

# The Effectiveness Of Various Doses And Ratios Of Mineral Fertilizers On Soil Fertility And Cotton Yield.

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**Abstract:** *Studies Have Established That With The Adding Of Various Doses And Ratios Of Mineral Fertilizers In The Soil, The Content Of Assimilable Forms Of Nutrients Increases, Plants Most Often Use Them In The Early Period Of Growth And Development. The Increase In The Yield Of Raw Cotton, Depending On The Doses And Ratios Of Mineral Fertilizers, Reaches Up To 24.4 C / Ha. When Applying Nitrogen, Phosphorus And Potash Fertilizers At Doses Of N-250-275, P-180-200 And K-120-140 Kg / Ha With An NPK Ratio Of 1: 0.7: 0.5, An Increase In Yield And An Improvement In The Technological Qualities Of Fiber Was Observed*

**Key Words:** *Decreases, Optimal, Scientific, Sustainable, Saline With Carbonates, Promotes, Hot, Precipitation, Continental, Exposed, Seasonal, Compounds Absorption, Removal*

## 1. INTRODUCTION

In Modern Conditions, When Agriculture Of The Republic Of Uzbekistan Has Entered A New Stage Of Further Development, All Branches Of Crop Production. Since Scientists, Economists And Sociologists Around The World Are Intensively Searching And Developing Possible Ways To Provide Food And Industrial Goods To The Growing Population Of The Globe.

To Solve The Tasks Set, It Will Require A Significant Increase In The Yield Of All Agricultural Crops. Naturally, The Growth Of Yields And Gross Harvests Will Depend On The General Rise In The Culture Of Agriculture, The Introduction Of Mineral Fertilizers And Their Effective Use. Numerous Experiments Carried Out In Various Soil And Climatic Conditions Show That Half Of The Increase In The Yield Of Agricultural Crops Is Obtained Through The Use Of Mineral Fertilizers.

In This Regard, The President Of The Republic Of Uzbekistan Sh.M. Mirziyoyev And The Governments Of Uzbekistan Are Taking Decisive Measures To Further Expand The Production And Use Of Fertilizers In Our Republic. This Is Evidenced By The Decree Of The President Of The Republic No. PK-2640 Of October 24, 2016 "On Measures For Protecting Agricultural Crops And Improving Agrochemical Services" Resolution Of The Council Of Ministers Of The Republic Of Uzbekistan No. 03-12-7 Of December 26, 2016 "Comprehensive Measures And A Program On The Development Of A System For Servicing

Agriculture With Mineral Fertilizers, Chemical And Biological Plant Protection Products, Improving The Quality Of Agrochemical Services For Agriculture In 2017-2021", And Also In Other Regulatory Legal Documents Adopted In This Area.

It Should Be Noted That One Of The Most Important Conditions For Increasing The Productivity Of Agricultural Crops, In Particular Cotton, Is The Correct Establishment Of The Ratio Of Mineral Fertilizers In Annual Rates, Taking Into Account The Needs Of The Plants Themselves And Their Reserves In The Soil. At The Same Time, Not Only Does The Total Cotton Harvest Increase, But The Quality Of The Products Produced And The Net Income In Monetary Terms Also Increase.

Practice Shows That In The Farms Of The Surkhandarya Region In Recent Years, The Hectare Norms Of Mineral Fertilizers Have Been Decreasing, Their Effectiveness Is Very Low. This Is Due To The Fact That In The Planning Of Mineral Fertilizers In The Regional Farms, The Peculiarities Of The Culture, Soil And Climatic Conditions, The Ratio Of Mineral Fertilizers Are Not Taken Into Account And Often Resort To The Use Of High Doses Of Nitrogen Fertilizers Only, Which Remains Unjustified And Undesirable.

The Issues Of The Effectiveness Of Doses And Ratios Of Mineral Fertilizers On Medium Staple Cotton In The Conditions Of The Surkhandarya Region Have Not Been Studied At All. Therefore, It Became Necessary To Conduct Studies To Study The Effectiveness Of The Dose Of The Ratios Of Nutrients Of Mineral Fertilizers On Medium-Fiber Cotton, The Purpose Of Which Was To Establish The Optimal Rates Of Fertilizers And Ratios Between Nutrients For The Development Of Fertilizer Standards, In Order To Obtain High And Stable Yields Of Raw Cotton. Numerous Scientific Institutions And Researchers Have Been Studying The Establishment Of Optimal Norms And Ratios Of Nutrients Of Mineral Fertilizers For Cotton.

Their Research Found That For Medium-Fiber Varieties Of Cotton, The Optimal Annual Rate Is N-150-200 Kg, P<sub>2</sub>O<sub>5</sub>-90-120 Kg And K<sub>2</sub>O-50-100 Kg / Ha, While A Total Yield Was Obtained In The Range Of 25-30 C / Ha. In The Studies Of Belousov M.A., Protasov P.V., Madraimov I.I. And Others Found That The Optimal Annual Rate For Obtaining A High And Sustainable Yield Of Medium-Fiber Cotton Is N-180-200, P<sub>2</sub>O<sub>5</sub>-120-130 And K<sub>2</sub>O-100-120 Kg / Ha.

To Obtain High And Stable Yields Of Raw Cotton On Soils Salted With Calcium And Magnesium Corbanates, O. Saidmuradov Recommends Applying: N-200-250 Kg, P<sub>2</sub>O<sub>5</sub>-140-175 Kg And K<sub>2</sub>O-100-125 Kg / Ha At A NPK Ratio Of 1 : 0.7: 0.5. Mazhitov A Prove That The Annual Application Of 150 Kg / Ha Of Phosphorus Against The Background Of 200 Kg / Ha Of Nitrogen Turned Out To Be The Most Profitable And Cost-Effective.

Based On Many Years Of Research, Kholov G Suggests That To Obtain A High Yield Of Raw Cotton (50 C / Ha Or More) Fertilizers Should Be Applied At The Rate Of N-240, P<sub>2</sub>O<sub>5</sub>-170 And K<sub>2</sub>O-60 Kg / Ha With An NPK Ratio Of 1: 0 , 7: 0.25.

At The Same Time, The Maximum Income Is 1714 Rubles. Received From 1 Hectare.

P.V. Protasov And Others Believe That 15-20 Kg Of Phosphorus And 10-20 Kg / Ha Of Nitrogen Should Be Applied Before Sowing On All Types Of Soils Against The Background Of Cotton Old Grass. This Will Provide Cotton Plants With Nutrition From The Moment They Germinate, Promote Better Plant Development And Guarantee An Increase In Yield.

**Purpose Of The Study.** Surkhandarya Region Occupies An Extremely Southern Position Within Uzbekistan And Is Characterized By A Wide Variety Of Natural Conditions. The Territory Of The Region From The North-West And East Is Surrounded By Mountains, And In The South It Is Open To The Amu Darya River And The Deserts Of Afghanistan.

According To The Soil-Climatic Zoning Of Uzbekistan (Genusov, Gorbunov Kimberg 1960, 1961), The Studied Territory Is Located In The Southern Sub-Zone Of The Desert Zone. Its Climate Is Extra Arid, Characterized By Large Amplitudes In The Annual And Daily Temperature Variations, Very Hot Summers, Little Cloudiness And Air Humidity During The Summer, And A Low Amount Of Atmospheric Precipitation.

The Temperature Regime Is Characterized By High Performance. The Maximum Temperature On Some Summer Days Reaches 48-50°C, And The Minimum Is 14-15°C.

The Winds Of The South-West Direction Are Unfavorable, Causing Sand Storms That Cover The Sky With Yellow Haze Called "Afghan", Reaching Great Force In Open Places. Most Of Them Blow In Spring And Summer. In The Spring, These Winds Quickly Dry Up The Arable Layer Of Soil, Which Leads To Forced Recharge Irrigation. In Summer, Air Humidity Also Sharply Decreases, Evaporation And Transpiration Of Plants Increases. These Dusty Storms Happen 30-35 Times A Year.

The Distribution Of Precipitation In The Territory Of The Surkhandarya Region Is Diverse. Their Average Annual Number, According To Long-Term Agro-Climatic Data, Is 128-170 Mm, And They Fall Mainly In The Autumn-Winter-Spring Months.

Therefore, Without Irrigation In Such Soil And Climatic Conditions, It Is Impossible To Obtain Agricultural Products. Despite The Sharp Continentality, Weather Conditions, Timely And High-Quality Agrotechnical And The Use Of Fertilizers Can Be Grown And High Yields Of Medium Staple Cotton Can Be Obtained.

It Should Be Noted That In The Conditions Of The Surkhandarya Region, The Issue Of The Effectiveness Of Doses And Ratios Of Mineral Fertilizers On Medium Staple Cotton Has Not Been Studied. Therefore, Our Goal And Research Objectives Were Aimed At Solving The Above Issue On Medium Staple Cotton.

## 2. MATERIAL AND RESEARCH METHODS

In Order To Study The Effectiveness Of Doses And Ratios Of Mineral Fertilizers On Medium Staple Cotton, We Carried Out An Irrigation Experiment At The Experimental Base Of The Surkhandarya Experimental Cotton Growing Station Against The Background Of Old Cotton Plow.

The Experiment Was Carried Out According To The Scheme Presented In Table 1.

The Experiment Was Repeated Four Times. The Shape Of The Plots Is Elongated, Their Width, As A Rule, Was Two Runs Of A Four-Row Cotton Seeder And Tillage Machines, Which, When Sowing With A Row Spacing Of 60 Cm, Was 4.8 Meters. The Total Area Of The Plots Was  $100 \times 4.8 = 480 \text{ M}^2$ . On Each Plot Of Experiments, 4 Of 8 Rows Were Used As Registration Ones. The Accounting Area Of The Plots Was  $100 \times 2.4 = 240 \text{ M}^2$ .

Fertilizers Were Applied According To The Scheme Of The Experiment: For Plowing, By Hand Scattering Over The Surface Of The Field, Followed By Their Incorporation With A Plow To A Depth Of 38-40 Cm. Subsequent Periods Of Fertilization Were Applied As Follows.

Table 1  
 Experience Scheme

NN Options	Annual Fertilizer Rate, Kg / Ha	Fertilization Terms, Kg / Ha					
		For Plowing	Before Sowing	With Sowing	At 3- 4x	Into Budding	Into Bloom

						g				Real Leaves			
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O	N	N	P <sub>2</sub> O <sub>5</sub>	N	N	K <sub>2</sub> O	N	P <sub>2</sub> O <sub>5</sub>
<b>1</b>	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>2</b>	-	150	112	90	62	-	-	20	-	-	50	-	40
<b>3</b>	22 5	-	112	-	62	-	2 0	-	50	8 0	50	7 5	-
<b>4</b>	22 5	150	-	90	-	-	2 0	20	50	8 0	-	7 5	40
<b>5</b>	22 5	120	112	60	62	-	2 0	20	50	8 0	50	7 5	40
<b>6</b>	22 5	150	112	90	62	-	2 0	20	50	8 0	50	7 5	40
<b>7</b>	22 5	180	112	120	62	-	2 0	20	50	8 0	50	7 5	40
<b>8</b>	22 5	210	112	150	62	-	2 0	20	50	8 0	50	7 5	40
<b>9</b>	25 0	120	125	60	75	25	2 0	20	50	8 0	50	7 5	40
<b>10</b>	25 0	150	125	90	75	25	2 0	20	50	8 0	50	7 5	40
<b>11</b>	25 0	180	125	120	75	25	2 0	20	50	8 0	50	7 5	40
<b>12</b>	25 0	210	125	150	75	25	2 0	20	50	8 0	50	7 5	40
<b>13</b>	27 5	120	140	60	90	50	2 0	20	50	8 0	50	7 5	40
<b>14</b>	27 5	150	140	90	90	50	2 0	20	50	8 0	50	7 5	40
<b>15</b>	27 5	180	140	120	90	50	2 0	20	50	8 0	50	7 5	40
<b>16</b>	27 5	210	140	150	90	50	2 0	20	50	8 0	50	7 5	40
<b>17</b>	30 0	210	140	150	90	50	2 0	20	50	8 0	50	7 5	40

Simultaneously With Sowing With A Cultivator - Fertilizer Of The Krkh - 4 Brand In A Unit With A Sktkh Cotton Seeder, Visited On A T-28-X Row-Crop Tractor. During Sowing, Fertilizers Were Embedded 5-7 Cm To The Side Of The Seeding Line And To A Depth Of 10-12 Cm From The Soil Surface. With 3-4 True Leaves, Feeding Was Carried Out On The Side Of The Row By 15-18 Cm, At The Beginning Of Budding By 20-22 Cm And At The Beginning Of Flowering - In The Middle Of The Row Spacing. During The Growing Season Of Cotton In All Periods, Fertilizers Were Applied To A Depth Of 3-4 Cm Below The Level Of The Irrigation Furrow. Experimentally, Medium Staple Cotton Of Bukhara - 6 Variety Was Sown.

For The Agrochemical Characteristics Of The Experimental Plot, Before The Foundation Of The Experiment, Soil Samples Were Taken, In Which The Content Of Humus, Nitrate Nitrogen, Mobile Phosphorus And Exchangeable Potassium Was Determined.

The Content Of Nutrients In The Soil Of The Experimental Plot Are Given In Table 2.

Table 2  
**Agrochemical Characteristics Of The Soil Of The Experimental Site**

Horizons, Cm	Nutrient Content			
	In Percents	In Mg Per Kg Of Soil		
	Humus	Nitrate Nitrogen	Mobile Phosphorus	Exchangeable Potassium
0-30	1,35	11,8	23,0	165
30-50	1,13	9,7	19,5	150

From The Data In Table 2, It Can Be Seen That The Soil Of The Experimental Plot Before Laying The Experiment Is Characterized By A Low Content Of Nitrate Nitrogen, Mobile Phosphorus And Exchangeable Potassium.

The Selection Of Soil And Plant Samples And Agrochemical Analyzes In The Experiment Were Carried Out According To The Methodology Of The Soyuz Niikh, Now Uz Niikh, Set Forth In The Book "Methods Of Agrochemical Analysis Of Soil And Plants" Of Central Asia (1977).

Phenological Observations Of The Growth And Development Of Cotton Were Carried Out According To The Methodology Of The Union NIIH Now Uz NIIH, Set Out In The Book "Methodology Of Field And Vegetation Experiments With Cotton Under Irrigation" (1977, 1981). "Methods Of Conducting Field Experiments" (T.2007 Y)

On The Variants Of The Experiment, The Height Of The Main Stem Was Measured By The Phases Of Development, The Number Of True Leaves, Fruit Nodes, Fruit Of Elements And Formed Bolls On Plants Was Taken Into Account. Before Each Harvest, The Average Weight Of Raw Cotton Of One Boll Was Determined. At The End Of The Growing Season Of Cotton, The Actual Density Of The Standing Of The Cotton Was Determined By Total Counting Of All Plants On The Registration Rows Of All Plots And Repetitions Of The Experiment.

The Harvest Of Raw Cotton Was Taken Into Account That Were Picked By Hand On The Accounting Rows Of All Plots Of The Experiment.

The Yield Data Were Subjected To Mathematical Processing In Order To Assess The Accuracy And Reliability Of The Results Obtained According To The Method Proposed By Dospekhov (1985). "Methodology Of Field Experiments" (1985).

### 3. RESEARCH RESULTS AND THEIR DISCUSSION

One Of The Main Indicators Of Cotton Response To Nutritional Conditions Is Plant Growth And Development.

The Results Of Accounting For The Growth And Development Of Cotton, Shown In Table 3, Show That Fertilizers, The Independence Of The Doses And Ratios Used, Had A Positive Effect On The Growth And Development Of Plants In Comparison With The Control Without Fertilizers.

In The Variant Where Phosphorus And Potash Fertilizers (Var. 2) Were Applied, The Plants Had A Slightly Higher Height Of The Main Stem, The Number Of Fruit Elements And Capsules Compared To The Control. In The Options Without Phosphorus (Option 3) And Without The Introduction Of Potassium (Option 4), The Growth And Development Of Cotton Were Less Than In Other Options Of The Experiment.

The Highest Plant Growth Was Noted With The Introduction Of Nitrogen 300, Phosphorus 120 And Potassium 140 Kg / Ha, With A Ratio Of Nitrogen To Phosphorus And Potassium Equal To 1: 0.7: 0.44 (Version 17). More Favorable Conditions For The Growth And Development Of Plants Are Created With The Introduction Of N-250-275, P2O5-180-210 And K2O-125-140 Kg / Ha, With An NPK Ratio Of 1: 0.7: 0.5 And 1: 0.76 : 0.5.

The Smallest Growth In The Set Of Fruits About Elements And Capsules Was Observed In The Variants With The Application Of 225 Kg Of Nitrogen And 112 Kg / Ha Of Potassium At Various Doses Of Phosphorus. With An Increase In The Dose Of Nitrogen To Phosphorus, Their Effect On The Growth And Development Of Cotton Changed.

For Example: When Applying N-250, P2O5-180-210 And K2O-125 Kg / Ha, Compared With The Application Of N-225, P2O5-180-210 And K2O-112 Kg / Ha, The Growth Of Plants, The Number Of Fruit Branches And Bolls Increased. An Increase In The Nitrogen Dose To 275 Kg / Ha Was Also Accompanied By A Natural Acceleration Of Plant Growth And An Increase In Fruiting. Consequently, Mineral Fertilizers Had A Positive Effect On The Formation Of Bolls On Plants.

It Should Be Noted That A Smaller Number Of Boxes Accumulated In The Control Variant, 7.8 Pieces.

The Largest Number Of Bolls Was Formed In The Variants Where The Highest Doses Of Mineral Fertilizers Were Applied.

Establishing The Dynamics Of Mobile Nutrients In The Soil, Depending On The Application Of Various Doses Of The Ratios Of Mineral Fertilizers, Is Of Great Importance In A Particular Soil-Climatic Zone Of Cotton Growing For Their Correct And Effective Use.

Seasonal Dynamics Of Soil Nutrients Is Influenced By A Complex Interaction Of Various Factors. On The One Hand, It Is Influenced By Factors That Contribute To The Accumulation Of Mobile Compounds Of Nitrogen, Phosphorus And Potassium, In Particular The Application Of Fertilizers, Favorable Course Of Microbiological Processes, And On The Other Hand, Factors That Reduce The Content Of Nutrients In The Soil. These Factors Include Their Consumption By Plants, The Absorption Of The Applied Fertilizers By The Soil, Leaching, Etc.

Table 3  
 Influence Of Doses And Ratios Of Mineral Fertilizers  
 For The Growth And Development Of Cotton

NN Options	Main Stem Height, Cm	Number Of True Leaves, Pieces	Number Of Fruit Branches, Pcs	Number Of Fruit Elements, Pcs	Number Of Boxes, Pcs	Including Opened, Pcs
1	60,3	8,7	11,0	15,2	7,8	3,2
2	73,0	9,3	11,8	17,5	8,1	3,5
3	83,9	10,8	12,1	18,2	9,3	4,2
4	85,1	10,8	12,9	18,4	10,4	4,0
5	88,0	10,4	13,1	18,7	10,6	4,3
6	89,2	11,2	13,8	20,3	11,2	4,2

7	89,7	10,9	14,1	21,5	11,3	4,5
8	90,6	11,5	14,5	23,8	11,8	4,0
9	89,0	11,3	14,2	22,9	11,7	3,8
10	90,1	11,1	14,4	24,2	12,1	4,1
11	92,9	12,0	14,8	24,5	12,4	4,0
12	93,6	12,6	15,2	25,0	12,6	3,9
13	92,3	13,3	14,2	23,8	12,8	3,7
14	92,5	13,3	15,1	25,4	13,1	3,9
15	96,3	13,3	15,4	25,8	13,4	4,4
16	98,4	13,4	15,7	26,2	13,8	4,1
17	100,0	13,9	16,4	27,5	13,2	3,8

The Results Of Studies On The Study Of The Seasonal Dynamics Of Nitrate Nitrogen In The Soil, Given In Table 4, Showed That The Application Of Fertilizers Contributed To A Sharp Increase In Nutrients In The Soil, Both In The Arable And Subsoil Horizons. It Should Be Noted That The Nitrogen Content Of Nitrates In The Soil Is Closely Related To The Level Of Applied Doses Of Fertilizers. Therefore, In Comparison With The Option Without Fertilizers, As The Level Of Nutrition Increases, The Content Of Nitrogen And Nitrates In The Soil Increases. This Can Be Clearly Seen At The Beginning Of The Cotton Growing Season.

The Results Of Agrochemical Analyzes Have Shown That The Content Of Nitrate Nitrogen In The Soil Depends On The Level Of Nitrogen Fertilization. Consequently, With An Increase In The Nitrogen Dose In Almost All Variants Of The Experiment, The Content Of Nitrate Nitrogen In The Soil Increased. The Study Of The Seasonal Dynamics Of Nitrate Nitrogen In The Variants Studied Made It Possible To Establish That The Application Of Nitrogen Fertilizers The Nitrate Accumulation Process From Spring To Summer Is Activated, And At The End Of The Growing Season It Decreases, Which Is Associated With The Attenuation Of The Nitrification Process And The Increased Use Of It By Cotton.

Table 4  
 The Content Of Nitrate Nitrogen In The Soil Depending On The Doses And Ratios Of Mineral Fertilizers

NN Options	Nitrate Nitrogen Content, Mg / Kg Soil							
	With 3-4 <sup>x</sup> True Leaves		Into Budding		Into Bloom		At The End Of The Growing Season	
	Horizons, Sm							
	0-30	30-50	0-30	30-50	0-30	30-50	0-30	30-50
1	7,4	5,3	8,1	6,4	6,4	5,1	4,5	2,8
2	8,1	6,4	8,5	6,0	6,7	5,3	5,1	3,1
3	23,5	12,3	26,3	14,4	19,8	8,1	12,7	6,4
4	22,0	12,8	28,2	15,1	20,6	8,6	13,2	6,7
5	23,2	13,6	29,2	16,2	21,2	8,7	13,6	7,4
6	25,1	12,7	29,7	17,6	20,5	9,5	13,5	7,4
7	24,3	13,2	30,1	16,5	19,8	8,9	13,9	6,7
8	24,6	13,6	29,2	17,5	22,0	9,4	13,2	7,8
9	28,2	15,1	32,5	18,4	25,1	9,9	14,4	8,7

10	26,3	16,2	34,0	19,1	25,8	11,3	14,3	9,2
11	29,2	17,6	33,9	17,6	24,9	10,8	15,1	9,1
12	27,3	16,5	34,5	18,8	26,1	11,3	15,5	8,9
13	32,5	19,1	36,7	20,6	27,3	12,7	15,8	9,4
14	33,9	18,4	38,2	21,2	26,1	13,6	17,6	9,9
15	35,5	17,6	37,0	22,0	27,0	14,0	16,9	10,3
16	35,3	18,3	36,8	22,6	28,2	13,2	16,5	10,8
17	38,2	19,1	39,7	22,9	30,1	15,1	18,4	11,3

The Data Of Analyzes Of Phosphorus Soluble In 1% Ammonium Carbon Extract Showed That The Content Of Mobile Phosphates In The Soil Is Directly Dependent On The Applied Norms Of Phosphorus Fertilizers. Consequently, The Introduction Of Phosphorus Fertilizers On Soils Containing 23.0 Mg / Kg Of Soil Of Mobile Phosphorus Significantly Increases The Concentration Of Phosphoric Acid In The Soil (Table 5). Observations Of The Dynamics Of Mobile Phosphorus Showed Differences In Their Content At Different Periods Of Cotton Development And Depending On The Rates Of Phosphorus Fertilizers. Consequently, The Highest Content Of Assimilable Phosphorus Is Observed In The Spring-Summer Period In The Initial Phases Of Cotton Development, In Subsequent Periods The Content Of Assimilable Phosphorus Gradually Decreases. This Is Due To The Absorption Of Phosphorus By The Soil And Its More Intensive Consumption By Plants

Table 5  
 The Content Of Mobile Phosphorus In The Soil Depending On The Doses And Ratios Of Mineral Fertilizers

NN Options	Nitrate Nitrogen Content, Mg / Kg Soil							
	With 3-4 <sup>x</sup> True Leaves		Into Budding		Into Bloom		At The End Of The Growing Season	
	Horizons, Sm							
	0-30	30-50	0-30	30-50	0-30	30-50	0-30	30-50
1	17,5	13,8	16,1	13,0	14,2	12,6	13,4	11,0
2	34,6	18,6	36,2	18,9	31,7	16,1	26,4	15,0
3	18,2	14,2	17,9	15,0	15,8	13,4	13,8	12,2
4	35,0	17,9	37,5	19,3	32,1	16,5	27,2	16,1
5	31,7	15,8	33,4	16,5	31,3	14,2	25,0	13,4
6	36,2	18,2	35,8	19,6	33,4	16,8	25,9	14,6
7	38,7	19,6	40,0	20,3	38,7	17,9	28,8	16,8
8	42,0	20,8	42,6	21,6	39,6	18,9	31,7	17,2
9	30,0	16,1	32,1	16,8	30,0	13,8	24,1	13,0
10	37,5	19,3	38,7	20,3	34,2	17,2	26,0	15,7
11	39,4	21,6	41,4	22,4	37,5	19,3	28,0	16,7
12	40,7	22,4	43,8	23,3	41,4	18,6	30,0	17,5
13	32,1	15,0	34,2	16,5	31,7	14,6	23,3	13,4
14	42,6	20,0	43,2	21,6	33,8	16,5	25,5	19,4
15	41,4	23,3	43,8	24,1	36,2	18,2	27,6	16,5
16	41,9	21,3	44,4	23,8	40,0	17,5	28,0	16,8
17	43,2	24,1	44,6	22,4	42,0	19,6	28,8	17,9



To Study The Effect Of Doses And Ratios Of Mineral Fertilizers On The Use Of Nutrients By Cotton, With 3-4 True Leaves And At The End Of The Growing Season, Plant Samples Were Taken And The Content Of Nitrogen And Phosphorus Was Determined In Them (Table 6).

Agrochemical Analyzes Of Cotton Plants Shown In Table 7 Show That The Smallest Amount Of Nitrogen And Phosphorus Is Contained In The Plants Of The Control Variant Without Fertilization (Var. 1). Plants Grown In Variants With Sufficient Nutrients Accumulated More Nitrogen And Phosphorus. The Opposite Picture Is Observed When One Of The Elements Is Excluded From The Composition Of The Complete Mineral Fertilizer (Options 2, 3 And 4).

Plant Analyzes Carried Out In A Field Experiment On Takyr-Meadow Soils Showed That The Content Of Nitrogen And Phosphorus In Cotton Depends On The Level Of Nutrition, I.E. From Doses And Ratios Of Mineral Fertilizers. Consequently, The Greatest Amount Of Nitrogen And Phosphorus Is Observed When Nitrogen Is Applied At 250-275-300 Kg / Ha And Phosphorus Is 180-210 Kg / Ha. At The End Of The Growing Season Of Cotton, The Highest Content Of Nitrogen And Phosphorus Accumulates In Raw Cotton. This Is Due To The Outflow Of Nutrients From The Vegetative Organs To The Reproductive Organs.

Table 6  
**Influence Of Doses And Ratios Of Mineral Fertilizers On The Accumulation Of Dry Matter In Cotton (Grams Per Plant)**

NN Options	With 3-4 <sup>x</sup> True Leaves	At The End Of The Growing Season				
		Leaves	Stem	Sash	Raw Cotton	Whole Plant
1	0,61	23,4	22,8	14,6	31,2	92,0
2	0,62	25,2	23,6	15,4	38,8	103,0
3	0,70	30,4	27,7	20,7	43,7	122,5
4	0,73	32,8	26,3	21,3	49,9	150,3
5	0,74	30,7	30,5	20,2	51,9	133,3
6	0,75	32,6	31,7	21,0	56,0	141,3
7	0,76	33,4	32,6	21,7	56,5	144,2
8	0,78	33,5	32,8	22,0	60,1	148,4
9	0,83	37,3	34,4	24,2	57,3	153,2
10	0,86	38,1	35,2	24,7	59,2	157,2
11	0,85	37,8	38,3	25,0	62,0	163,1
12	0,89	38,2	39,0	25,4	64,2	166,8
13	0,89	42,6	38,4	26,0	64,0	171,0
14	0,92	43,1	39,6	26,6	65,5	174,8
15	0,94	44,8	40,2	27,1	69,6	181,7
16	0,96	45,2	40,8	27,4	71,7	185,1
17	0,98	46,7	42,0	28,1	68,6	185,4

Before Each Harvest, Samples Of Raw Cotton Were Collected To Determine The Average Weight Of Raw Cotton Per Boll By Selecting Opened Bolls From 50 Accounting Plants From The Plot. The Results Of Determining The Average Weight Of Raw Cotton Of

One Box, Shown In Table 8, Show That The Smallest Total Raw Cotton Of One Box Was Obtained In The Control Variant (Option 1) And Averaged 4.0 Grams From 4x Harvests. The Largest Mass Of Raw Cotton Of One Boll Was Obtained In The Variants Where N-275-300, P2O5-180-210, K2O-140 Kg / Ha Were Introduced. In These Variants, The Average Weight Of One Box Was Up To 5.2 Grams. It Should Be Noted That The Application Of Fertilizers In Doses Of N-275-300, P2O5-180-210, K2O-140 Kg / Ha Contributed To An Increase In The Mass Of Raw Cotton Per Boll Compared To The Control To 1.2 Grams. All Studied Doses And Ratios Of Fertilizers Had A Positive Effect On The Formation Of The Yield Of Raw Cotton. Consequently, Mineral Fertilizers Provided An Increase In The Yield Of Raw Cotton On Average From 4 Harvests By 5.8-24.4 C / Ha With A Yield In The Control Of 23.2 C / Ha.

Table 7  
**Influence Of Doses And Ratios Of Mineral Fertilizers On The Supply Of Nutrients In Cotton. (Average Per Plant Percentage)**

NN Options	Percentage Of Nitrogen And Phosphorus					
	With 3-4 <sup>x</sup> True Leaves		At The End Of The Growing Season			
			Vegetative Organs		Raw Cotton	
	Nitrogen	Phosphorus	Nitrogen	Phosphorus	Nitrogen	Phosphorus
1	2,928	0,647	0,680	0,224	0,810	0,595
2	3,110	0,720	0,688	0,317	0,850	0,520
3	3,192	0,627	0,890	0,225	1,720	0,414
4	3,142	0,730	0,910	0,321	1,780	0,532
5	3,191	0,672	0,970	0,296	1,792	0,670
6	3,122	0,710	0,992	0,334	1,802	0,690
7	3,151	0,710	1,010	0,345	1,820	0,700
8	3,091	0,835	1,110	0,347	1,840	0,710
9	3,232	0,670	0,990	0,300	1,870	0,680
10	3,213	0,750	1,020	0,338	1,892	0,712
11	3,231	0,782	1,045	0,344	1,903	0,720
12	3,222	0,845	1,118	0,345	1,914	0,722
13	3,446	0,680	1,048	0,275	1,894	0,654
14	3,436	0,792	1,076	0,322	1,925	0,692
15	3,446	0,835	1,127	0,321	1,938	0,722
16	3,414	0,855	1,135	0,357	1,972	0,752
17	3,518	0,864	1,146	0,362	1,985	0,758

It Should Be Noted That The Yield Of Raw Cotton In The Variant Without Fertilizers Was Quite High, 23.2 C / Ha. The Yield In The Control Without Fertilizers Indicates The Potential Soil Fertility And The Aftereffect Of The Previously Applied Fertilizers.

The Results Of Accounting For The Yield Of Raw Cotton Given In Table 8 Show That The Application Of Phosphorus-Potassium Fertilizers Increased The Yield Of Raw Cotton To 5.8 C / Ha, Compared With The Options Without Fertilization.

A Great Effect Is Obtained From Nitrogen-Potassium Fertilizers In Comparison With Phosphorus-Potassium Fertilizers. With The Application Of 225 Kg / Ha Of Nitrogen

Against The Background Of 112 Kg / Ha Of Potassium (Var. 3), The Yield Increased In Comparison With The Control By 9.9 C / Ha. Higher Yields Were Obtained With The Introduction Of Nitrogen, Phosphorus And Potash Fertilizers. As The Nitrogen Dose Increases, The Yield Also Grows, But The Increase Is In Direct Proportion To The Ratio To Phosphorus. With A Nitrogen Dose Of 225 Kg / Ha And Phosphorus Of 120 Kg / Ha, The Cotton Yield Was 36.2 C / Ha, And With An Increase In The Phosphorus Dose To 150, 180 And 210 Kg / Ha, The Cotton Yield Was 36.9, 37.5 And 38, Respectively. , 3 C / Ha. This Pattern Is Also Observed At A Nitrogen Dose Of 250, 275 And 300 Kg / Ha.

Table 8  
**Efficiency Of Doses And Ratios Of Mineral Fertilizers For The Yield Of Raw Cotton, C / Ha**

NN Options	Yield Of Raw Cotton For Collection, C / Ha				Average Weight Of Raw Cotton Per Box Gram	Average Yield From 4 Harvests Q / Ha	Increase In Yield From Fertilizers C / Ha
	1rd Collection 7.IX	2rd Collection 23.IX	3rd Collection 4.X	4th Collection Of Ham 15.XI			
1	10,8	8,2	4,0	0,2	4,0	23,2	-
2	13,1	10,8	4,3	0,8	4,8	29,0	5,8
3	14,5	11,9	5,5	1,2	4,7	33,1	9,9
4	15,3	12,8	6,2	1,2	4,8	35,5	12,3
5	14,6	13,3	7,1	1,2	4,9	36,2	13,0
6	14,1	15,4	6,1	1,3	5,0	36,9	13,7
7	15,8	13,5	6,9	1,3	5,0	37,5	14,3
8	13,7	15,4	7,8	1,4	5,1	38,3	15,1
9	13,7	15,4	8,4	1,7	4,9	39,2	16,0
10	15,0	16,5	6,5	1,7	4,9	39,7	16,5
11	15,5	15,6	7,9	1,6	5,0	40,6	17,4
12	14,5	16,0	9,1	1,8	5,1	41,4	18,2
13	13,5	18,3	8,8	1,9	5,0	42,5	19,3
14	14,9	17,6	8,7	2,0	5,0	43,2	20,0
15	16,3	18,5	9,7	2,2	5,2	46,7	23,5
16	15,3	19,4	10,3	2,2	5,2	47,2	24,0
17	14,0	18,7	12,3	2,6	5,2	47,6	24,4

Consequently, An Increase In The Nitrogen Dose To 250, 275 And 300 Kg / Ha Was Accompanied By A Further Increase In The Yield Of Raw Cotton.

The Highest Yield Of Raw Cotton In The Experiment (47.2-47.6 C / Ha) Was Obtained On Variants Where 275-300 Kg / Ha Of Nitrogen, 210 Kg / Ha Of Phosphorus And 140 Kg / Ha Of Potassium Were Applied, With The Corresponding NPK, Equal To 1: 0.76: 0.5 And 1: 0.7: 0.46, Respectively.

It Should Be Noted That The Most Acceptable Dose Of Mineral Fertilizers For Obtaining A High, Possibly Economically Profitable Yield Of Raw Cotton With The Rate Of N-250-275, P2O5-180-210 And K2O-120-140 Kg / Ha With A Ratio Of 1: 0.7: 0.5.

The Total Removal Of Nitrogen And Phosphorus By Cotton Depends On Many Factors, Which Are: The Degree Of Soil Supply With Nutrients, The Biological

Characteristics Of Individual Crops And Their Composition, The Properties Of Various Types And Forms Of Fertilizers, Soil Treatment, The Height Of The Crop, The Weight Of The Vegetative Mass And The Percentage Of Nutrients In Plants.

Based On The Data Obtained On The Accumulation Of Dry Matter And The Content Of Nitrogen And Phosphorus In It, The Removal Of Nitrogen And Phosphorus Was Determined Per 1 Ton Of Raw Cotton.

The Data Obtained On The Assimilation Of Nitrogen And Phosphorus By Cotton, As Well As On Their Consumption For The Formation Of One Ton Of Raw Cotton, Presented In Table 9, Show That The Removal Of Nitrogen And Phosphorus By Cotton Varies Depending On The Yield Level. From The Data In Tables 9, It Can Be Seen That On The Takyr-Meadow Soil, Medium-Fiber Cotton Of The Bukhara-6 Variety Removed From The Soil In The Control Variant 22.0 Kg Of Nitrogen, 9.4 Kg Of Phosphorus, While On The Fertilized Variants With Nitrogen, Phosphorus And Potassium These Indicators Increased: Nitrogen To 39 , 6-48.0, Phosphorus Up To 15.0-24.4 Kg, Which, Respectively, 17.6-26.0 Kg Of Nitrogen And 5.6-15.0 Kg More Phosphorus Removed From The Soil Compared To The Control. The Greatest Removal Of Nitrogen And Phosphorus Was Noted In The Variants Where 250-275-300 Kg / Ha Of Nitrogen, 180-210 Kg / Ha Of Phosphorus And 125-140 Kg / Ha Potassium.

Improving The Technological Properties Of The Fiber Of The Grown Crop Of Raw Cotton Is Of Great Importance For The Textile Industry.

Table 9  
**The Yield Of The Main Nutrients Depending On The Doses And Ratios Of Mineral Fertilizers**

NN Options	Annual Norm Of Nutrients, Kg / Ha			Nitrogen Removed Per 1 Ton Of Raw Cotton, Kg	Phosphorus Removed Per 1 Ton Of Raw Cotton, Kg	Fertilizer Utilization Rate, %	
	N	P <sub>2</sub> O <sub>5</sub>	K <sub>2</sub> O			Nitrogen	Phosphorus
1	-	-	-	22,0	9,4	-	-
2	-	150	112	22,0	11,6	-	-
3	225	-	112	37,2	9,3	26,1	-
4	225	150	-	39,1	12,5	33,1	9,0
5	225	120	112	39,6	13,5	35,2	15,0
6	225	150	112	41,4	14,0	39,3	14,0
7	225	180	112	42,5	15,4	42,3	15,0
8	225	210	112	44,2	15,4	46,6	13,3
9	250	120	125	42,9	14,3	41,6	21,1
10	250	150	125	44,1	15,6	44,4	20,8
11	250	180	125	45,8	16,2	48,6	19,3
12	250	210	125	47,4	16,3	52,8	17,5
13	275	120	140	46,5	14,1	48,5	24,4
14	275	150	140	46,4	15,1	49,3	23,0
15	275	180	140	45,7	14,9	54,2	21,4
16	275	210	140	47,0	16,4	57,3	22,1
17	300	210	140	48,0	16,7	54,7	23,2

Table 10  
**The Effectiveness Of Doses And Ratios Of Mineral Fertilizers On The Technological Qualities Of Fiber**

NN Options	Industrial Grade	Fiber Breaking Load, G.S.	Metric Number	Maturity Rate	Breaking Length Of Fiber In Km
1	11	4,3	6090	1,9	26,2
2	11	4,1	6240	1,9	25,6
3	1	4,5	5900	2,0	26,6
4	1	4,4	6010	2,0	26,4
5	1	4,5	5920	2,0	26,6
6	1	4,4	5960	2,0	26,2
7	1	4,5	5840	2,0	26,3
8	1	4,4	5940	2,0	26,1
9	1	4,5	5820	2,0	26,2
10	11	4,3	6050	1,9	26,0
11	1	4,5	5860	2,0	26,4
12	1	4,6	5800	2,0	26,7
13	1	4,7	5650	2,0	26,6
14	1	4,5	5860	2,0	26,4
15	1	4,5	5860	2,0	26,4
16	1	4,6	5740	2,0	26,4
17	1	4,5	5920	2,0	26,6

To Clarify The Effect Of Doses And Ratios Of Mineral Fertilizers, The Technological Qualities Of The Fiber Were Determined Experimentally.

The Data Given In Table 10 Show That The Application Of Various Doses And Ratios Of Mineral Fertilizers Improves The Technological Qualities Of Cotton Fiber Compared To Options Without Fertilization.

It Should Be Noted That In The Variants Where Nitrogen 250-275 Kg / Ha, Phosphorus 180-210 Kg / Ha, And Potassium 125-140 Kg / Ha Were Introduced With An NPK Ratio Of 1: 0.7: 0.5, The Technological Qualities Of Cotton Fiber Improve. Compared To Other Experiences.

Based On The Investigations Carried Out, The Following Conclusions Can Be Drawn:

1. On The Takyr-Meadow Soils Of The Surkhondarya Region, The Application Of Mineral Fertilizers Had A Positive Effect On The Growth And Development Of Cotton.
2. With The Introduction Of Various Doses Of Mineral Fertilizers In The Soil, The Content Of Mobile Forms Of Nutrients Increases; Plants Use Most Of Them In The Early Period Of Growth And Development.
3. Due To The Introduction Of Mineral Fertilizers Under Cotton, The Amount Of Nutrients In The Soil Increases.
4. On Takyr-Meadow Soil, The Application Of Nitrogen-Potassium Fertilizers Turned Out To Be More Effective Than The Application Of Phosphorus-Potassium Fertilizers.

5. An Increase In The Norms Of Mineral Fertilizers Has A Direct Effect On The Supply Of Nutrients To The Plant Of Nitrogen And Phosphorus. In This Regard, The Consumption Of Nutrients For The Formation Of 1 Ton Of Raw Cotton Increases.
6. The Increase In The Yield Of Raw Cotton, Depending On The Doses And Ratios Of Mineral Fertilizers, Reaches Up To 24.4 C / Ha.
7. When Applying Nitrogen, Phosphorus And Potash Fertilizers At Doses Of N-250-275, P<sub>2</sub>O<sub>5</sub>-180-200 And K<sub>2</sub>O-125-140 Kg / Ha With An NPK Ratio Of 1: 0.7: 0.5, An Increase In Yield And An Increase In Technological Qualities Of Cotton Fiber.

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