tizimlari orqali yetishtiriladigan asosiy g'o'za, kungaboqar, kunjut va soya ekinlarining N, P, K miqdorlarini aniqlash maqbul o'g'itlash tizimiga bag'ishlangan tajriba natijalari keltirilgan .

Kalit so'zlar: g'o'za, kungaboqar, kunjut, soya, rivojlanish davri oziqa modda.

Аннотация. В статье представлены результаты экспериментов по оптимальной системе удобрения для определения количества N, P, K основных культур хлопок, подсолнечника, кунжута и сои, выращиваемых в Республике Каракалпакстан в условиях орошаемых лугово-аллювиальных почв Приаралья

Ключевые слова: хлопок, подсолнечник, кунжут, соя, питательные вещества в период развития.

Abstract. In the article, the Aral Sea-Fed meadow of the Republic of Karakalpakstan-alluvial soil in the conditions of the exchange of planting systems through the results of the experiment devoted to the optimal fertilization system of determining the quantities of N, P, K of the main cotton, sunflower, sesame and soybeans are presented.

Key words: wheat, sunflower, sesame, soybeans, nutrient substance of the period of development.

Introduction. It is important to develop optimal standards for the application of mineral fertilizers to obtain high cotton yields from cotton grown after the main crops such as winter wheat, corn, sunflower, safflower, rice, sesame, soybeans in the Republic of Karakalpakstan.

This is because the type of crops planted to create a favorable environment in the soil, the system of crop rotation and the level of agro-technology of care have a significant impact not only on the agrophysical properties of the soil but also on its agrochemical and reclamation properties.

Therefore, in the conditions of the Republic of Karakalpakstan, it is important to scientifically and practically substantiate the impact of optimal fertilizer rates on cotton yields after past grain crops.

Literature review. Z.Tursunkhodjaev (1972), N.Kashkarov (1979) in the systems of crop rotation 3: 7, 2: 6, 2: 4, 1: 4: 1: 4, 2: 4: 1: 3, etc. in different soil and climatic conditions of the republic.), N.Khalilov, P.Bobomirzaev, (2002), X.Atabaeva, O.Qodirxodjaev (2006), D.Yormatova, X.Xushvaqtova (2008), M.Amanova, A.Rustamov (2010), T.Azizov , I.Anarbaev and others (2010, 2016) Sh.Nurmatov and others (2012), B.Izbasarov (2016), M.Amanova, L.Allanazarova (2017), R.Sidikov and others (2017), A.Amanov and others (2017) have conducted a number of scientific studies on various factors by a number of brilliant scientists and have given the necessary practical recommendations for production.

Research Methodology. Research is conducted through field experiments. Experiments, phenological observations, soil and plant sampling are carried out in accordance with the manuals "Methodology of field experiments" (Dospekhov, 1985), "Methods of state varieties of agricultural experiments" (1964) and "Methods of field experiments" (2007). Quantities of humus, general and mobile species of NPK in soil samples were carried out according to the methods "Methods of agrochemical, agrophysical and microbiological research in polyvinyl cotton fields" (1963) and "Methods of agrochemical analysis of soil and plants of Central Asia" (1977).

Analysis and results. Field experiments from 2017 until 2020 years were held on the farm "Sapargul Khasanova" in Khojayli district of the Republic of Karakalpakstan. The soil of the experimental field was meadow-alluvial, irrigated from scratch, with 0.797% humus in the plowed layer (0-30 cm), 0.075 and 0.063% of total nitrogen, total phosphorus and potassium, respectively, and N-NN4 -10.2 mg from the mobile forms of nutrients. / kg, N-NO3 -7.3 mg / kg, P2O5 -28 mg / kg and K2O -118 mg / kg. Hence, the soil of the experimental field is considered to be poorly supplied with nutrients.

Experiments on the optimal fertilization system for cotton planted the following year after the main sunflower and soybean crops grown through crop rotation systems in the alluvial soils of the Aral Sea irrigated meadow of the Republic of Karakalpakstan were carried out according to the following structure (Table 1).

Table-1

Cotton-related research experimental system, 2019

Options serial number	Past types of crops planted before cotton.	Annual norms of fertilizers applied to cotton, kg / ha			Use time, kg / ha							
		N	P ₂ O ₅	K ₂ O	Before the plow			Along with planting	Flower bud formation		Flowering	
					N	P ₂ O ₅	K ₂ O		N	N	K ₂ O	N
1	Sunflower	160	100	75	-	70	40	30	65	35	65	30
2		200	140	100	-	100	50	50	75	50	75	40

3		240	170	125	-	120	60	70	85	65	85	50
4	Soybean	160	100	75	-	70	40	30	65	35	65	30
5		200	140	100	-	100	50	50	75	50	75	40
6		240	170	125	-	120	60	70	85	65	85	50

In cotton, each variant is 4.8 m wide, 50 m long and has a total area of 120 m². The experiment was performed in 3 repetitions with a total area of 4320 m². The experiment area is initially divided into appropriate reversals and variants, and according to the experiment system, ammonium nitrate (34% N), urea (46% N), suprefos (N-10%, R2O5-22-23%) and potassium chloride (60% K₂O) minerals fertilizers were applied.

Experiments, phenological observations, soil and plant sampling were carried out on the basis of the manuals "Methodology of field experiments" (Dospekhov, 1985), "Methodology of the State variety for testing agricultural crops" (1964), "Methods of field experiments" (2007).

Quantities of humus, general and mobile species of NPK in soil samples were carried out according to the methods "Methods of agrochemical, agrophysical and microbiological research in watering cotton fields" (1963) and "Methods of agrochemical analysis of soil and plants of Central Asia" (1977).

We analyzed the nutrient content of the plant throughout the developmental stages of cotton and at the end of the application period (Table 2). NPK content per leaf is -1.61: 0.82: 0.81 in accordance with the norms of mineral fertilizers (N160P100K75, N200P140K100 and N240P170K125 kg.) applied at the end of the application period of the plant when caring for cotton after planting sunflowers; 1.63: 0.84: 0.84 and 1.65: 0.83: 0.83, respectively, these figures are 1.65: 0.77: 2.74; 1.65: 0.81: 2.75 and 1.68: 0.83: 2.75 per cent, 1.73: 1.11: 1.55 in cotton; 1.74: 1.14: 1.57; 1.75: 1.15: 1.58 percent and 1.43: 0.65: 1.24 in the bowl; 1.50: 0.67: 1.25; Was 1.51: 0.64: 1.23 percent.

Table-2

In plant organs according to the developmental phases of cotton amounts of NPK, in% (in the field planted with sunflowers)

Options serial number	The norm of mineral fertilizers applied to cotton, kg.	Periods of development											
		2-4 real leaves (28.05.19)		The period of flower bud formation (03.07.19)			flowering period, 23.07.19			end of validity, 03.09.19			
		Stem+leaf	leaf	Stem	Flower bud formation	Leaf	stem	Flower	Leaf	stem	Cotton	Cotton boll	
Nitrogen, %													
1	N ₁₆₀ P ₁₀₀ K ₇₅	2,68	3,87	2,90	3,71	3,45	2,81	3,70	1,61	1,65	1,73	1,43	
2	N ₂₀₀ P ₁₄₀ K ₁₀₀	2,75	3,85	2,90	3,74	3,42	2,85	3,74	1,63	1,65	1,74	1,50	
3		2,74	3,85	2,91	3,70	3,43	2,8	3,75	1,65	1,68	1,75	1,51	



	N ₂₄₀ P ₁₇₀ K ₁₂₅						0					
Phosphorus, %												
1	N ₁₆₀ P ₁₀₀ K ₇₅	1,67	2,20	1,43	2,18	2,21	1,60	2,32	0,82	0,77	1,11	0,65
2	N ₂₀₀ P ₁₄₀ K ₁₀₀	1,75	2,27	1,42	2,17	2,25	1,61	2,34	0,84	0,81	1,14	0,67
3	N ₂₄₀ P ₁₇₀ K ₁₂₅	1,76	2,27	1,43	2,20	2,24	1,62	2,34	0,83	0,83	1,15	0,64
Potassium, %												
1	N ₁₆₀ P ₁₀₀ K ₇₅	1,35	1,29	2,41	2,35	1,23	2,25	2,85	0,81	2,74	1,55	1,24
2	N ₂₀₀ P ₁₄₀ K ₁₀₀	1,37	1,30	2,43	2,34	1,26	2,26	2,86	0,84	2,75	1,57	1,25
3	N ₂₄₀ P ₁₇₀ K ₁₂₅	1,37	1,32	2,42	2,35	1,31	2,25	2,87	0,83	2,75	1,58	1,23

Relatively acceptable levels of NPK in plant organs by the developmental stages of cotton were observed in areas planted with shade as a past crop (Table 3).

That is, the amount of NPK in the leaves at the end of the application period of the plant is 1.62: 0.85: 0.84; While 1.63: 0.88: 0.86 and 1.65: 0.87: 0.87 percent, these figures are 1.73: 0.85: 2.75 in the base; 1.75: 0.87: 2.78 and 1.75: 0.87: 2.78 per cent, 1.75: 1.15: 1.55 in cotton; 1.77: 1.17: 1.59 and 1.76: 1.16: 1.62 percent and 1.47: 0.65: 1.26 in the bowl; 1.49: 0.67: 1.29 and 1.48: 0.68: 1.29 percent.

In the area of sunflower planted options, the cotton yield is characterized by lower yields than in the area planted to shade crops. We certainly associate this with the fact that the sunflower crop removes high amounts of nutrients from the soil.

That is, in the study, the highest cotton yield was observed in 5 variants (36.7 centner) where mineral fertilizers were applied at a high N₂₀₀P₁₄₀K₁₀₀ kg., norm in soybean-planted areas. Against the background of this crop, mineral fertilizers N₂₄₀P₁₇₀K₁₂₅ kg / ha were applied, and in 6 variants the cotton yield was 1.7 centner (35.0) less than in 5 variants.

In the area where sunflowers are planted, mineral fertilizers N₁₆₀P₁₀₀K₇₅, N₂₀₀P₁₄₀K₁₀₀ and N₂₄₀P₁₇₀K₁₂₅ kg., are applied to the cotton, and the cotton yield is 28.2; 30.9 and 31.7 centner respectively, in the areas where soybeans are planted, cotton is 6.7 compared to the options used in these norms; 5.8 and 3.3 centner respectively.

Therefore, it can be concluded that the application of the annual norm of cotton N₁₆₀R₁₀₀K₇₅ and N₂₀₀R₁₄₀K₁₀₀ kg / ha to the areas planted with shade as the main crop is highly cost-effective.

Conclusion / Recommendations.

1. In 2019 of the experiment, the amount of mineral nitrogen (N-NN₄ + N-NO₃) in the 0-30 cm layer of soil before planting cotton was 17.5 mg / kg in the area under winter wheat, 15.5 mg / kg in the area under sunflower, sesame seeds. mineral nitrogen in the 0-30 cm layer of soil (N-NN₄) depending on the norms of mineral fertilizers



- (N160P100K75, N200P140K100 and N240P170K125 kg / ha) applied at the end of the application period of cotton, when the area is 17.1 mg / kg and 18.5 mg / kg in the area planted with soybeans? + N-NO₃) is 19.8, 21.0 and 22.0 mg / kg in winter wheat, 22.7, 24.1 and 26.2 mg / kg in sunflower, 27.3 in sesame. 28.6 and 30.0 mg / kg and the highest values in the shade areas were 28.5, 30.6 and 32.2 mg / kg.
2. At the end of the cotton growing season, the highest dry mass in the area under winter wheat was 154.6 g / plant in 12 variants applied to N240P160K140 kg / ha, while the weight of cotton was 0.3 gram compared to the mineral fertilizer norm N200R140K100 kg / ha. was low. The norms of mineral fertilizers applied to cotton in the sown sesame area were slightly higher than the other options of N160P100K75, N200P140K100 and N240P170K125 kg / ha, but the dry mass of the plant was higher (136.5; 149.2 and 153.8 g / plant).
 3. The highest cotton yield in the area under winter wheat and sunflower was 33.2-31.7 centner in cotton varieties N240P160K140 kg. applied in options 3 and 6, while the norms of mineral fertilizers applied to cotton in the area sown sesame were N160P100K75, N200P140 It can be concluded that N240P170K125 kg. had a positive effect on the increase in cotton yield, albeit slightly compared to other options (29.3; 33.4 and 33.8 centner).
 4. When high-tech agro-techniques were applied to cotton fields in the following year, low norms of mineral fertilizers, not high norms, proved to be effective (34.9 centner in 10 variants applied to N160R100K75 kg , 36.7 in 11 variants fed to N200R140K100 kg. in 36 variants). ts / ha and 35.0 ts / ha of cotton were obtained in 12 variants fed with cotton at the rate of N240P160K140 kg. (Edited)Restore original

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