SCIENTIFIC BASIS OF CROP ROTATION

ISBN: 978-81-949597-4-8

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Published by

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Maharashtra, India-411030
Website: www.novateurpublication.com

ISBN: "978-81-949597-4-8"

MINISTRY OF AGRICULTURE OF THE REPUBLIC OF UZBEKISTAN
CENTER FOR RESEARCH AND PRODUCTION OF AGRICULTURE AND FOOD SUPPLY

SCIENTIFIC RESEARCH INSTITUTE OF COTTON BREEDING, SEED PRODUCTION AND AGROTECHNOLOGIES

B.M.KHALIKOV, S.T.NEGMATOVA, SH.E.AKHMEDOV, R.A.NIZOMOV.

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India-2021
Novateur Publications,
Address: 466, Sadashiv Peth, Pune, Maharashtra, India-411030
Website: www.novateurpublication.com
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Scientific basis of crop rotation. Monograph-India. Novateur Publication, India 2021, 220.-pages

In this book, the history of the agricultural system and crop rotation, the importance of crop rotation, the method of conducting scientific research on crop rotation, the mode of application in production, as well as the prospects of crop rotation in agriculture of the Republic are mentioned. The book is intended for a wide audience of agricultural specialists, teachers and students of universities, institutes and colleges, as well as readers.

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This book is recommended to be published by the decision of the Scientific Council of the Research Institute of Agrotechnologies of cotton selection, seed production and cultivation on November 24, 2015 №10.

ISBN: “978-81-949597-4-8”

First Published in 2021

ISBN: "978-81-949597-4-8"

Novateur Publication
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INTRODUCTION

The socio-economic policy pursued by the government of the Republic of Uzbekistan aimed at the liberalization of all spheres of public life requires the regulation of land relations, the creation of favorable conditions for increasing the level of productive use of land resources.

In the years of independence,the country has successfully solved the primary task of providing the population with a sufficient amount of food of its own production. The independence of the grain was achieved. This of course, is directly realeted to the name of our head of state. Such reforms as radical transformation of the existing farming system to the achievements became the main factor. In particular, the transition from the old system of farming, which does not meet the requirements of the market economy, to the cultivation of crops that are processed between grain and row, that is, to the most intensive, short-turn-exchange sowing system, such as the cultivation of grass-fields and row crops, has marked a number of priority directions in agriculture. At the same time, it also serves to further improve the well-being of the population.

The Land Code, the laws “On farming”, “On peasant farming” and other normative acts adopted in 1998, have established norms aimed at the protection of the rights of landowners, the responsibility for the purposeful and rational use of long-term leased land, as well as maintaining and increasing the natural fertility of soils.

In the following years, in order to further increase the agricultural efficiency, work was carried out to optimize the crop areas of farmer farms. Because the land, the soil that is its fertile layer, is an invaluable asset of our country, and in the future it will also become the main source of agricultural production.

As a result of the reforms carried out in the field of agriculture, a new system of farming came into being. In this classic 3:7, 3:8 (alfalfa: cotton) and other crop systems, as well as 3-year-old alfalfa, corn, fodder crops placed in them have been destroyed. After the independence of our republic, the cotton solitude was liquidated.

Exchange and by turn planting procedures were introduced such crops as grain-cotton, grain-fodder, grain-cotton-vegetables. As a result, 32-35% of the total area to be irrigated for farming in the Republican practice of Agriculture was planted in the fall, 43-45% of cotton, and the rest began to be planted in vegetable and other food crops.

This is manifested in the fact that, in most cases, although it meets the requirements of the market economy, the positive role of the crops in the cotton complex in maintaining and increasing soil fertility is not enough. This can be explained by the law of return on soil, that is, with a lot of organic matter being removed, the rate of return to the soil is very low. For example, now without taking into account repeated crops, the main crops-cotton, 8-10 tons on a cotton account in the one-time exchange cultivation of grain crops, 11-12 tons on a grain account, in total from 1 hectare in one season to 19-22 tons of organics are leaving. The total volume of mineral and organic fertilizers in the soil does not exceed 1-2 tons. This condition causes a sharp decrease in soil fertility in the future.

According to the data from the experiment, which was founded in 1926 year at the Research Institute of cotton selection, seeding and cultivation agrotechnologies (former Research Institute of cotton growing), only mineral fertilizers with chronic planting of the cotton were observed at the highest level (34,1 %) disease with cotton villi in the support of N250 P175 K125 kg/ha. This indicator was 3,0 t/ha in chronic sowing, 9,9% in the option given to manure, 13-15% in the option given to alternating sowing and mineral fertilizers. So, these data are the most scientifically correct answers to the question of why the disease of the villi in the fields of care of the lary of the Republic is exacerbated at the present time.

According to the data, the yield was 9.8 t/ha when corn was grown chronically without fertilizer application, fertilizer support was given to 3,28 t/ha, 30 t/ha manure+ P_2O_5 25 kg/ha when grown chronically and amounted to 3,24 t/ha when planted chronically. The highest yield (4,02 t/ha) (3:7 alfalfa: cotton) was obtained when alternating planting+mineral fertilizers were applied to N150 P105 K75 kg/ha.

Currently, the total area of 44797.7 thousand hectares of our republic is 27521.6 thousand hectares. They are located in agricultural regions with different natural soils and climates, intensive farming is mainly carried out on 4278.0 thousand hectares of irrigated lands, where the melioration, ecological status and fertile level of soils are sharply separated from each other. Unfortunately even now, the land reclamation situation is unsatisfactory, deflationary, irrigation and the presence of areas where there is Jar erosion is a tendency to decrease soil fertility in the areas where farming is being conducted, the scientific and practical aspect of which requires a deep and consistent study of the issue.

As the main reasons for this, the deterioration of the melioration condition of the soil, the main factors that increase soil fertility, in particular, the wide, incomplete introduction into practice of exchanging planting systems, deflation-erosion processes, complete non-compliance with the soil main processing system, increased soil density in the subsoil layers of haddock and haddock, contamination by various chemical means. It is possible to cite other aspects of the complete non-functioning of the law of nature, such as plant nutrition procedures and the return of nutrients coming out of the soil with biomass to the soil.

Therefore, due to the demand of the present period, the exchange of agricultural crops in the storage and increase of soil fertility, planting, regular observance of it is an extremely important task. To do this, the following issues should be addressed:

1. Regular monitoring of the general condition of lands and their effective use;
2. Maintaining the balance of nutrients being removed from the soil and introduced into the soil, introducing more organic;
3. Ferm to further increase the scientific and practical potential of land users in general;
4. Wide introduction of resource-saving technologies, increasing soil fertility.

In order to restore and increase the fertility of the lost soil, it is necessary to focus the main attention from the farmer's farms on the siderat, repeated and intermediate crops planted in the winter wheat, to give priority to the cultivation of vegetables, melons, cereals and grain-leguminous crops, which can be nutritious fodder for the corresponds.

CHAPTER I.
THE IMPORTANCE OF AGRICULTURAL CROP ROTATION IN THE COTTON IN IMPROVING SOIL FERTILITY, CROP YIELD AND QUALITY

Regular high yields from farming crops and increasing labor productivity are linked to soil fertility and peasant culture. When it comes to soil fertility, it is understood that the plant is a natural texture, which during the entire vegetation period has the ability to maximize its demand for nutrients and soil moisture. The more fertile the soil is, the more saturated the plant has such nutrient elements and moisture, the higher the ability to give products.

Soil fertility varies depending on the peasant culture. The higher the peasant culture, the more fertile the soil becomes, the higher the yield from the crops is obtained. Being indifferent to the soil, the use of non-modern methods of farming leads to increased fertility of the soil, the quantity and quality of the crop decreases. On the issue of soil fertility, mankind has been struggling since very ancient times. At various stages of the development of society, various methods and systems of farming for the restoration and increase of soil fertility have been used.

In times when private ownership of land and other means was not formed, man began to use the appropriation of reserve new lands in order to ensure his daily food needs. Over the years, as a result of the cultivation of the same crops on these lands, soil fertility has decreased, polluted to a different extent and almost ceased to yield. In such cases, they abandoned the old lands and mastered a new one, etc. Such foiling from the lands was caused by their nomadic existence.

After the formation of private ownership and the transition of society to the system of slavery, private landowners, at the same time as the appropriation of new lands, were also engaged in farming on previously abandoned lands. For a long time on lands that did not yield at one time, the growth of plants of different degrees, their biological activity, as a result of the accumulation of the remaining organic remains from them, soil fertility was restored and they had the ability to give products. And this situation was formed in the minds of mankind at that time as a rule of the first peasantry. People have realized that in the case of farming, giving land rest from time to time will again restore the fertility of the soil, its ability to give products. Later, this "experiment “was introduced into agricultural science as”steam" (clean steam, black steam, etc.), which caused the penetration of such terms as" clean"," clean plow "(in subsequent texts the so-called" clean "is read as" clean plow").

The increase in population, the increase in demand for food products, the reduction of available land, the inability to always have a high harvest when planting the same crop for a long time there is a new system of agricultural conduct, the improvement of soil, the softening of the lands and the long years of their disposal, the landowners who realized that which led to the cultivation of farm crops.On the basis of which the idea of the initial exchange of agricultural crops appeared and this later became an integral part of the farming operation.

In this way, initially two-branched crop rotation-clean plow, autumn grain or spring grain or corn, and later three-branched-clean plow, autumn rye, spring oats, four-branched-clean plow, cotton, clean plow, corn crop rotation systems appeared. These systems were widely used mainly in the countries of Western Europe and Russia in the late XVIII and early XIX centuries.

The introduction of the “clean plow” field into the system of crop rotation has led to a sharp decrease in the physical and water physical properties of the soil, as a result of a short decrease in the reserves of humus in the soil, although in many cases positive conditions have been created in the fight against weeds, the accumulation of additional reserves.

In general, the exchanging system, which included the field” clean plow", could not even fully justify itself everywhere over time.

Specific climatic conditions in the regions of Central Asia, particular in Uzbekistan (low rainfall, extreme dry and hot summer season, etc.) as a result of the sowing of buds and other crops on a regular field caused a decrease in the fertility of the soil. As a result, the peasants abandoned the lands they were farming and began to master new lands. But, due to the lack and shortage of water resources, they could not fully use these lands either. They were again forced to return to their former lands, where they were engaged in farming, soil fertility decreased, the ability to give products at all.

In order to get out of this negative situation, to restore, increase soil fertility, the peasants introduced into the land the remains of old walls, sludge that came out in the process of purification of the beehives, what can be used to restore soil fertility in general, those things that were introduced into the ground.

In the literature, it is mentioned that in the densely populated regions of Central Asia, for example, in the Fergana valley, there is a system of sowing, in which crops are exchanged in a certain order, in some cases they use local fertilizers (manure). Especially on this place. It is permissible to pass F.Middendorf's thoughts. In his work, which he published in 1882 year, he writes:"the abundance of the species of cultural crops in Eastern farming and the existence of their alternately cultivated form force the peasants to consider switching to a completely new system."

It is known that in the Fergana valley at that time, peasants were forced to grow quail for many years (8-10 years) in one field in order to feed their livestock to lands that were close to the places where they lived. In the first year after the clover corn was planted, in the second year melon, in the third year pumpkin, in the fourth year maize was grown, then again alfalfa was planted. In other fields, the first year was winter wheat, the second year corn or millet, and in the next two years corn was taken care of. The peasants did not forget to put a local fertilizer in the cotton-growing field, of course, in the autumn and before planting.On this S.V.Ponyatovsky writes: "Fergana Uzbek peasants, through the systematic use of local fertilizers in the cultivation of crops, established a free system of farming and created a unique method of peasant culture."

Well-known agronomist and scientist M.Bushuev was in the Fergana Valley on July 10 – on August 5 1910 year and described what he saw there in his work "on the Pakhtakor districts of Turkistan". Andijan any man Yunusali Yusubaev grew cotton on 2,5 hectares of land for 10 years and received high yields. This he once every two years putting 12-14 tons of local manure per hectare, while maintaining a smooth fertility of the soil. In two places of Pakhtakor Mulla Madrali, one was 10 hectares, the other was 12 hectares of land, the first was cotton in 8 hectares, clover in 2 hectares, rice in 3 hectares of the second field, alfalfa in 2 hectares and cotton in 7 hectares. From cotton, 1,4-1,5 t/ha were harvested. Cotton is grown on the fields once every two years from 10-12 tons of local manure, while other crops produce more than 120 tons of arugula per hectare of arugula on each hectare of cultivated fields.

Later it became known that in 100-120 tons of stubble sludge 80 kg, when the content of stubble was 0,15 percent nitrogen, 0,4 percent phosphorus, 1 percent potassium, from 140 kg.nitrogen up to 220 kg. from 350 kg. phosphorus and up to 550 kg. from 750 kg. until the presence of potassium is determined.

In 1898 year S.V.Ponyatovsky conducted an experiment in the field of Ashgabat, consisting of a five-branching sowing system. In this planted corn on the first field, millet on the second field, autumn on the third field, corn on the fourth field, corn on the fifth field, and this experience gave its positive results.

In addition, in the field of Mirzachul experiment in 1904, scientific research was carried out on crop rotation, the field of crop rotation consisted mainly of six fields - the first year of winter wheat (beans as a grain fertilizer after harvesting), the second year of cotton, the third year of corn (beans between the corn rows), the fourth year of cotton, the fifth year In addition to this exchange system, 4 fields (clean plow, autumn plow, sugar beet, spring plow) and 8 fields (cotton, autumn plow, alfalfa, cotton, corn, sugar beet, corn, clean plow) have been studied.

In the experience of Turkistan, a 12-branch exchange planting system was studied to study the issue of maintaining and increasing soil fertility.

In Central Asia, agricultural crops are selected and planted mainly due to market conditions in crop systems. At that time, among agricultural crops, the economic income from cotton was high, and in many cases there was a sequential cultivation of the cotton in the switching sowing system.

S.V.Ponyatovsky argues that when analyzing these different types of crop rotation systems, in spite of the fact that the crop rotation systems are structured in any case, the crop rotation in the crop rotation system for 3-4 years in a row sendstirib a sharp decline in soil fertility and cotton yield, therefore, local and mineral fertilizers should be used from the 3rd year.

V.I.Masalsky observed the work in Turkistan agriculture in 1913 year, he writes about the fact that in the regions near the city, where water and fertilizers are well supplied, the exchange of crops is intensively carried out, and the planting of in-demand crops into one field for several years has become a habit. Water shortages, fertilizers are not enough, and in remote areas from the city, the exchange of crops is based on a clean plow system, in the summer the plowed field was originally planted in the winter wheat, next year corn or sorghum, then barley (beans as a repeated crop after barley), and in the spring next year millet or spring. If clover is included in the alternation planting system, then sesame, melon, watermelon after quail, in some cases corn is planted. After the row of inter-processed crops, mainly grain crops with a spike were grown.

In the 1916 the S.G.Kondrashev is in an oasis of Khiva, and he recalls the peasant culture there: “a lot of work is being done here to increase the fertility of the soil, and in peasant farms the crops are mostly planted in the following order: the first year after the alfalfa is corn, the second and third years are cotton, the fourth and fifth years are winter wheat this is the most cost-effective way to get foiled from the land.”

In the economic agriculture crops Khujayl district of the Republic of Karakalpakstan 39,8% of cotton, 20,3% of fall, 10,7% of alfalfa, 8,1% of corn, 4,8% of melon and other crops accounted for 6,3%.

In 1914, the total irrigation area in Uzbekistan was 1663.9 thousand hectares, the distribution of crops was as follows: grain and grain-bearing crops 906.7 thousand hectares (54.3 %), cotton-plant 473.8 thousand hectares (28.5 %), clover 182.2 thousand hectares (10.9 %), vegetables and farms 74.7 thousand hectares (4,5 %), other technical crops 26.5 thousand hectares (1.8 %).

One of the largest scientists of the cotton industry is according to M.V.Mukhamedzhanov's observations in 1923-1930, in the Baghdad district of Fergana region, the exchange of agricultural crops was widely established, several types of crops were planted in each farm. The peasants very well mastered the cultivation, especially when exchanging crops, and after the alfalfa was sown, instead of corn or melons, they planted corn or melons in the second and third years and in the fourth year-barley or barley as the second crop after harvesting the willow or barley, they cultivated such crops as beans, bean, corn, sesame, millet, or left empty until spring without planting anything on this field and planted seedlings in the spring.

In other regions of Uzbekistan, due to water scarcity in most districts of Bukhara and Kashkadarya, they were forced to leave part of the land (without sowing any crops) for the impossibility of full use of the existing land in peasant farming. Such a system was observed even in the densely populated Fergana valley regions until the 1930 years, that is until the structure of the collective farm system. Due to the abundance of land in the Republic of Karakalpakstan, the Northern territory of the Republic, this system was used a lot.

In general, A.F.Middendorf, M.Bushoev, S.V.Ponyatovsky, V.I.Masalsky, S.K.Kondrashev and M.V.Muhammedjanov the data and analysis provided by indicate that several practical works on the exchange cultivation of agricultural crops in Central Asia were carried out at the end of the XIX and beginning of the XX centuries.

In addition to practical work, the theoretical determination of soil fertility and crop yields in the cultivation of agricultural crops in one field for a long time and several similar legislations attracted the attention of scientists of different countries. They carried out research work in order to find out the causes of this condition.

From such research, it is believed that the Russian scientist, agronomist A. Bolotov in the second half of the XVIII century,in the end he developed the effective foundations of farming. He described his theoretical ideas in his work "on fields taqsimlash", which he published in 1771 year. This work later became the main guide not only on the creation and use of land, but also on the multi-field crop rotation.

The modern man of A.T.Bolotov, the work of I.M.Komov, which he published in 1788 year, was recognized as an excellent second source on general farming. I.M.Komov drew the main attention in this game to increasing soil fertility and farming culture. He scientifically substantiated that soil fertility can be enhanced by extensive application of local fertilizer, proper organization of crop rotation and perfection of soil tillage. He drew attention to cattle manure from local fertilizers and proved that the use of manure positively affects the agrophysical properties of the soil and helps to keep moisture in the soil.

I.M.Komov unlike many scientists, put forward the idea of planting a multi-field swap and supported it. In his opinion, the desire to leave the lands on which fertility has decreased and assimilate other lands will lead to the destruction of soil fertility in farming, in general soil. The fact is that it is necessary not only to leave the lands, but also to additionally feed, to use as much local fertilizers as possible, to increase the variety of crops.

Therefore, the scientist proposed 6-branching systems in extensive cases, and 2-branching systems in intensive cases. In particular, he advocated the broad use of the grass-field exchange planting system, emphasizing the interdependence of farming and the livestock sector. He also put forward the idea of deep plowing of lands as soon as agricultural crops were harvested.

Between 25 years later, more precisely in 1831 year A.Teer proved the nutrition of plants with humus, based on the theory of the formation of humus in the soil in the science and its assimilation by plants. At the end of the XVII and beginning of the XVIII century, in all European countries, particular in Russia, there was a wide introduction of the system of planting grass-bearing clever-winter wheat, turneps, barley+clever, based on humus-bearing crops on the soil. In the introduction of this exchanging planting system, it was originally planted the clever plant as a feed for livestock, later it was given importance in place of increasing soil fertility and crop yields, and the exchanging planting system was given a wide place to include more leguminous clever, esparset, alfalfa crops.

But the German scientist Libix in 1840 year criticized the theory of mastering humus in the soil by plants and did not support this theory. He came up with the theory that plants basically need mineral nutrients in the soil, that no plant can enrich the soil with nutrients, therefore, the more nutrients the plant brings from the soil, the more minerals it needs to fertilize and replenish its place. This of course, was the conclusion made based on the results of a chemical analysis conducted for many years on the amount of nutrients (vinos) absorbed by plants from the soil.

Later, on the basis of this idea, a factory was built and launched, which produces artificial mineral fertilizers in Germany. The factory is built in such a way that it is adapted to the production of mineral fertilizers, suitable for each plant. The norms of application of mineral fertilizers are established depending on the amount of yield from crops. Over the years, this theory did not justify itself in economic production. Because such a method caused an increase in the number of a certain element in the soil, and the decrease in the number of elements that other people needed, especially at that time for the plant. Soil fertility and crop yields have declined.

Thus, the theory of the artificial return of nutrients to the soil, assimilated by plants, put forward by Libix, did not justify itself. But, nevertheless, this idea, put forward by Libix, later made a significant contribution to the development of science of agronomy and agrochemistry.

If Libix came up with such ideas that “almost all types of plants absorb nutrients that belong to them in different quantities from the soil, but no plant will help to improve the fertility of the soil”, then his contemporaries, the French scientist J.Bussengo comes to the following conclusion after numerous studies: “not all types of crops being sown in farming also take away nutrients from the soil. There are such types of crops, for example, clever, esparset, alfalfa vs enrich the soil” in one of such experiments he found that the amount of nitrogen that plants extract from the soil is higher than the amount of nitrogen that is given to them during their breeding. In the sentence of such experiments, the following experience can be cited. Bunda before planting clover contains 224 kg. 44 tons of nitrogen were given. During 5 years of care for the quail, he gave 44 tons of hay harvest hectare. According to his analysis, in 44 tons of hay 1035 the presence of nitrogen was determined. So, during 5 years of care for the quail, it weighs 1035 kg of soil, he mastered nitrogen. Before planting a quail is given 44 tons which contains 224 kg. of cotton, if nitrogen is subtracted from the amount of nitrogen absorbed by the alfalfa, then 811 kg. nitrogen remains. The state of thought-out J.Bussengo plant plus 811 kg. There was where and how nitrogen was assimilated. Of course, he did not know that leguminous plants fixate nitrogen in the atmosphere through nodular bacteria. This process remained abstract to him until the last years of his life. Only 50 years later, in 1887 year, another German agrochemical scientist Gelrigel fully proved this process from the scientific side.

With the implementation of numerous scientific studies, the problems, questions that await their solution in the science of farming have increased. These problems and questions were then answered with their practical research and theoretical knowledge V.V.Dokuchaev, P.A.Kostichev, V.R.Vilyas and other scientists made great contributions to the science of farming and soil science.

V.V.Dokuchaev and P.A.Kostichevs gave a comprehensive description to almost all existing soils, in-depth study of such processes as the causes that lead to drought and a decrease in soil fertility, factors of soil structure degradation, progressive methods of increasing soil fertility, and identified directions for important agrotechnical measures of obtaining a balanced high yield from agricultural crops. Activities such as the proper organization of the regions, the scientific justification of crop rotation, the proper processing of soil, the direction of rivers flow and their activities effectively for agriculture, the construction of reservoirs, the prevention of wind and water erosion and the organization of forest ecosystems with the aim of improving microclimate and maintaining moisture in the soil are among .

But these practical and theoretical ideas are supported by the dictates of that period.Later V.V.Dokuchaev and the ideas raised by the A.V.Kostichevs.The R.Williams has developed and implemented.

V.R.Williams developed a system of grass-field crop rotation farming in increasing soil fertility and began to introduce it into the whole system of farming, regardless of soil and climatic conditions. V.R.Williams argued that the main factors in plant life-light, heat, water and nutrients-are equally important for plant growth and development, and the law on its management. But only two of the main factors listed above, the fact that a person can control water and food at his own discretion, the remaining two factors, the inability of a person to control light and heat for the time being, have remained unnoticed.

V.R.Williams argues that the main influence on soil fertility is the structure of the soil. In his opinion, although the root part of a one-year-old plant develops mainly in different layers of soil, the root does not develop in a wide comb in the soil tillage. On the surface part of the soil, the organically forming mass is less, so it does not form a sufficient amount of humus, which, as a result, negatively affects the structure of the soil. Therefore, he recommends planting these crops in a mixture with perennial legumes and virgo, who have a strong popcorn root system. When doing this, the roots in the surface part of the soil break through all parts of the soil, after they dry up and rot, a humus is formed in the soil. From the formed humus, the soil particles are fed and receive a compound, resulting in an increase in the number of granular particles in the soil. In addition, the energetic roots of perennial leguminous plants penetrate into the deep layers of the soil, helping to get out of there kaltsium and other elements into the upper part of the soil. As a result, kaltsium reacts with other elements of the upper part of the soil, further strengthening the soil particles. It is believed that this will greatly help to keep the soil from the effects of water erosion in the future. Proceeding from this V.R.Williams comes to the final conclusion that the planting of crops individually when exchanging does not yield what does when increasing soil fertility and improving its structure.

V.R.Williams notes that the main structure of the grass-field farming system consists in the introduction of alternating planting, consisting of a mixture of legumes and spike crops, processing of the soil before main and planting, strict adherence to agrotechnics of agricultural cultivation, systematic, correct organization of feeding, wide introduction of forest ecosystems that maintain soil moisture and its fertile part, the use.

In the Pakhtakor districts, there should be a mixture of the past of the cotton, of course, the alfalfa with the clover with the spike. In the system of clover crop rotation 3 years, if the soils are less fertile, prone to salinization 4 years to be cared for, the soil can be planted somewhere 5-6 years, in the same place of the husks after alfalfa in areas where fertility is moderate and good by V.R.Williams.

However, changes in socio-economic life, results of many years of experience and conclusions made V.R.Williams propagation and introduction by Williams revealed a lot of shortcomings of the grass field farming system.

The increase in the population as well as the sharp increase in the demand for food could not be answered only by the agricultural system based on the perennial planting of grass. Because, this system of farming would not allow the increase in the amount of cultivation of legumes, cereals, technical, corn, spike and other agricultural products. In addition, V.RWilliams was completely against the application of the syphilis system to reduce soil salinity, the use of boron and mole in soil processing, the planting of the main agricultural crops individually.

Even so, these ideas and laws, promoted and introduced by V.R.Williams, have contributed to the development of peasant science and farming. Deep, planned work on increasing soil fertility in Central Asia began mainly after 1930 years, more precisely after the establishment of the All-Union Cotton Research Institute (later the scientific-research institute of cotton growing of Uzbekistan, now the Research Institute of cotton selection, seed growing and Agrotechnology of cultivation).

Significant work in this direction was carried out in 1939-1958 year I.A.Under the leadership of Dorman, the Department of "crop rotation" of the institute was carried out. I.A.Dorman and he led scientists from Central Asia and South Kazahkstan, irrigation and melioration, soil tillage, feeding systems in the climatic conditions of irrigated, cotton-grown soil intertwined grass-field-exchange planting buds, alfalfa system is effective, in this system it is possible to maintain, increase soil fertility regularly, ultimately to obtain a higher yield from agricultural crops.

According to the results of the research conducted in the Akkavak experiment, the cultivation of the cotton after 3 years of alfalfa without fertilization was 10 t/ha higher than the yield of the option in which the guinea pig is grown. Similarly, when the cotton was fertilized after 3 years of care, the yield again increased by 5-6 t/ha. It was also observed that the cotton crop decreased after 5-6 years of care after the baby. After these results, I.A.Dorman comes to the following conclusions: "in order to ensure that soil fertility and cotton yields are high regularly, it is necessary to introduce perennial herbaceous plants in long periods of time, not longer, into the alternation planting systems."

Based on the results of the multivariate research, I.A.Dorman recommends the following alternating planting systems for cotton fields: 3:7 (three field alfalfa, seven field cotton), 1:2:7 (one field corn, two field alfalfa, seven field cotton), for soils with medium and high soil fertility, 3:6 (three field alfalfa, six field cotton), 1:2:7 (one field corn, two field alfalfa, seven field corn), 2: 4 (two field alfalfa, four field cotton) and 1:2:6 (one field corn, two field alfalfa, six field cotton), in saline soils 3:5 (three field alfalfa, five field cotton) and 1:2:5 (one field corn, two field alfalfa, five field cotton), in strongly saline soils 3:4 (three field alfalfa, four field cotton), 3:5 (three field alfalfa, five field cotton) and 1:2:4 (one field corn, two field alfalfa, four field cotton). In issuing these recommendations, it is based on the conclusion and the grounds that it is possible to give a wide place to the cotton in the structure of the planting system, with a high level of soil fertility of some tamoiyilians, including those cotton soil fertility is low, the agrophysical status is poor, the yield of perennial grasses to culturally undeveloped lands.

Another major scholars of the same field is professor Z.S.Tursunkhodzhaev after a long research in Mirzachul proved that under these conditions 2:4 (2 field alfalfa, four field cotton), 2:5 (2 field alfalfa, five field cotton) exchange planting systems are effective. S.N.Rijov in his work wrote in 1958, that the exchange of agricultural crops is a key element of the agricultural system, as well as the conditions of the soils of Central Asia and the optimal system of crop rotation for obtaining higher alfalfa from cotton is the system of crop rotation.

On the basis of such teachings, the introduction of crop rotation in farming, the preservation and increase of soil fertility became the main cornerstone of the science of farming. Due to the numerous studies conducted, agrotechnical measures of increasing soil fertility by exchanging agricultural crops, rational use of land, quality and high yield have improved over the years.

It is known that for many years extensive coverage studies have been conducted on the study of the system of crop rotation in agriculture especially alfalfa. The from 1930 y. to 1990 y. of the twentieth century, one of the main leguminous plants in increasing soil fertility and crop yields was considered alfalfa for 55-60 years. In this regard, a huge number of scientific research works have been carried out in various soil climatic conditions.

On the study of the importance of alfalfa in increasing soil fertility in Central Asia, initially in 1930 years R.Y.Ioffe, later F.Y.Geltser (1934), A.I.Golodkovsky (1937),in the post-war years.M. Bodrov (1951), I.I.Madraimov(1955), N.M.Savelev(1960), L.A Spijevskaya (1963), M.A. Saragin (1969), A.S. Balkunov (1970), V.G.Berezovsky (1976), scientific research was conducted on the effect of alfalfa on soil, the amount of organic residues, its chemical composition.

According to R.Y.Ioffe (1930), after a two-year alfalfa, in the layer of soil expulsion from the burrow, the root and angular residue were collected up to 3,19 t/ha, after a three-year alfalfa, to 6,14 t/ha, after a four-year alfalfa, on the account of 5,98 t/ha.

In conditions of irrigated typical gray soils A.I.Golodkovsky and N.I.Golodkovskaya (1937), the soil is 0-30 sm. in the layer collected root mass in the amount of 3,75 t/ha of one-year cotton, 4,17 t/ha two-year cotton, 6,63 t/ha three-year cotton.

Similar result was obtained in the studies of A.L.Toropkina (1952) and 0-40 sm. of typical gray soils. In the first year of cotton in the layer, the root mass was 6,65 t/ha, in the second year 11,3 t/ha, and in the third year 10,51 tons. Data with such legislation M.V.Bolotnikov (1933), P.M.Bodrov, V.G.Berezovsky (1951), I.I.Madraimov (1955), A.K.Kashkarov (1959), E.I.Aliev (1964), V.R.Biteeva (1986), A.T.Azizov (1989), T.F.Rakhimboev (1990) also found his proof in their studies.

It is known that the high annual temperature in irrigated lands, the application of accelerated methods of soil tillage in the cultivation of agricultural crops, as well as the accumulation of natural humus in the soil as a result of irrigation of crops, decreases rapidly. As a result, the soil itself loses its biological properties, in which the pathogens of bacteriological diseases increase, the yield of crops decreases. Therefore, it was demonstrated that the use of only one alfalfa plant in the effective exchange of agricultural crops for the preservation and increase of soil fertility, obtaining a high yield from crops, did not give a positive result. Because of the long years (7, 8 years) after the alfalfa of the cotton in the crop systems of crop rotation, regular decline in soil fertility and crop yields began to be observed. Therefore, the need to introduce intermediate, repeated grain, grain-bearing and grain-bearing crops into the systems of crop rotation arose. In this regard, along with perennial leguminous plants, a number of scientific research studies have been carried out on intermediate, grain, grain-bearing and grain-bearing crops, the impact of which on soil fertility.

First of all, the idea of using intermediate crops for the year-round use of irrigated lands in different soil and climatic conditions of Central Asia in the exchange of crops was introduced in 1942 V.S.Malchigin argued. After that, the number of these studies increased and T.Nagiev (1961), E.Yadgorov, R.Aripov (1967), M.A.Sarakin (1969), E.P.Gorelov (1968), A.K.Arciev (1968), V.G.Berezovsky, M.A.Sarakin (1969), V.G.Berezovsky, N.Safiev (1971), Ya.D.Nagibin, U.Rakhmatullaev (1972), X.S.Romanov (1973), V.S.Khankishev (1979), R.A.Aripov (1980), Z.S.Tursunkhaev, A.S.Balkunov (1981), Z.S.Tursunkhaev, A.Bekmurzaev (1981), Q.M.Mirzajanov, K.M.Yusupjanov (1981), E.P.Gorelov, I.Rasulov (1983), M.Tadjiev(1985) V.Massino (1986), A.Kashkarov, N.Makhmudov (1988), K.Kamilov, X.Yusupav (1991), R.A.Oripov N.T.Xalmanov (1996), A.M.Nuriddinov (1996), M.Tojiev, A.T.Kadirov (1996), B.Isaev (2000). It was studied by B.M.Khalikov (2007) and others.

According to these authors, the more intermediate and one-year grain, root and stubble residues of grain-bearing plants remain in the soil, the more effective the effect on soil fertility is achieved, as a result of which a high harvest of cotton is obtained.

According to F.V.Turchin (1964), leguminous grain plants, which are alternately cultivated throughout the year, provide useful microflurane in the soil. Depending on the fermentation properties of microorganisms, nutrients, which are difficult for plants to absorb, are also used.

According to R.A.Oripov (1980), the main phenomenon in increasing soil fertility is the microbiological processes occurring in the soil throughout the year. Therefore, in order for the microbiological processes occurring in the raw soil to last all year round, it is necessary to use biodiversity, increasing their species, number in the systems of crop rotation.

The idea of the same content S.A.Vorobev (1979) also affirmed and said that there should be a lot of type of crops in exchange planting, although organic residues left by them in the soil remain in very small quantities, basically they provide the plant with the necessary nutrients. The important thing in this process is that microbiological decomposition in them occurs quickly, in most cases, even superior to organic fertilizers for the formation of humus. Only for this it is necessary to collect enough biomass in the soil.

Numerous studies have shown that an increase in the variety of crops in crop sharing systems, including maize, Sudanese grass, sorgo, amarant and others, will have the opportunity to collect more biomass in the soil.

According to F.Luksenko (1957), when corn was sown in the spring, it received 600-631 quintals per hectare, when sown in the summer, it received 500-615 quintals, when sown in the spring, and in total in a year the yield of silage mass reached 110-120 t/ha.

In studies of L.A.Spijevskaya,M.Tojiev (1970), it was observed that grain-leguminous crops densify the soil in a small amount compared to bedbugs, their tiny roots decompose a certain amount of humus and organic matter in the soil during the period of plant growth, improving the water-physical, physical state of the soil.

Z.M.Zaurov, A.Madraimov (1974)found that after the rye was driven into the soil as a siderat, from year to year the bulk mass of the soil is reduced, the structure of the soil is improved.

H.I.Baykobilov (1975) also emphasizes that soil density decreases as a result of sowing intermediate crops and expelling them into the soil as a siderat in early spring, soil water permeability increases significantly compared to the land in which permanent crops are planted.

Scientific worker of the Plant Science Research Institute of Bonn, Germany according to V.Volker (1979), the systematic introduction of intermediate crop-sharing planting systems is important in maintaining and increasing soil fertility. After the intermediate crops are plowed into the soil as a siderat, 30-60 kg/ha of land is ground as a result of the crushing of plant residues in the arable layer of soil, nitrogen is collected and given positive conditions for feeding the main crop, which will be next planted. In addition, intermediate crops are an important nutrient base for animals (if they are not expelled into the soil) and improve the nutrient balance in the soil. It also prevents the process of washing the lower layers of the soil under the influence of autumn and winter precipitation-hair on the nutrient elements in the soil.

Similar opinions are given by the Austrian scientist K.Binder (1989) also affirmed that intermediate and repeated crops are considered one of the important factors for agricultural intensification. They are not only additional and inexpensive nutritious plants,he said,but they also improve the soil structure, increase fertility and lead to an increase in the number of cereals and cereal products in the alternation planting.

Another of the cereals that improve and increase the soil structure is bean. In many literature, bean is described as a grain-grain crop, which greatly improves the agrochemical properties of the soil. About its effect, scientific research has been conducted by many scientists.

In particular, Y.G.Koryagin (1978), G.T.Lavrinenko, K.Ashmirzaev (1978) M.M.Saltas (1981), K.M.Mirzajonov, M.Nasriddinov (1982), X.Nematov (1984), A.Panjiev (1986), X.S.Romanov, K.M.Mirzajonov, R.T.Talibulin (1990) and other scientists.

In the experiment of B.Koryagin (1978) in the conditions of Kazakhstan, it was observed that the finished bacteria in the roots of bean biological nitrogen up to 300 kg/ha on a hectare of land.

V.I.Zaveryukhin (1981), the bean root system is well developed which improves the physical properties of the soil and increases the nitrogen content in the soil by helping the nutrient elements in the deep layers go up.

H.S.Romanov (1986), bean are well-pasted to a plant cultivated after itself in many interchange planting systems, and each hectare enriches the soil with nitrogen up to 130-150 kg/ha, while root residues constitute 3,5-4,0 t/ha, causing an increase in the amount of humus in the soil.

Proceeding from the above points of view, it can be said that the use of intermediate, grain, grain-legume crops when exchanging or sequencing agricultural crops contributes to the maintenance and increase of soil fertility of irrigated lands, one of the main conditions for exchanging planting is the long-term continuous covering of the land with plants, the accumulation of a lot of organic such results, of course, can be achieved only when the agricultural crops included in the system of crop rotation are properly sorted, regardless of how the crops are planted (main crop, repeated crop, intermediate crop).

Above, general information was given on how intermediate, grain and grain-bearing crops are so important for soil properties. The data obtained from this research work contrary to the doctrine that I.RWilliams gave when planting alternately only the root part of the crops to choose well-developed plants, focusing on planting them without further intervention to improve the structure of the soil, the attitude of each plant to the soil at this or that level depends not only on their multi-or one-year division, but also on their biological one of such biological properties of plants is the release of organic residue (stubble and root) in the soil. After all, the appearance of organic residues in the soil causes the richness of the reserves of humus in the soil.

According to M.A.Khodanovich (1958), 4,94 t/ha quintals of corn in the expelled layer of black soil, as for the data of I.Sidorov (1980), it leaves 4,1 t/ha quintals of root residues.

V.G.Berezovsky, F.I.Ismailovs (1959), under the conditions of typical gray soils, alfalfa leaves root residues in the amount of 4,0 t/ha quintals, of which 28,0 quintals are large, 1,2 quintals are small root residues. When added with alfalfa looats, these indicators were 4,8, 3,5 and 1,3 t/ha quintals respectively.

F.I.Ismailov (1962) similar thoughts also stated that when planted with alfalfa corn, the soil in the first year 0-40 sm. in the layer, it was found that 8,8 t/ha quintals, 11,7 t/ha quintals in the second year, 13,2 t/ha quintals in the third year left.

In the conditions of typical gray soils according to research conducted by L.A.Spijevskaya (1963), corn soil is 0-40 sm. 6,2 t/ha quintals in the layer to cover the remains of the root and angus. In the conditions of the Karshi desert, these indicators constituted 9,9 and 11,8 t/ha quintals.

Also, research has been carried out by many scientists on the study of the remains of tubers and angiosperms that leave grain crops with a spike in the soil.

According to E.I.Aliev (1964), 0-20 sm of autumn soil 4,0 t/ha quintals in layer, according to N.Gutin (1964) 4,8 t/ha quintals, peas 2,2 t/ha quintals, according to information received by M.Tadjiev, H.Baykobilov (1972), as a result of the cultivation of maize twice a year, it was found that it left an organic mass from 5,5 t/ha quintals to 5,8 t/ha quintals.

And according to the data of H.Baykobilov (1975), the autumn rye leaves the remains of roots and angiosperms in the amount of 5,1 t/ha quintals.

According to B.Kenjaev (1977), in the soil, not only perennial plants, but also perennial plants leave abundant root and angular residues.

A.Khalikov (1985) stated that the harvesting of 2-3 piece in a year increases the productivity of irrigated lands by 2-2,5 times, thereby leaving a very large amount of root and stubble remains in the soil, which increases the fertility of the soil and the yield of subsequent sown crops.

V.S.Khankishev, T.N.Namozov according to the data received by the (1981), the soil is enriched with organic residues with the largest amount of corn (7,0-8,4 t/ha quintals), then grain-bearing crops (3,9-4,1 t/ha quintals). After two consecutive years of cultivation of autumn rye as an intermediate crop in Samarkand branch of the Scientific Research Institute of cotton growing of Uzbekistan, 23,5 t/ha quintals of organic residues were collected in each hectare, that is 120 tons of manure.

As already mentioned above, the emergence of a favorable environment in the soil for the plant is the type of crops planted, the system of their interchange planting, and to what extent the maintenance agrotechnics are carried out, will also seriously affect the agrochemical properties of the soil. One of the only issues in increasing soil fertility is the problem of producing humus on this soil. Humus is considered the most important element of the biosphere and serves to synthesize and multiply the amount of biomass in the soil. An increase in the amount of humus in the soil, of course, is due to the amount of organic residues that remain in the soil.

About the importance of intermediate, repeated, nutrient crops in increasing soil fertility, many scientists have found that in different years (P.M.Bodrov 1951, T.S.Malsev 1954, L.A.Spijevskaya 1963, M.A.Sarakin 1963, N.S.Safiev 1964, N.P.Disheveled 1970, N.B.Kashkarov 1977, V.S.Khankishev 1979, R.A.Aripov 1980, E.B.Vinogradova 1995, A.A.Kashkarov 1997) carried out scientific research.

According to T.S.Malsev (1954), nearly all types of agricultural crops, whether they are per annum or per annum, leave a large amount of organic residue from the nutrient elements that they absorb from the soil during their period of validity.

According to the multi-year experience conducted on the earths and legumes at the Rotamsted Experimental Station, the amount of humus and nitrogen in the soil does not decrease in the options in which these crops are grown on account of the organic remains remaining from them during and at the end of the validity period of these plants (1964).

According to L.A.Spijevskaya (1963), in the conditions of typical gray soils of the Tashkent region, the cultivation of one-year feed crops increases the amount of humus and nitrogen in the soil. The amount of humus was 0,78% after grinding the quail, 0,72% after corn, 0,67% after the cotton, and 0,107% after the total amount of nitrogen, 0,098% after training, 0,094%.

P.K.Ivanov, A.B.Khudyak (1964) found out, grain-bearing crops leave nitrogen at 40-60 kg/ha in the soil through the remains of angiosperms and roots, phosphorus at 35 kg/ha, and maize at 65-80 kg/ha, phosphorus at 20-25 kg/ha.

According to R.A.Oripov (1968), intermediate crops increase the solubility ability of phosphates in soil. When raps, barley and other intermediate crops are sown, the amount of phosphorus in the soil layer is 11,8-16,6 mg/kg. has established.

V.G.Berezovsky, M.A.Sorokin (1969), as well as a number of scientists H.S.Romanov (1973), H.I.Boykabilov (1975), A.S.Balkunov (1986), A.M.Kuchkarov (1993), as noted by M.T.Tojiev (1991), one-year feed crops used in the cultivation of crop rotation are important in increasing soil fertility as well as crop yields.

P.N.Y.Besedin, T.T. Bulatov (1970) pointed out, in conditions of typical gray soils, for many years, the cultivation of hemp causes a sharp decrease in the amount of organic uglerod and nitrogen in the soil.

According to V.G.Berezovsky, I.Safiev (1971), as a result of the application of one-year feed plants in crop rotation, soil fertility increases and allows to obtain an additional cotton crop in the amount of 0,4-0,5 t/ha compared to the option of growing cotton with absolute fertilizer.

According to R.A.Oripov (1972), intermediate crops in the amount of 4.17 t/ha were expelled from the soil as a result of the expulsion of the blue mass to the soil 0-12 sm. the amount of humus in the layer to 0,05%, 12-25 sm. in the layer, it increased by 0,07%.

According to Z.S.Tursunkhujayev (1972), cultivation of leguminous grass plants in conditions of hungry grassy soils causes early maturation of cotton and high yield.

According to F.Yusupov (1980), after the feed crops are plowed into the soil, the process of nitrification in the soil increases, and the amount of nitrate nitrogen in the soil during the same grain harvest period is 15,6-26,4 mg/kg.

According to I.F.Temirgaliev (1985), as a result of the addition of Sudanese grass with bean, vigna, as well as peas and raygras, and expelling them into the soil, 56,4 to 116 kg. nitrogen, up to 26,6 from 36,3 kg. leaves a phosphor element up.

According to the data obtained by A.Jdanov (1987), the amount of humus in the soil as a result of the cultivation of the alfalfa increased from 1,67% to 1,73%, when planted with alfalfa addition from 1,67% to 1,79%. The amount of humus in the option planted in the quail itself was 1,90% before planting the cotton, 1,83% at the end of the period of application of the cotton, the amount of humus in the planted option with alfalfa was 1,93% before planting the cotton, 1,89% at the end of the period of application of the cotton.

M.Tojiev (1980) found that the cultivation of plants in different agrophones have different effects on the amount of humus in the soil. It was observed that the initial amount of humus as a result of fertilization of the humus, fertilizer decreased from 1,34% in 1964 in the drive layer (0-30 sm.), 1,30% in 1971, 1,06% in 1974, 0,93% in 1989, while the amount of humus decreased from 1,40% to 1,10% as a result of planting with fertilizer.

According to the A.M.Kochkarov (1993), the expulsion of root and root residues from one-year plants into the soil ensures an increase in the amount of humus from 0,2% to 0,8%.

According to A.S.Kochkarov (1996), in soybeans grown under the conditions of typical gray soils, biological nitrogen was overgrown from 171,6 kg/ha to 228,5 kg/ha.

In the research of A.Kashkarov, T.Pirokhunov (1996), rye, which was expelled in the spring as a blue fertilizer, contributes to an increase in the amount of humus in the soil. If the initial amount of humus in the soil was 1,05% in the hay layer, then at the end of the experiment it was observed that this indicator increased by 1,19%.

According to the data of U.A.Alimov (1974), both corn and white corn are found to be good trace crops for corn. According to the data, after these crops, the remains of roots and angiosperms remained in the soil to 7,1-7,4 t /ha.

This means that in farming, especially in increasing soil fertility, the selection of the type of crops that leave as much organic residues as possible on the ground in the creation of exchanging planting systems, their sequential placement in the established order, the proper organization of work will create great opportunities.

It is known that when maintaining and increasing soil fertility, the transition of microbiological processes in the soil at an accelerated pace, the formation of humus in the soil, the intensity of the process of formation, the amount of humus, of course, depends on the number of useful microorganisms in the soil. The number of useful microorganisms in the soil depends on the type of soil and its agrophysical concentration agrochemical properties. One of such agrophysical properties of the soil is its bulk mass.

In this regard, a large number of scientific research works have also been carried out, the authors have received substantive reports on the type of crops and their effects on the care, exchange of crops under what conditions.

D.N.Pryanishnikov (1952) studied the positive effect of organic residues of all types of plants on the bulk mass of the soil.

M.A.Belousov, F.I.Ismailov (1960) noted that after the expulsion of nutrient crops into the soil, the bulk mass of the soil decreased from 1,43 g/sm³ to 1,31 g/sm³.

According to American Scientists N.M.Taylor, H.R.Gardner (1963), the high mass of soil volume, that is the very dense location of the soil layer, adversely effects the processes of soil aeration, as a result of which the plant root can not develop freely and ceases to grow.

According to L.A.Spijevskaya (1963), all types of crops multiply the bulk mass of the soil during the period of validity. And after they are driven into the soil, the bulk mass of the soil decreases. During the period of validity of the alfalfa, it was observed that the bulk mass of the soil was 1,38 g/sm³, after plowing it was added 1,27 g/sm³, with alfalfa sudan grass, respectively planted from 1,37 g/sm³ to 1,24 g/sm³, when added with alfalfa raygras from 1,28 g/sm³ to 1,23 g/sm³.

According to M.T.Tadjiev, H.Baykobilov (1972), when the cotton was grown after one-year crops in an exchange planting system under the conditions of barren soils, the bulk mass of the soil was 1,26 g/sm^3, after 2-year alfalfa 1,24-1,25 g/sm^3, after 3-year alfalfa 1,22-1,27 g/sm^3, this indicator was 1,29 g/sm^3 in the field.

M.Muhammadjanov, M.Umarov (1983), soil density should be around 1,1-1,3 g/sm^3 for optimal growth and development of the hemp plant, other plants in general. In this case, the exchange of air in the soil improves, biological activity occurs and a high degree of absorption of nutrients through the roots of the plant is ensured. The plant facilitates the assimilation of difficult digestible nutrients. The main thing is that as a result of the decomposition of organic substances, the substances necessary for plant nutrition decompose.

A.F.Ustinovich (1987) noted that one-year grass cultivation reduced the volume mass of soil to 0,10-0,13 g/sm^3, increased the water permeability of the soil to 1,6 times, and also normalized the growth and development of the soil when the volume mass of the soil was 1,1-1,2 g/sm^3.

According to S.K.Hussein, W.Michlken (1987), great emphasis is placed on planting crops that improve soil agrophysics, leaving as much organic residue in the soil as possible in England.

M.Kurbanov, M. Nasriddinov (1979), the frequent sequential sowing of crops, for example, the addition of millet with corn, will provide for an additional yield of 0,1 t/ha from cotton in the next year.

A.Rakhmatov and according to the results of the experiment conducted by J.Shahimardonov (1981), in the conditions of barren soils of the counter-steppe, one year of cultivation of feed crops reduced the bulk weight of the soil, increased moisture, improved water permeability of the soil, as a result of which, in the coming year, an additional crop was obtained from cotton to 0,5 t/ha.

Z.S.Tursunkhaev, A.S.Bolkunov (1981) recommends planting the following intermediate crops in order to obtain a grain crop twice a year from an area or three times a year: rye, oats, barley, autumn vica, autumn peas, rye, bersim, rapes, perko, triticale, in some cases it was recommended to plant these crops with mutual addition. For example, after a mixture of rye or rye+raps, the yield of the cotton was the highest 4,3-4,4 t/ha.

U.Kh.Mukhamedov (1983)noted that in conditions of typical gray soils, the cultivation of the cotton for three consecutive years after the cornfield provides additional yield from cotton to 0,2-0,5 t/ha in relation to the sow herd.

According to E.P.Gorelov, D.Yarmatova (1983), in the conditions of the Samarkand region the cultivation of the cotton after the bean, compared to the sorghum cotton, the cotton crop increased by 0,2-0,3 t/ha quintals.

Similar results were observed in experiments conducted in 1982-1984 on the fields of Fergana, Bukhara and Samarkand branches of the Scientific Research Institute of cotton selection, seed growing and agrotechnics of the Republic of Uzbekistan (former Scientific Research Institute of cotton growing of Uzbekistan) and additional cotton crop of 0,3-0,4 t/ha was obtained when planted after the of the cotton.

Cultivation of intermediate crops, cultivation of maize after mustard in swapping crops has a positive effect on the increase of humus in the soil, the rapid transition of microbiological processes in it, the increase in biological activity of the soil.

According to H.S.Romanov (1986), the scope of influence of soil agrochemical properties of crops depends on their species and the order in which they are planted alternately. In two years, the average maximum cotton crop was observed in the cotton planted after planting rye and corn blue fodder, rye blue as fertilizer.

According to N.Y.Bespalov, A.Juravilin (1987), the best past crops for the cotton are sudan grass, sun flower, corn, autumn barley, millet, autumn rye. After these crops, the cultivation of the cotton provides an additional yield of 0,6 t/ha from cotton.

According to I.P.Geyderenxtxt, V.D.Werner (1989), the addition of rye with spring raps proved to be more effective than planting rye on a clean plow itself.

According to T.Danilova (1991), R.Tellyaev, X.Romanov (1993), the cultivation of the cotton in a field of monoculture and exchange planting leads to a change in soil fertility, which in turn causes a sharp change in the yield in terms of options. In particular, according to the results of many years of experience of the whitewash Experimental Station, the average yield on typical gray soil was 1,5 t/ha in the fertilizer-free option, 3,2 t/ha when fertilizer was applied, and 3,1 t/ha when fertilizer was fertilized.

According to G.Dorojko, V.Perederieva (2000), fall yields are strongly influenced by past crops. When planted in a continuous field, the activity of micro organism in the soil is slowed down. When sown instead of sown, the average yield was 1,4 t/ha, while grain yield was 3,6 t/ha when sown in the past.

All the scientific conclusions from the above examples prove that the soil fertility is maintained, increased, the agrophysical and agrochemical, microbiological properties of the soil are good, their positive attitude towards the soil proves the dependence of agricultural crop rotation on the correct organization of crop systems. It is noted that all efforts aimed at increasing soil fertility can be canceled if agrotechnical errors are avoided, even if the exchange and sequential planting of crops is not organized or established. But the analysis of literature on the influence of autumn on the fertility of crops, as well as the repeated cultivation of legumes-cereals, intermediate crops, which are sown on its angiogenesis in the exchange of crops, is very rare since the in 1990. There is also no general method for researchers to crop agricultural crops by sharing. This makes it possible to carry out further research on these issues in agricultural science, to make more specific proposals and recommendations in the new agricultural system.

In this book, the authors talk about the results obtained by short-turn exchange planting systems based on the satisfaction of the demand for food products for the maintenance and increase of soil fertility in the years of independence, as well as its role in the future of our country.

CHAPTER II.

THE CONCEPT OF EXCHANGING AGRICULTURAL CROPS AND THE METHOD OF STUDYING THEM IN RESEARCH

The modern concept of the agricultural system-this is a variety of forms of farming, which includes agrotechnical, a set of meliorative measures and intensive use of land, appropriate measures that restore and increase soil fertility.

The method of land use is explained by the ratio of land resources, the structure of the crop areas, the area of agricultural crops and the arable land of the farm, and the methods of increasing soil fertility by a set of agrotechnical and meliorative measures.

An important task of modern farming is to prevent the decline in the yield and quality of crops by sharply reducing the applied mineral fertilizers and their norms, as much as possible reducing the cost of production.

Therefore, under such conditions, the method of increasing crop yields and product quality is the implementation of crop rotation on a biological basis.

As noted above, V.R.Williams said the farming system realized that only one farming system-to be a field of grass, to increase the fertility of the soil on account of the strengthening of humus and soil structure. But he did not take into account the production costs and economic aspects of the farming system.

It is known that the rotation of crops by fields and years on a scientific basis is an alternation of sowing. In the introduction of crop rotation, land plots are divided into approximately the same parts. Each type of crop is planted in each part of the field along the exact sequence (mainly on the system of crop rotation).

Alternating planting with respect to chronic planting ensures the restoration and increase of soil fertility, the use of fertile land.

Exchange planting leads to replenishment and better assimilation of nutrients in soil and fertilizer composition, improvement and preservation of soil physical properties, protection from water and wind erosion, prevention of weeds and protection of agricultural crops from diseases and pests. As a result of crop rotation, soil fertility and yield of agricultural crops will increase significantly.

The structure of crop areas is the ratio of the areas of various agricultural crops cultivated in winter. It is usually expressed in percentage terms of the ratio of some agricultural crop to the total area of all crops, or rather than one crop (a group of crops).

The structure of crop fields- is determined by taking into account the results of crop production, economic efficiency, science achievements, techniques and advanced experience in farmer farms.

The structure of crop fields is determined by taking into account the results of crop production, economic efficiency,science achievements,techniques and advanced experience in farmer farms.For example, in grain-livestock farms, the crop rotation is mainly a group of grain-forage crops, and in exchange, their yield is 55-60%, in poultry-65-70%. In farmer farms specializing in the cultivation of milk, meat and calves, it is desirable that the grain crops occupy 42-52%, technical crops 10-15% and fodder crops 30-40% and plow-20%.

Crop rotation- is an important component of farming. They are the basis of systems for processing, fertilizing and protecting crops from weeds, pests and diseases, and soil from various erosion.

Properly organized crop rotation is of great importance in increasing the culture of farming, the yield of agricultural crops and the profitability of farming.

Such importance of crop rotation is primarily based on the biological characteristics of agricultural crops. Different plants or plants of the same species require different types of nutrients and water procedures, but they simultaneously have different effects on the physical properties of the soil.

The system of exchanging agricultural crops on the basis of scientific on the years and fields is called the system of crop rotation. It consists of different crops, the proportions of which by the year will be different. For example, 1:2, 3 field crop rotation system, the first year of grain (autumn) crops on one field, and the second and third years of the crop are either taken care of, or this system can be carried out with the cultivation of cotton on three fields in one year, the first field is grain (autumn), the second and third fields. In this three-field crop rotation system, two types of crops are involved, the ratio of which is 33,3% of the grain crop and 66,7% of the grain crop. That is, the completion of this three-field crop rotation system in three years means that the crop rotation system has either 1-rotation (the exchange of crops by period) or 1-period. For example, in the above-mentioned 1:2, 3-field crop rotation system, the first year is the spike-grain (autumn) crops, the second year is the cotton-plant, and the third year is also the cotton breeding, with the expiration of the validity period (3-year), this crop rotation system can be considered as the end of the 1-rotation.

A permanent crop is an agricultural crop (for example, alfalfa), which is sown in one field for a certain period of time (from 3 years to 5 years). Continuous crops should not be confused with chronic crops and repeated crops.

Chronic planting is a kind of agricultural sowing, which is sown for a long time (more than 4-5 years) in one field. Chronic planting differs from a constant sowing in the range (in autumn, summer) by plowing the field.

Repeated crop is an agricultural crop that is sown mainly in the summer after the main crops in the system of crop rotation.

Intermediate crop is an agricultural crop that is sown in the intermediate period from the moment the main crop is harvested to the time when the main crop is sown in the system of crop rotation.

It is an agricultural crop that was planted a year before the main crop, which was planted in the system of past crop-sharing.

Part of the crop rotation. It is necessary not to be confused with the system of crop rotation of the crop link. As mentioned above, if the system of crop rotation is understood to be planted alternately on the basis of years and fields of agricultural crops, when the system of crop rotation is said to be part of the crop rotation system consisting of two or three sows and one or three sows. For example, plumage(summer)-winter wheat:corn for silage, oats: winter wheat, etc. In each field of crop rotation, one crop is planted, which gives the opportunity to use complex agricultural techniques and advanced experimental methods.

In the intensification (acceleration) of farming, it will be possible to increase the content of past crops. All this makes it possible to specialize in intensive farming exchanging crops, as well as enrich them with basic crops based on agronomic and economic aspects in obtaining high and quality yields.

In agricultural science and practice, a sharp decrease in productivity has been proved when crops are grown chronically. In the Research Institute of agrotechnologies of cotton selection, seedling and cultivation, the control option of the experiment on continuous and crop rotation of the cotton (chronic cotton), which has been studied since 90 years, the yield of the cotton is an average of 1,0-1,1 t/ha, and in the fields of crop rotation is 2,8-3,2 t/ha. (Full information about this is given in the chapters above). According to the Kharkiv experimental Observatory, when planted in one field for 15 years in autumn, the yield was 0,9 t/ha, while when planted alternately, an average of 1,8 t/ha, the yield of oats was 1,1 and 1,5 t/ha, respectively, in 16 years, the yield of potatoes was 9,5 and 16,7 t/ha. Some crops that are plowed in chronic planting are strongly susceptible to diseases and pests. For example, in the former Dnepropetrovsky experimental Observatory, when sunflower was planted continuously, the yield in the first year was 1,1 t/ha, in the second year 1,1, in the third year 0,4, in the fourth year 0,2, in the fifth year the yield was observed. Such examples can be cited quite a lot. The negative effects of chronic planting can be reduced to a certain extent temporarily only on account of the application of local and mineral fertilizers.

In districts where there is a water shortage, the most effective way to obtain a high and stable harvest from grain crops and to combat drought is to introduce a plowder into this alternating plant. Therefore, the implementation of crop rotation on lands where there is a lack of moisture requires the proper proportions of cereals and plows.

By exchanging agricultural crops, planting is divided into classifications and consists mainly of three types - field, forage and special.

It is worth noting that when various agricultural crops are sown in the crop system, this species is classified according to the type of field crop rotation, if 50% or more of the crops sown in the crop system are sown in the crop rotation, then the type of crop rotation, while the special crop rotation is mainly based on the agronomic and another important requirement for exchanging is economic and organizational requirements.

When it comes to the economic efficiency of the crop rotation, the production of the most products with a minimum of motor and labor costs in one hectare area, the productive use of machinery and other objects-from land to manpower and production equipment-is included.

When designing the rational structure of crop fields, it is necessary to take into account the productivity and economic efficiency of each crop, its impact on soil fertility.

It is known that different plants, depending on their biological characteristics, will have different yields, nutrient units and digestible protein according to the geographic location. This in turn determines the economic effect.

In addition, it is necessary to pay attention to the size and number of the field of crop rotation, since in the productive use of tractors, agricultural machines and other means of production, the effect of this is greater.

In assessing the economic efficiency of the swap planting systems, it is necessary to take into account the following important indicators:

-the yield of crops in crop rotation and the total sum of the main, additional crop;

-feed unit and protein output on account of field unit from crops being sown in the crop rotation system;

-the division of labor in the fields of crop sharing (m/hour) and the allocation of sums (monthly salary, price, depreciation and remont);

-net income (in sums) and consumption of 1 sum from the area to 1 ha when planting on an exchange.

It is necessary to evaluate the crop rotation on not one, but several important indicators.

The ratio of net income received from the field to 1 in crop rotation and annual cost to 1 in crop rotation shows the total economy of the crop, while the ratio of net income to expenditure shows profitability.

It is known that in a number of scientific research institutions, a large number of researchers-researchers or independent researchers-are tormented by the lack of methodologies for conducting research on sharing. It is worth noting that field experiments on exchanging crops require perfection, unlike other field experiments. Such experiments are conducted in two or more fields in the conditions of space and time. The main purpose of this is to achieve accuracy in the experiment (space) as well as reduce time, from more productive use (time). Doing so increases the level of accuracy in the data obtained from experiments, the level of error is reduced, effective use of time is achieved.

Typically, field experiments are conducted for three or more years, depending on the soil, climate, type of crop, as well as the goals and objectives of the experiment. Of course, based on the size of the field of experiment options, experiments on the specified technique are carried out in one field in three or more repetitions, or each year in another-in another field. Data on the growth, development of the plant, as well as on the agrophysics and agrochemistry of the soil are calculated separately every year. And the results obtained in terms of productivity are calculated in terms of the average. But the experiences of exchanging are somewhat different from the usual field experiments in methodological terms. The complexity of these experiments is that firstly, in order to conduct the experiment, in most cases, two or more types of crops are selected, and secondly, it takes a long time for the agricultural crops in the exchanging planting systems to be planted and concluded among themselves in the cross-field cross-section of the year. For example, when the system of short-turn crop rotation 1:2 (the first year of the spike-grain crops, the second and third years of the cotton) is studied for three years, the results obtained for three years will not be enough to recommend them both scientific justification and production. In order for the accuracy in the data to be sufficient, it is required to test this system once again for three years. Simply put, it will be necessary to study this system of crop rotation (1:2) at least in 2-rotation, that is, for six years. But this method can cause inconvenience from the point of view of time to the senior researcher-researcher and independent researcher who wants to deal with this area of study. Therefore, the development of certain methods and methods for the study of agricultural crop sharing planting systems, the use of it as a guide in putting on experiments are subject to the period.

Senior researcher and independent researchers who aim to study in agricultural crop sharing planting systems must first select a field in order to put up the field experience once the dissertation work programmes are prepared and the experimental systems are ready.

When choosing a field of experience, researchers should pay attention to the geographic location of the field, its plane (the field should not be exposed to slope or irrigation and wind erosion), the type of past crop, the agrotechnical measures used in past crop care, the degree of damage to the field with weeds, and other factors, this should be noted in a separate When choosing a field, it is necessary to select in this field as much as possible only the same crop was planted in the previous year, as well as the field where agrotechnical activities were conducted in the same order. If in the chosen field the norms of fertilizers were used, which in the previous year were planted different crops or differ from each other in great measure in their nutrition, then the experiment is considered to have a methodically incorrect beginning. Because under such conditions, nutrients in the field soil (humus, nitrogen, phosphorus, potassium and etc.) the amount vary in different areas of the field and have a different impact on the growth, development and yield of the crops cultivated in this experiment, there may be uncertainties in soil analysis, resulting in loss of accuracy in the experiment.

After selecting the field where the experiment will be conducted, soil samples will be taken and analyzed to determine the agrophysical and agrochemical texture-characteristics of the soil from the experimental field before planting agricultural crops. This is one of the important conditions of experience.

After the soil is taken for analysis, the field is divided into sections and marked (razbivka) with special pegs to accommodate the options in the experimental system.

It should not be forgotten that each option of the experiment should consist of 8 rows, and the area of each option should not be less than 240 m². (This is 60 sm x 60 sm in the range of the 8 range=4,8 meters=240 m²). Then the 1,2,7,8 rows of this option make up the protection row, and the remaining 3,4,5,6 rows make up the calculation row. Also, if the length of the experimental field is 50 meters or less, then the experiment is put on 4 and more repetitions, 50 meters long (from 50 meters to 100 meters), 3 repetitions.

For the purpose of convenience to the reader, we will explain this with the help of examples. For example, the experimental system has the following appearance:

Table 1

Experience system.

№	Crop rotation systems	Years		
		1st year	2nd year	3rd year
1	Constant cotton (control)	Cotton	Cotton	Cotton
2	1:2, (winter wheat: 2 years cotton)	Winter wheat	Cotton	Cotton
3	1:1:1(winter wheat: cotton: winter wheat:)	Winter wheat	Cotton	Winter wheat
4	2:1, (2 years winter wheat: cotton)	Winter wheat	Winter wheat	Cotton
5	2:1, (2 years cotton: winter wheat)	Cotton	Cotton	Winter wheat
6	1:1:1,(soy bean: cotton: winter wheat)	Soy bean	Cotton	Winter wheat
7	1:2, (soy bean: 2 years cotton)	Soy bean	Soy bean	Cotton

The object under study in the experiment is the germ plant, and in the study it is determined the past crop that is favorable for it. 1-th option of the experiment (control) and 5-th option is planted in 1st year cotton, winter wheat to 2,3,4-th option, bean to 6,7-th option.

Now let's consider the scheme of the appearance of the experiment in the field. (Table 2).

This means that the program aims to carry out the experiment in 7 options, the length of the dive is 50 meters. If each option consists of 8 rows, then the area of each option (field length 50 meters x 8 rows x 60 sm rows) will be 240 m². Given that the experiment consists of 7 options, the total area of the first repetition of the experiment (7 option x 240m² (the area of 1 option) is 1680 m² (up to 0,17). The experiment is carried out on 4 repetitions, like the above repetition (1680 m² x 4=6720 m²), the total area of the experiment field will be 0,67 ha.

As mentioned above, it is worthwhile to put the experiences of exchanging planting in space and time. Because, this is achieved with the effective use of time. From this point of view-we will consider this situation also in the scheme. (Table 3)

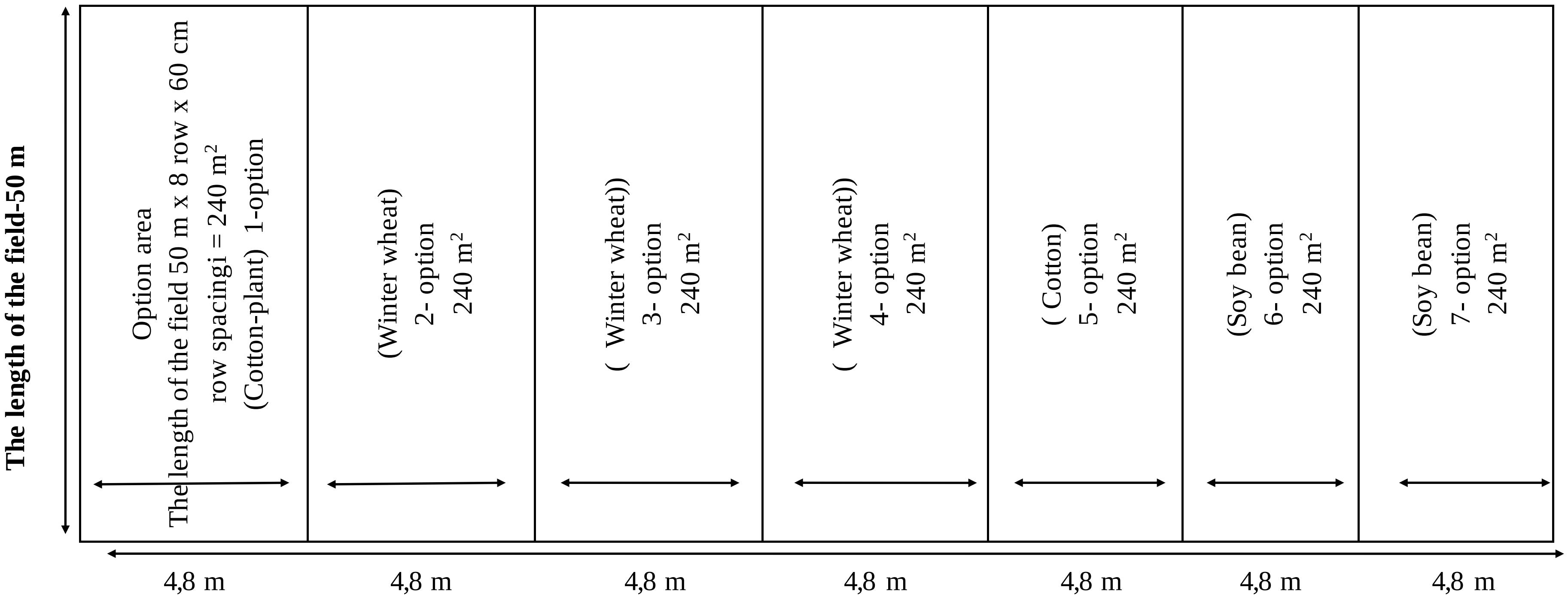
For example, if the experiment begins in 2016 year, the same system of experiments will be conducted in another field in 2017 year. Thus, the experiment will begin in 2016 year and end in 2019 year, that is, not in 6 years, as already mentioned above, but in 4 year.

Data on the features of plant phenology, agrochemical and agrophysicological texture of the soil-are calculated separately for each field, but the data obtained on yield are calculated in the cross-section of fields.

Table 2

VISUALIZATION OF THE EXPERIENCE IN THE FIELD FROM THE OUTSIDE

(1-in the example of repetition)



The wigth of field 33,6 meter

Option length: 8 row (rows in the option) x 60 sm (row spacing)-4,8 meter

*Option area:4,8 meter x 50 meter (*the length of the field*)-240 m²*

The width of field*: 7 option x 4,8 meter-33,6 meter*

Experiment 1-total area of repetition: the length of the field *50 meter x* The width of field *33,6 = 1680 m² (0,17 ha)*

Table 3

Experiment system

№	1-field				2-field			
	Crop rotation systems	Years			Crop rotation systems	Years		
		2016 y.	2017 y.	2018 y.		2017 y.	2018 y.	2019 y.
1	Constant cotton (control)	Cotton	Cotton	Cotton	Constant cotton (control)	Cotton	Cotton	Cotton
2	1:2, (winter wheat: 2 years cotton)	Winter wheat	Cotton	Cotton	1:2, (winter wheat: 2 years cotton)	Winter wheat	Cotton	Cotton
3	1:1:1(winter wheat: cotton: winter wheat:)	Winter wheat	Cotton	Winter wheat	1:1:1(winter wheat: cotton: winter wheat:)	Winter wheat	Cotton	Winter wheat
4	2:1, (2 years winter wheat: cotton)	Winter wheat	Winter wheat	Cotton	2:1, (2 years winter wheat: cotton)	Winter wheat	Winter wheat	Cotton
5	2:1, (2 years cotton: winter wheat)	Cotton	Cotton	Winter wheat	2:1, (2 years cotton: winter wheat)	Cotton	Cotton	Winter wheat
6	1:1:1,(soy bean: cotton: winter wheat)	Soy bean	Cotton	Winter wheat	1:1:1,(soy bean: cotton: winter wheat)	Soy bean	Cotton	Winter wheat
7	1:2, (soy bean: 2 years cotton)	Soy bean	Soy bean	Cotton	1:2, (soy bean: 2 years cotton)	Soy bean	Soy bean	Cotton

CHAPTER III.

ON THE ESSENCE AND ECONOMIC EFFICIENCY OF CHRONIC COTTON, ALFALFA-COTTON AND SHORT-TURN CROP ROTATION IN THE NEW AGRICULTURAL SYSTEM

Cotton yield in chronic cotton and alfalfa-cotton rotation

Maintaining, restoring and increasing soil fertility is one of the most important and urgent tasks in the Republic's agriculture. The study of soil fertility is one of the main tasks of cotton science to determine the amount of humus, nitrogen, phosphorus and potassium contained in the soil and their effect on the yield of cotton.

In carrying out the above and making recommendations for production on the basis of the results of scientific research obtained, we are guided by the data of the experience conducted in the Scientific Research Institute of cotton growing of Uzbekistan (now the scientific research institute of cotton selection, seed production and agrotechnologies of cultivation) since 90 years. 1st option of the experiment based on data, go to 30 t/each year; 2-th option, mining fertilizers to N250 R175 K125 kg/ha year, 3-th option fertilizer-free, 4-th option N150 R100 K50 kg/ha mining fertilizers and 3:7 (alfalfa -cotton) we will analyze the example of systematic crop rotation 9, 10 and 11-rotations.

According to the data obtained, in the 60-th year of the experiment (1985 y.) in the 1st option, which was given to 30 t/ha every year in the cotton out of c grown chronic, the yield of cotton was 2,7 t/ha, in 2015 this indicator (in the next 30 years) was an average of 2,9 t/ha. On aveage, the yield of corn per year is 28-30 t/ha, but only 1992, 1993, 1998, 2003, 2004, 2005, 2007, 2008, 2009-in years, these indicators correspond to 1,8-2,2-2,1-2,0-1,9-1,4-2,2-2,3-1,8 t/ha it was determined. In the 2nd option of the experiment, the highest yield was observed in 1988 to 3,6 t/ha, in 1989 to 3,7 t/ha, in 1990 to 3,8 t/ha, in 1995 to 3,8 t/ha, in 2001 to 3,7 t/ha, in 2006 to 3,4 t/ha, in 2010 to 3,3 t/ha, in 2011 to 3,7 t/ha, in 2012 to 3,9 t/ha The minimum productivity was 2,1 t/ha in 1992, 1,8 t/ha in 1993, 1,5 t/ha in 2005, 2,5 t/ha in 2008, 2,4 t/ha in 2009. It should be noted that in the 3-th option of the experiment, where the fertilizer was not applied, the yield of sorghum was on average 1,4-1,6 t/ha only on account of the natural fertility of the soil. Even in 1986 it was 2,0 t/ha, in 1989 it was 1,9 t/ha, in 1995 it was 1,8 t/ha, in 1997 it was 1,8 t/ha, in 1998 it was 1,8 t/ha, in 2001 it was 1,8 t/ha. But in some years, in particular in 2004-2014 years, the yield of corn was observed to be 0,5-1,2 t/ha.

On the example of the exchange of cotton with alfalfa (3:7), the experiment analyzed the 5-option 9, 10, 11-rotations. In this 9-rotational corn yield after the 3-year alfalfa (1985-1987 y) 1-st year 3,9 t/ha, 2,3 and 4-respectively 4,0; 3,9 and 3,3 t/ha, 5, 6, 7-years on the basis of this figure 2,2, 1,5, 2,9 t/ha was observed. It is noteworthy that after the care of the alfalfa 5, 6 and 7 years, the yield of the alfalfa decreased. In both the 10 and 11-rotations of the experiment, the above legalities were observed (Table 4).

A similar multi-year experience was conducted in the conditions of the meadow-alluvial soils of the Bukhara scientific Experimental Station of the scientific research institute of Agrotechnologies of cotton selection, seeding and cultivation. According to the data obtained, after 3-year alfalfa in the 6-field (3:3) option of the seed-clover crop system, the yield of the seed after 1-year planting of the cotton was 3,4 t/ha, in the 2-year 3,7 t/ha, in the 3-year-3,4 t/ha. This is the control option in the experiment 2,3 t/ha corresponding to the cotton crop; 2,6 and 2,3 t/ha, N200 R140 K100 kg/ha fertilizer support 0,4 t/ ha from the cotton crop of cotton breeding option; 0,5 and 0,8 t/ha additional yield means.

Support of experience in mineral fertilizers (N200 R140 K100 kg/ha) cotton yield in cotton breeding options averaged 2,8-3,2 t/ha, relatively high indicators 1999, 2004, 2005, 2006, 2010, 2011 and observed in 2012 year, they corresponded 3,68, 4,38, 4,17, 4,34, 4,12, 4,35 and 4,2 t/ha it was. The lowest index was observed in 1998 and 2000 years-3,4; to 3,39 t/ha. Cotton yield did not exceed 1,03-1,45 t/ha in the option where the manure was planted without application. Only in 2003, 2006, 2007 and 2008 these indicators were respectively 1,94, 1,83, 1,59, 1,75 t/ha and received high yields (Table 5).

Table 4

Cotton yield in chronic cotton and cotton-alfalfa crop rotation, t/ha

(Cotton Selection, Research Institute of agrotechnologies of seeds and cultivation, Central Experimental area)

Years	Experiment participants	Every year 30 t/ha manure (from 1926 yr.)	Options			
			$N_{250}R_{175}K_{125}$ kg/ha (from 1926 yr.)	Without fertilizer (control) (from 1926 yr.)	$N_{150}R_{100}K_{50}$ kg/ha (from 1926 yr.)	Crop rotation (3:7) $N_{150}R_{100}K_{50}$ kg/ha (from 1936 yr.)
1985	A.Bolkunov V.E.Kurochkin	2,72	3,43	1,2,3	27,7	1-st year alfalfa
1986	-//-	3,46	3,15	1,9,6	33,3	2-nd year alfalfa
1987	-//-	2,93	2,93	1,6,9	21,2	3-rd year alfalfa
1988	-//-	3,58	3,58	1,6,7	33,4	39,0
1989	B.Muhiddinov V.E.Kurochkin	3,61	3,74	1,9,0	33,8	40,1
1990	-//-	3,64	3,80	1,7,0	34,4	39,7
1991	-//-	2,75	2,95	1,6,6	28,9	33,4
1992	-//-	2,86	2,15	1,2,7	22,8	22,3
1993	R.SH.Tillaev V.E.Kurochkin	2,27	1,85	1,3,2	15,3	15,7
1994	-//-	2,67	2,38	1,4,3	27,4	29,6
1995	R.SH.Tillaev B.M.Khalikov	3,28	3,77	1,8,4	33,1	1- st year alfalfa
1996	-//-	2,48	2,91	1,5,0	25,8	2- nd year alfalfa
1997	B.M.Khalikov S.Choldanbaev	2,89	3,43	1,8,3	26,1	3- rd year alfalfa
1998	-//-	2,10	2,31	1,8,4	20,1	24,9
1999	-//-	2,88	2,57	1,7,1	23,3	30,1
2000	-//-	3,28	3,39	1,7,1	28,8	32,5
2001	-//-	2,80	3,68	1,8,5	30,7	32,2
2002	-//-	2,35	2,62	1,3,3	23,8	28,4
2003	-//-	2,05	2,97	1,0,2	23,1	22,8
2004	-//-	1,93	2,90	0,95	22,1	23,1
2005	B.M.Khalikov F.B.Namozov	1,79	2,21	0,80	17,9	1st year alfalfa
2006	-//-	2,92	3,42	0,14	27,7	2nd year

						alfalfa
2007	-//-	2,20	2,80	0,88	22,3	3rd year alfalfa
2008*	-//-	2,30	2,54	0,76	18,6	23,6
2009*	-//-	1,84	2,43	0,53	17,1	20,5
2010	-//-	2,88	3,30	0,91	27,4	31,8
2011	-//-	3,24	3,76	0,98	32,8	42,0
2012	-//-	3,15	3,88	0,86	32,5	38,7
2013	-//-	3,81	4,74	0,93	38,5	35,1
2014	-//-	3,63	4,09	0,91	35,9	35,3
2015	B.M.Khalikov H. Bozorov	2,85	3,80	0,83	3,25	1- st year alfalfa
2016	-//-	3,16	3,96	0,82	2,86	2- nd year alfalfa
2017	-//-	2,94	3,34	0,88	3,17	3- rd year alfalfa
2018	-//-	3,19	3,63	0,89	3,41	3,74
2019	-//-	3,47	3,93	1,18	3,67	4,23
2020	-//-	2,27	2,43	1,16	3,14	3,65
Average	-//-	2,76	3,10	1,21	2,70	3,15

Note. ***In the spring of these years, due to the fact that the weather is unfavorable for planting seriog and seedlings, the seedlings are planted again in late terms.***

According to the data obtained from the experiment conducted on the soils of the scientific Experimental Station of the Surkhondarya Psueait, the cotton yield in the 3:6, 9-branched cotton system was 4,02 t/ha in the 1st year after 3-year alfalfa, while in the 2nd year it was 3,88 t/ha, 3,4 and 5- years 4,29; 3,25; 4,08 t/ha and cotton yield was 2,9-3,5 t/ha in the breeding options of pig mineral fertilizers (N250 R175 K125 kg/ha). In the case of unfertilized, muttasilated sow options, the yield was observed to be 1,8-2,0 t/ha (Table 6).

In place of the summary, we can say that the cotton is 6, 9, 10 field 3:3, 3:6, 3:7 care for 3-4 years after the quail in the alternation planting systems ensures a higher yield. During the next 5, 6, 7-th years of care, its yield has decreased and does not yield economically. Cotton yield in the care of soil without fertilizers, typical for many years in the conditions of porous and meadow-alluvial soils is an average of 0,8-1,2 t/ha on account of the natural fertility of the soil, and in rough soils-1,4-1,6 t/ha on average.

Table 5

Crop yield of cotton on the fields of chronic cotton and cotton-alfalfa crop rotation

(Cotton Selection, Research Institute of agrotechnologies of seeds and cultivation, Bukhara scientific Experimental Station, meadow-alluvial soils)

№	Options	Cotton fertile, t/ha																	
		Years																	
		1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1	3:3 (Alfalfa: cotton)	alfalfa 3rd year	3,40	3,68	3,39	alfalfa 1st year	alfalfa 2nd year	alfalfa 3rd year	4,38	4,17	4,34	alfalfa 1st year	alfalfa 2nd year	alfalfa 3rd year	4,12	4,35	4,25	alfalfa 1st year	alfalfa 2nd year
2	Chronic cotton (fertilizer) N_{200} R_{140} K_{100}	3,47	3,04	3,18	2,55	2,98	2,64	3,14	2,99	3,02	3,53	3,67	3,26	2,82	3,25	3,13	2,98	3,56	3,21
3	Chronic cotton (without fertilizer)	1,26	1,13	1,03	1,05	1,21	1,36	1,94	1,3	1,35	1,83	1,59	1,75	1,27	1,5	1,33	1,21	1,45	1,37

Table 6

Crop yield of cotton on the fields of chronic cotton and cotton-alfalfa crop rotation

(Cotton Selection, Research Institute of agrotechnologies of seeds and cultivation, scientific Experimental Station of Surkhandarya, bald soil)

№	Options	Cotton fertile, t/ha																	
		Y e a r s																	
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	3:6 (Alfalfa: cotton)	alfalfa 3rd year	4,02	3,88	4,29	3,25	4,08	3,43	alfalfa 1st year	alfalfa 2nd year	alfalfa 3rd year	4,05	3,12	3,34	3,46	3,27	2,7	alfalfa 1st year	alfalfa 2nd year
2	Chronic cotton (fertilizer) N_{250} R_{180} K_{125}	3,13	2,92	2,79	3,65	2,96	3,57	3,31	3,40	3,20	3,10	3,11	2,94	3,08	3,45	3,3	2,79	2,75	3,51
3	Chronic cotton (without fertilizer)	1,82	1,81	1,75	1,74	1,79	2,05	1,74	2,04	1,78	1,71	1,68	1,66	1,54	1,71	1,62	1,41	1,42	1,54

The root remains of agricultural crops and the nutrient elements contained in them in the exchange of alfalfa-cotton

Scientists have written dozens of books, hundreds of recommendations-brochures about the fact that alfalfa is the best plant of the past in Uzbekistan, the republics of Central Asia, which grow molasses, Azerbaijan. Even so far, this crop is interesting to scientists and specialists with its biological characteristics.

Since the 30-years of the last century, in-depth scientific research work on this crop has been carried out. One of such studies was the study of root residues that leave the alfalfa in the soil and the nutrient elements contained in it. According to information obtained by several scientists in different years and in different soil-climatic conditions, on average in the first year the alfalfa collects about 5-8 tons per hectare, in the second year 7-17 tons, and in the third year from 9 tons to 21 tons of root mass, that is, it is proved that such a large amount of valuable organic. These indicators are data only on the root of the quail, after the alfalfa is planted, the top layer of the soil also leaves the remains of stubble in the amount of 3-5 tons hectare.

It should be noted that the amount and quality of nutrients (N, P, K) contained in the root residues left by the alfalfa in the soil is not determined by the content of the root of any plant piece this time. Although this analysis has been studied by many scientists, but we are directly involved in this classic experiment.We used the data from A.Azizov. Above, it was said that the alfalfa leaves the root residue on average 5-8 tons in the 1st year, referring to the remains of roots left in the soil by the years. If the alfalfa leaves 6 tons of residue in the 1-st year, its content will be 28-40 kg/ha, R 11-20 kg/ha, K 10-15 kg/ha, and when leaving 8 tons respectively 50-65 kg N, 20-30 kg R, 36-45 kg K substance. In the 2-nd year care of alfalfa, 10 tons of residual content 75-100 kg N, 27-55 kg R, 78 kg K, while 12 tons of root residue 105-140 kg N, 40-65 kg R, up to 115 kg K substance, 3-rd year care when leaving 14 tons of root residue.

Table 7

Different soil-climatic conditions and accumulation of alfalfa root residues in the alternation planting system, kg/ha

(0-40 sm)

№	Performers	Place of experiment and soil type, year	Alfalfa nursing years		
			1st year	2nd year	3rd year
1.	G.I.Meerson	1939 y. AKSAS SoyuzNIKHI, typical gray soil.	7,5	12,4	17,6
2.	L.P.Belyanova	1950-1959 y. Tojikiston Vakhsh station	8,0	17,0	21,0
3.	M.M.Kononova	1951 y. Pahtaorol, light gray soil	6,2	6,7	10,8
4.	I.I.Madraimov	1951 y. AKSAS SoyuzNIKHI, typical gray soil	6,3	10,7	12,5
5.	F.I.Ismailov	1951 y. AKSAS SoyuzNIKHI, typical gray soil	5,2	10,5	12,6
6.	P.M.Bodrov	1971 y. AKSAS SoyuzNIKHI, typical gray soil	7,8	10,6	11,5
7.	R.Saburov	1984 y. SEB SoyuzNIKHI, typical gray soil	-	-	9,8
8.	A.S.Bolkunov	1984 y. SEB SoyuzNIKHI, typical gray soil	8,1	8,5	9,0
9.	A.T.Azizov	1986 y. SEB SoyuzNIKHI, typical gray soil	-	-	9,7

Table 8

The root remains of the three-year-old alfalfa and the amount of nutrients contained in them (kg/ha)

(0-40 sm.)

№	1st year alfalfa				2nd year alfalfa				3rd year alfalfa			
	Root mass, t/ha	N	P	K	Root mass, t/ha	N	P	K	Root mass, t/ha	N	P	K
1.	6,0	28-40	11-20	10-15	9,0	67-80	22-40	60	12,0	110-150	45	120
2.	7,0	33-55	13-25	21-25	9,5	70-90	25-50	65	12,5	125-170	65	140
3.	7,5	41-60	16-28	34-40	10,0	75-100	27-55	78	13,0	130-180	65	175
4.	8,0	50-65	20-30	36-45	10,5	78-115	29-60	86	13,5	140-185	70	200
5.	8,5	60-75	25-35	40-50	11,0	95-125	37-65	95	14,0	155-200	75	216
6.					11,5	101-130	39-65	108	14,5	165-210	70	233
7.					12,0	105-140	40-65	115	15,0	180-240	75	275
8.									16,0	195-270	78	290

155-200 kg N, 75 kg R, 216 kg K, when leaving 16 tons of root residues, respectively 195-270 kg N, 78 kg R, up to 290 kg K substance can leave (Table 8). These indicators are only in the composition of the root, and the body is the amount of biological nitrogen that passes into the soil as a result of the rupture of air-assimilated biological nitrogen and nodular bacteria with the help of azotobacters during growth and development, and the nitrogen content in the surface layer of the soil is not taken into account.

Above, we touched on the importance of the alfalfa, its root and the remains of angiosperms that leave in the soil for 3 years, as well as the amount of nutrients contained. Now we will dwell on the amount of organic residues left in the soil by agricultural crops grown in the current rapidly developing new agricultural system, more precisely in the short-turn crop rotation systems, and on the chemical elements contained in them, and we will analyze the comparative importance of agricultural crops grown in the short-turn crop rotation systems for as is known, during the period of validity of any agricultural crop significantly removes nutrients from the soil. After harvesting, a certain number of nutrient elements return to the soil as an organic substance through the root of the plant's angri (residual stem). In addition, some roots of crops that are planted as a repeated or intermediate crop turn into organic matter as soon as they are valid.

Autumn-winter intermediate crops also have a high impact on soil fertility. They enrich the soil with pure organic substances, as a result of which the biological activity of the soil increases, the amount of water-soluble organic substances and fresh, actionable substances that form humus increases. In the experiments carried out for many years, at the end of the validity period each year separately, the amount of angiosperms and root residues left by each plant in the soil was studied up to a layer of 0-50 sm of soil. According to data from studies conducted under the conditions of typical gray soils, at the end of the autumn period of application, the root residues were left to 1,18-1,65 t/ha in the middle account, 2,18-2,66 t/ha, while the repeated beans left root residues to 0,64-0,95 t/ha, the root residues to 1,17-1,94 t/ha it was observed.That the intermediate crop rye to 1,14-1,43 t/ha of stubble, left root residues

1,84-2,35 t/ha. The data from another study are also close to these indicators, the of winter wheat 1,14-1,45 t/ha of the root residues, 2,11-2,75 t/ha of the root residues, the repeated beans leaves 0,66-0,74 t/ha stubble, 1,57-1,68 t/ha of the intermediate crop triticale leaves, 1,14-1,38 t/ha of it was determined, the root remains to 2,07-2,58 t/ha,while the bean planted as the main crop 0,81-0,95 t/ha, that the root remains to 1,74-1,89 t/ha remained.

Analysis on the total number of angiosperms and root residues left by the crops in the research options showed that the highest figures were found in the 5th variant of the experiment (winter wheat+repeated crop (beans) : winter wheat+repeated crop (beans) : cotton, 2:1) and 6-option (winter wheat+repeated crop (beans) : winter wheat+repeated crop (beans)+intermediate crop (rye): cotton, 2:1), In this for a total of 3 years, the plants left roots and stubble or organic residues to 12,93-16,80 t/ha. A small amount of organic residues compared to the above options were observed in the 3-rd option of the study (cotton: winter wheat+repeated crop+intermediate crop (rye): cotton, 1:1) and 4-th option (cotton +intermediate crop (rye): cotton: winter wheat+repeated crop beans 1:1) to 8,89-8,44 t/ha. And the minimum number of indicators was determined by the control of the experiment, that is 1:1, cotton: winter wheat: 1-st option (3,42 t/ha) in the form of a cotton. (Table 9).

According to the data from a second study, at the end of the winter wheat period of validity, the maximum number of roots and stubble during the years in which the study was conducted, with the exception of the root to 1,14-1,45 t/ha, root to 2,11-2,73 t/ha, repeated beans 0,66-0,74 t/ha, root to 1,57-1,68 t/ha, intermediate crop (triticale) 1,14-1,38 t/ha stubble,leaving root remains 2,07-2,58 t/ha, 4-option (1:1:1, winter wheat+ repeated crop (beans) +intermediate crop (triticale):cotton+ intermediate crop (triticale): bean) was observed -16,09 t/ha. In the 5-th option of the study (1: 1: 1, winter wheat+repeated crop+intermediate crop: bean:cotton) and 6-th option (winter wheat+repeated crop (beans): cotton+intermediate crop (triticale): bean) while these indicators were respectively 12,09-11,68 t/ha (table 10).

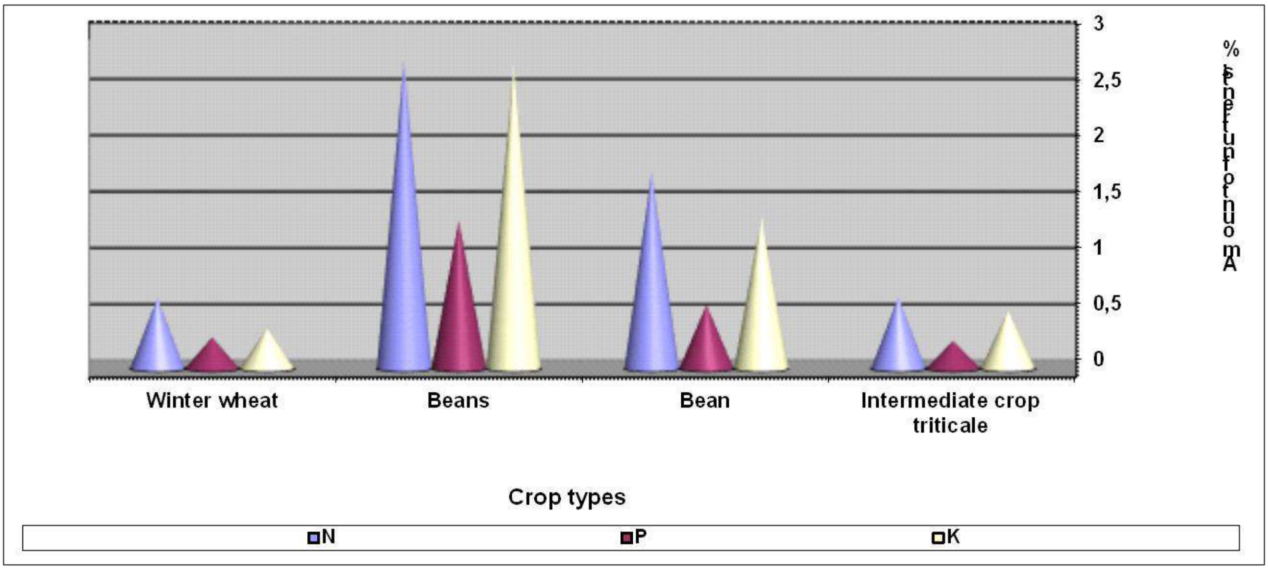
A detailed understanding was given of the organic residues left in the soil of agricultural crops grown in alfalfa and now in short-turn crop rotation systems. Now we will analyze the comparative analysis of the chemical elements contained in organic residues left in the soil by these crops and the question of their return to the soil through organic residues.

As noted above, any crop itself, together with it, removes various elements of nitrogen, phosphorus and potassium from the soil. If a part of these removed elements is lost along with the harvest, a part is lost to the account of the reaped stake. But, on the account of the root remains, especially of the root of the plant that remains in the soil, these elements can also return to the soil.

In order to clarify the issue, the nitrogen, phosphorus and potassium content of the root and root of the plants were analyzed in laboratory conditions. According to the information obtained 100g. of autumn leaves in the dried root part 0,416% nitrogen, 0,157% phosphorus, 0,217% potassium, in the angiotic part 0,214% nitrogen, 0,126% phosphorus, the presence of 0,146% potassium element, 100 g of beans from leguminous grain crops. in the dried root part, NPK is correspondingly 1,46% (N)-1,0% (P_2O_5)-1,05 % (K_2O), in the stubble part 1,29 % (N)-0,32(P_2O_5)-1,6 %(K_2O), while in the root part of the bean NPK is 1,29% (N)-0,37 % (P_2O_5)-0,6 % (K_2O), in the stubble part 0,46% (N)-0,2 % (P_2O_5)-0,75 % (K_2O) if the presence of the element was observed, then in the root composition of the intermediate crop triticale it was observed that the NPK was 0,363-0,145%, and in the root composition was 0,277-0,107% (1-th drawing).

The data obtained were obtained by multiplying the amount of root and stubble residues of the plant, when calculated, by exchanging the 1:1:1 (5, 6-opt) winter wheat + repeated crop (beans) + intermediate crop (triticale): bean: cotton, winter wheat + repeated crop (beans): cotton + intermediate crop (triticale): for three years in bean link the highest amount of nitrogen, phosphorus and potassium returned to the soil through the roots and stubble was observed. In these options, the indicators were N-50,4-50,2 kg, P_2O_5-22,5-22,6 kg, K_2O-28,9-29,0 kg/ha, respectively, according to the repeated crop-beans, N-135,5-138,8, P_2O_5–65,0-66,6, K_2O-133,1-136,3 kg/ha, according to the intermediate crop-rye N-24,2, P_2O_5-9,5 kg/ha. (Table 9).

Therefore, in the current period in which short-turn crop-grain-cotton planting systems are used in farmer farms, legumes-grain crops after autumn winter, intermediate crops in the autumn-winter period, legumes-grain in some years



1- drawing. The amount of nutrients in the roots and stubble of secondary and intermediatecrops after winter wheat.
(Desiccate 100 gr. as a percentage of plant organ)

the introduction of bean as the main crop ensures the accumulation of organic residues in the soil from 8 to 16 tons per hectare in 2,5-3 years on average, leaving in the soil a biological nitrogen of 155,2-213,2 kg/ha, phosphorus in the amount of 64,2-98,6 kg/ha, potassium element in the amount of 112,8-165,2 kg/ha.

In the above parts of the book, we touched on the organic remains of plants that leave on the soil, the amount of chemicals contained in them and the return of these chemicals to the soil through organic residues. Of course, it is natural that the reader is also interested in the amount of nutrients that different agricultural crops absorb from the soil. Now we will dwell on this issue and briefly analyze the results obtained.

It is known that any agricultural crop is practiced-during the period of growth, various mines, organic fertilizers and substances are needed and absorb them in a certain amount.

The results obtained when the process of mine cultivation of crops is investigated in the exchange systems can be the basis of our above opinion. In the course of the research, nitrogen, phosphorus and potassium content of fall, beans, bean and intermediate crop rye and triticale were determined, as well as each organs (except root and stubble residue) coming out of the field.

According to the information obtained, 100 g. the amount of nitrogen in the dried winter wheat is 0,3-0,4%, the leaf content is 0,40-0,45%, in the spike 1,1-1,15%, in the grain 2,13-2,17%, as well as the amount of phosphorus, respectively 0,25-0,27%-0,14-0,20%-0,50-0,57% and 0,95-0,98%, respectively, the amount of potassium 1,40-1,45%-1,0-1,05%-0,95-1,0% and it was 1,23-1,26%.

The beans 100 g. planted as a repeated crop after the cotton the content of nitrogen in the dried stalk is 0,40-0,45%, the content of the harvested horn is 0,60-0,63%, the content of legumes is 0,70-0,73%, the content of grain is 1,08-1,11%, the amount of phosphorus is corresponding 0,20-21%-0,25-0,27%-0,16-0,18% and 0,70-0,75%, and the potassium content accordingly 1,0-1,05%-0,55-0,60%-0,70-0,75% and it turned out to be around 1,30-1,35%. If the content of nitrogen in the stem of the soybeans planted as the main crop was 0,70-0,73%, in the leaf part 0,95-0,97%, in the harvested branch 0,50-0,55%, in the leg 0,75-0,77%, in the seed part 1,20-1,24%, the amount of phosphorus correspondingly 0,20-0,24%-0,20-0,22%-0,20-0,21%-0,22-0,24%-0,63-0,68%, as for the amount of potassium 0,70- 0,75% - 0,85 - 0,90% - 0,55 - 0,60%-0,25-0,30%-0,55-0,60% it was observed. In the composition of the intermediate crop rye stem nitrogen 0,60-0,66%, phosphorus 0,17-0,19%, potassium 1,25-1,27%, leaves respectively 0,80-0,86%; 0,22-0,24%; 1,0-1,10% ni made up. Each vegetative organ of plants is 100 g. according to the results obtained from the calculations on the chemical elements assimilated by the plant (except for the root and angular residues) by means of the existing chemical elements contained in the dry mass, a total of 4,91-5,36 g. in the composition of the winter wheat stem, leaf, spike nitrogen in the amount of, 2,4-2,9 g. phosphorus, 6,23-7,06 g. it was determined that the amount of potassium in it will be absorbed. If these indicators were to be multiplied by the mass and amount of the sumon and grain, generally the upper part of the Earth, taken from one hectare, it was determined that during the period from seed sowing to harvesting, it would absorb 150-160 kg of nitrogen per hectare from the soil, 70-80 kg of phosphorus, 180-200 kg of potassium.

After the fall, 100 g. of each organ of the top-ground vegetative organs of the beans plant, which is planted repeatedly, are poppies, leaves, twigs, legumes, cereals. if the dry mass contains a total of 24,5-26,0 g. nitrogen, 15,1-16,3 g. phosphorus, 34,1-36,6 g. potassium element, these indicators were observed to absorb 71,6-80,1 kg nitrogen, 45,5-49,5 kg phosphorus, 100,5-113,5 kg potassium element per hectare.

Also, during the period of validity of the planted bean as the main crop contains 28,7-30,3 g. nitrogen, 7,8-8,4 g. phosphorus and 15,4-16,8 g. potassium element, 94,0-104,2 kg/ha nitrogen, 12,7-14,3 kg phosphorus, 57,5-62,6 kg potassium element. The intermediate crop rye absorbs 77,3-94,0 kg of nitrogen, 21,6-27,1 kg of phosphorus and 132-156,6 kg of potassium.

Apparently, the winter wheat and intermediate crop of nitrogen in the soil absorbs more rye, and legumes-grain crops in relatively small quantities. It was observed that the demand for the potassium element was high both in winter wheat and in rye, and in beans. However, this legislation is proved in the soy crop.

1:1 of crop rotation: winter wheat: in the fall of the crop system, 145,2 kg of N, 71,8 kg of P_2O_5, 175,6 kg of K_2O element has mastered, in the same system these indicators are used when repeated crop beans is sown 221,8-121,9-286,5 kg, or cotton: wheat+repeated crop (beans)+intermediate crop : NPK respectively in the cotton system 320,1-149,1-479,7 it was found that in the amount of kg, nutrients were absorbed. The most abundant intake of nutrients in the study was observed in the 6-th option (2:1, winter wheat+repeated crop (beans):winter wheat +repeated crop (beans)+intermediate crop (rye) : cotton) indicators NPK 560,6-282,2-776,6 kg/ha. made up. In another study, nearly similar legalities were observed, and the amount of nutrients assimilated as a result of consecutive cultivation in an area of winter wheat is the highest indicator of NPK 464,1-214,5-555,5 kg/ha bean. When winter wheat is swapped with cotton wool, these indications NRK 320,0-161,7-411,9 kg/ha it amounted.

It is worth noting that all the above information is part of the plant, which is mainly assimilated by the terrestrial organs. Except for the amount of root and angular residues left by plants in the soil and the amount of N, P_2O_5 and K_2O contained in them.

Of these data, the amount and balance of nitrogen, phosphorus and potassium elements left in the soil after the end of rotation in the exchange planting systems taking into account the mineral fertilizer given during plant care was calculated.

According to the data obtained, the maximum amount of nitrogen in the soil after the end of rotation in the exchanging sowing system was observed in the 5th option of the study, namely 2:1, winter wheat+ repeated crop (beans) winter wheat+ repeated crop (beans) : cotton and 2:1, winter wheat+repeated crop (beans) winter wheat + repeated crop (rye) : cotton (6-option) left. In these indicators in 5-th option 145,2 kg/ha, in the 6-th option 132,6 kg. made up. In the 2, 3, 4-th option of the study, respectively, was 72,1; 44,5; 35,8 kg (table 11).

According to data from another study, it was observed that even when planted in the winter wheat it left 57,8 kg of nitrogen hectare for three years. And the highest indicator is the 5-th option of the experiment, namely 1:1:1, winter wheat + repeated crop (beans)+intermediate crop(triticale): bean: observed in the cotton system - 134,7 kg (table 12).

Based on the above information, we can conclude that the crop rotation 2:1, winter wheat + repeated crop (beans): winter wheat + repeated crop (beans): cotton or winter wheat + repeated crop (beans) : winter wheat + repeated crop (beans) + intermediate crop (rye) : cotton and 1:1:1, winter wheat + repeated crop + intermediate crop (triticale) : bean: one in the systems of cotton after rotation, biological nitrogen accumulates in the soil in the amount of 185-215 kg.

Apparently, as a result of repeated, intermediate and grain-grain crops, organic residues are collected from 8 to 16 tons per hectare for three years in the crop rotation systems. In this regard, if we look at the information presented in (table 4) of this book, it will be known that from 1939 to 1986, that is, in the researches of 9 scientists who devoted themselves to the scientific research work directly to the alfalfa,the amount of root and root residues left in the soil for 3 years on average from 9 tons to 21 tons.

Table 9

The amount of nutrients contained in the root and stubble of repeated and intermediate crops planted after the winter wheat

№	1999-2002 years												1999-2002 years of total, kg/ha.			
	Winter wheat				Repeated crops (beans)				Intermedite crops (rye)							
	Root total and stubble quantity, t/h.	N t/ha.	P t/ha.	K t/ha.	Root total and stubble quantity t/ha.	N t/ha.	P t/ha.	K t/ha.	Root total and stubble quantity, t/h.	N t/ha.	P t/ha.	K t/ha.	Root total and stubble quantity, t/ha.	N t/ha.	P t/ha.	K t/ha.
1	3,42	2,15	0,96	1,24	-	-	-	-	-	-	-	-	3,42	2,15	0,96	1,24
2	3,47	2,18	0,98	1,26	2,26	6,21	2,98	6,10	-	-	-	-	5,73	8,39	3,96	7,36
3	3,58	2,25	1,01	1,30	1,81	4,97	2,38	4,88	3,50	2,24	0,88	-	8,89	9,65	4,27	6,18
4	3,52	2,21	0,99	1,27	1,94	5,38	2,56	5,23	2,98	1,90	0,75	-	8,44	9,44	4,30	6,50
5	8,00	5,04	2,26	2,90	4,93	13,5	6,50	13,3,	-	-	-	-	12,93	18,5	8,76	16,2
6	7,97	5,02	2,25	2,89	5,05	13,8	6,66	13,6	3,78	2,42	0,95	-	16,80	21,3	9,86	16,5

Table 10

The amount of nutrients contained in the root and stubble of repeated and intermediate crops planted after the winter wheat, kg/ha

№	Experience options	2002-2005 years																2002-2005 total of years			
		Winter wheat				Repeated crop(soy bean)				Intermedite crop(rye)				Main crop (soy bean)							
		Total stubble and quantity root, t/h	N	P	K	Total stubble and quantity root, t/h	N	P	K	Total stubble and quantity root, t/h	N	P	K	Total stubble and quantity root, t/h.	N	P	K	Total stubble and quantity root, t/h.	N	P	K
1	Cotton (control)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Winter wheat (control)	11,40	71,8	32,2	41,3	-	-	-	-	-	-	-	-	-	-	-	-	11,4	71,8	32,2	41,3
3	1:1 Winter wheat: cotton: Winter wheat	7,44	46,8	21,0	27,0	-	-	-	-	-	-	-	-	-	-	-	-	7,44	46,8	21,0	27,0
4	1:1:1 Winter wheat + repeated crop + intermedite crop: cotton + intermedite crop:soy bean	3,47	21,8	9,8	12,6	2,42	66,5	31,9	65,3	7,65	48,9	11,0	-	2,55	44,6	14,5	34,4	16,09	181,8	67,8	112,3
5	1:1:1 Winter wheat + repeated crop + intermedite crop:soy bean: cotton	3,71	23,3	10,4	13,4	2,23	61,3	29,4	60,2	3,31	21,8	8,3	-	2,84	49,7	16,3	38,3	12,09	156,1	64,2	111,9
6	1:1:1 Winter wheat + repeated crop: cotton + intermedite crop:soy bean	3,33	20,9	9,4	12,0	2,29	62,9	30,2	61,8	3,28	20,9	8,2	-	2,89	50,5	16,4	39,0	11,68	155,2	64,2	112,8

Table 11

The assimilation of nutrients in the soil by agricultural crops in short-turn crop rotation systems and their balance

Options	1999-2000 yrs.			2000-2001 yrs.			2001-2002 yrs.			1999-2002 yrs. The total amount of nutrients assimilated during ,kg/ha			The amount of nutrients left in the soil by the roots and remnants of cereals and legumes, kg/ha			The amount of fertilizers applied in the care of cereals and legumes, kg/h (1999-2002 years, pure case)			The amount of nutrients returned to the soil, kg/ha		
	N	R_5O_5	K_2O	N	R_5O_5	K_2O	N	R_5O_5	K_2O	N	R_5O_5	K_2O	N	R_5O_5	K_2O	N	R_5O_5	K_2O	N	R_5O_5	K_2O
1	-	-	-	145,2	71,8	175,6	-	-	-	145,2	71,8	175,6	21,5	9,6	12,4	150	75	50	+26,3	+12,8	-133,2
2	-	-	-	221,8	121,9	286,5	-	-		221,8	121,9	286,5	83,9	39,6	73,6	210	105	100	+72,1	+22,7	-112,9
3	-	-	-	221,7	121,4	314,1	98,4	27,7	165,6	320,1	149,1	479,7	94,6	42,7	61,8	270	135	110	+44,5	+28,6	-307,9
4	-	-	-	88,0	41,2	15,7	240,6	129,2	321,9	328,6	170,4	472,6	94,4	43,0	65,0	270	135	110	+35,8	+7,6	-297,6
5	233,0	125,3	307,1	227,7	122,6	294,9	-	-	-	460,7	247,9	602,0	185,9	87,6	162,1	420	210	180	+145,2	+49,7	-259,9
6	224,5	120,3	298,7	234,8	125,8	308,5	101,3	36,1	169,4	560,6	282,2	776,6	213,2	98,6	165,2	480	240	200	+132,6	+56,4	-411,4

Table 12

The assimilation of nutrients in the soil by agricultural crops in short-turn exchange planting systems and their balance

Options	2003 yr.			2004 yr.			2005 yr.			2002-2005 years . The total amount of nutrients assimilated during, kg/ha			The amount of nutrients left in the soil by the roots and remnants of cereals and legumes, kg/ha.			The amount of fertilizers applied in the care of cereals and legumes, kg/h (2002-2005 years, pure case)			The amount of nutrients returned to the soil, kg/ha.		
	N	P_50_5	K_20	N	P_50_5	K_20	N	P_50_5	K_20	N	P_50_5	K_20	N	P_50_5	K_20	N	P_50_2	K_20	N	P_50_5	K_20
1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	190,9	94,3	248,2	151,7	64,6	169,9	121,5	55,6	137,4	464,1	214,5	555,5	71,8	32,2	41,3	450	225	150	+57,8	+42,7	364,2
3	179,2	91,8	241,4	-	-	-	140,8	69,9	170,5	320,0	161,7	411,9	46,8	21,0	27,0	300	150	100	+26,8	+9,3	284,9
4	170,0	132,7	334,3	83,3	23,8	139,7	195,4	41,4	219,2	448,7	197,9	693,2	181,8	67,2	112,3	390	200	130	+123,1	+69,3	450,9
5	180,1	134,3	332,3	171,3	34,3	189,5	-	-	-	351,4	168,6	521,8	156,1	64,2	111,9	330	165	110	+134,7	+60,6	299,9
6	172,3	133,4	325,7	-	-	-	194,1	40,7	215,0	366,4	174,1	540,7	155,2	64,2	112,8	330	165	110	+118,8	+55,1	317,9

Note: ***In chemical analysis, 100 g of each vegetative organ of all plants. the chemical elements contained in the dried mass were taken into account.***

Also, it was determined that in the autumn, repeated, intermediate and legume-grain crops in the new systems of alternating sowing, when the alfalfa returned to the soil by means of 9-21 tons of nitrogen, 110-270 kg of phosphorus, 45-80 kg of phosphorus, 120-290 kg of potassium substances left in the soil for three years, 155-180 kg of nitrogen. When these scientific results are compared among themselves in terms of the amount of organic residues that plants leave in the soil, it is observed that the amount of organic residues that winter wheat, legumes-grains, repeated and intermediate crops that leave in the soil during a rotation (3 years) is not less than the amount of organic residues that leave in the soil.These scientific results suggest that agricultural crops used in short-turn crop rotation systems of the current new agricultural system also do not lag behind the clover plant in terms of organic residue accumulation in the soil. This will serve to increase the amount of humus in the soil in the future, improve the macro and microstructure of the soil, as well as provide a positive effect on the physical and water-physical properties of the soil.

Economic efficiency of chronic cotton planting of alfalfa-cotton and short-turn of swapping

In our republic, economic entities in the field of agriculture are provided with wide opportunities for the modernization of production, efficient use of land and water resources, further development of production activities of import-substituting and export-oriented products. On the basis of the fulfillment of these tasks, the domestic market is filled with agricultural products, new techniques and technologies are introduced into production, a lot of new jobs are created. In addition to local investments, the scale of attracting foreign investment to the economy will ultimately increase the economic efficiency of agricultural production. And for this, the importance of introducing intensive and resours agrotechnologies, together with the creation of new varieties of agricultural crops that do not require much cost, have a high yield, give a quality product, can not be overestimated. At this time, any new varieties, techniques and agrotechnologies should create economic opportunities that can yield significant results.

The implementation of economic activities in agricultural enterprises on the basis of market demand and the search for ways to effectively solve the established economic tasks begins, first of all, with the qualitative implementation of the achieved results, the economic analysis of the ongoing production processes. Therefore, every leader, specialist, researcher in the field must be able to master the methods and methods of economic analysis well and apply them in their activities. As a result of this, many types of opportunities that are not used in production are identified, it will be possible to evaluate the inadmissible shortcomings, new tokens will be introduced. Economic entities are obliged to organize management in order to increase production efficiency in accordance with the characteristics and requirements of the market. This ensures that the current scientific developments, new varieties, breeds of livestock, agrotechnologies, techniques are available to producers in favorable and acceptable proportions for buys. It provides an economic basis for the functioning and development of the enterprise in terms of the market. Otherwise, the economic entities will be in a state of economic impoverishment without achieving the goal they set before them, they will be able to lose their place in the market.

Therefore, enterprises are unable to carry out their activities without in-depth study of the current state of the market and their internal capabilities or determine ways of future development.

It turns out that each enterprise must continue its activity in the market conditions, first of all analyze in depth all its circumstances and opportunities for the use of scientific innovations, make sure of the economic efficiency of innovations, have appropriate calculations. As a result of the analysis, an activity program based on risk, but at the same time scientifically justified, will be developed, decisions will be made on the use of available resources (techniques, agrotechnologies, seeds, scientific recommendations, etc.) or their replacement with other effective ones. And its validity ensures the correct and effective use of funds. As a result of the analysis, real data is collected and compared with the plan indicators or the best indicators achieved. In this way, new varieties, techniques, technologies are evaluated for the expected effect, the positive or negative cases are determined and the possibilities are considered. Data is also directly linked to the market situation. Changes in the market and their positive or negative impact on the functioning of the enterprise are analyzed quickly. On this basis, appropriate measures are established.

From the foregoing, it becomes clear that in the economic and analytical tool in market conditions, all processes are analyzed by specific facts in an analytical way, they are summarized by synthesis, appropriate decisions are taken and a clear impact on the activity of the enterprise is made.

Of course, economic analysis does not only fulfill the task of studying the real situation in the market conditions and changing it to the positive side. Perhaps, new products, scientific innovations, techniques, technologies, foreign enterprises, organizations, individuals will also be prepared through. With it, a complete picture of the economic effect of a new development, technique, technology is formed.

Economic analysis revealed the need for in-depth study and proper reading of economic and technological data on the improvement of production, the emergence of free competition among enterprises. This, in turn, shows how important economic analysis is in every industry as well.

In this regard, the economic indicators of alfalfa-cotton and short-turn swapping systems, which are now widely used in production, will be analyzed and some questions that remain in the following years and cause controversy in the majority will be found.

Due to the current market economy, the cost of production when the alfalfa is taken care of for 3 years in a single field in the 3:7 (3 years of alfalfa -7 years of cotton) crop system is estimated at the current price of about 3,9-4,0 million amount. Total revenue from sales amounted to 6,9 million sum, while the net income received is 2.9 million sum, profitability is 7.4%. This result is not a worse result than one. Because this annually receives an average of 0.9 million sum for hectares. However, in the conditions of the current market economy, it is known that these figures do not justify themselves, the effective use of irrigated land throughout the year, the employment of lands with agricultural crops as much as possible throughout the year, the increase in economic efficiency by obtaining abundant and qualitative harvest from them is the main factor of increasing the welfare. Therefore, short-turn switching planting systems, which include the effective use of irrigated land, are the most optimal option in the implementation of the above points.

According to the data obtained from the economic indicators of the short-turn crop rotation experiment presented in (table 15) of this book, the total revenue from the sale of products in the options grown in chronic cotton and autumn was determined to be 7182000 and 6540300 sum/ha in 3 years, respectively, while production costs were 7350000 and 4950000 sum/ha. In the case of economic damage from cotton production to 769800 sum/ha, in the first option of which permanent cotton was grown, in the second option chronic winter wheat net income of 1590300 sum/ha was obtained. Economic indicators close to this are the third in the experiment, 1:1:1, winter wheat: cotton: in the winter wheat system, also observed, the net profit is 1215500 sum/ha made up.

It is noteworthy that in the fourth, fifth and sixth options of the experiment, economic indicators showed a very high result. In the fourth option of the experiment (1:1:1, winter wheat+repeated crop-beans+intermediate crop-triticale: cotton +intermediate crop-triticale: bean) the cost of production for 3 years is 7400000 sum/ha. made up. This is almost equal to the cost (up to 7350000 sum/ha) spent for 3 years in the chronic control option of the experiment. The fact that the total profit from sales was almost two as high (16417550 sum/ha), while the net profit was 9017550 sum/ha it was determined that he founded. Similar records were also observed in the fifth (1:1:1, winter wheat+repeated crop-beans+intermediate crop-triticale:bean:cotton) and sixth (1:1:1, winter wheat+repeated crop-beans:cotton+intermediate crop-triticale: bean) option of the experiment.

Now we will do a comparative analysis of the economic indicators obtained from the systems of alfalfa-cotton (3:7) and short-turn crop (1:1:1) for 3 years.

As already mentioned above, the cost of production when alfalfa is grown in the system of crop rotation (3:7) for 3 years in alfalfa is up to 3950000 sum/ha. was founded. The fourth of short-turn crop rotation (1:1:1, winter wheat+repeated crop-

Table 13

Economic effect of chronic cotton and alfalfa-cotton rotation
(Scientific research institute of agrotechnologies of seeds and cultivation, 2005-2014 yrs.10-rotation)

№	Economic indicators	Under plowing every year 30 t/ha. manure	NPK 250:175:125 kg/ha	Control (without fertilizer)	NPK 150:100:50 kg/ha	3:7, alfalfa-cotton rotation in maintenance alfalfa after cotton NPK 150:100:50 kg/ha.						
						1st year	2nd year	3rd year	4th year	5th year	6th year	7th year
1	Productivity t/ha	2.78	3.32	0.88	2.7	2.36	2.05	3.18	4.2	3.87	3.51	3.53
2	Additional yield, t/ha	1.9	2.44	-	1.82	1.48	1.17	2.3	3.32	2.99	2.63	2.65
3	Income from sales sum/ha	2627100	3137400	831600	2551500	2230200	1937250	3005100	3969000	3657150	3316950	3335850
4	Productions costs, sum/ha	2200000	2760000	1700000	2540000	2600000	2600000	2600000	2600000	2600000	2600000	2600000
5	Net profit sum/ha	427100	377400	-868400	11500	-370000	-662750	405100	136900	1057150	716950	735850
6	Profitability degree, %	19,4	13,6	-	0,04	-	-	15,5	52,6	40,6	27,5	28,3

Table 14

Economic efficiency in short-turn crop rotation

(Scientific research institute of cotton selection, seed growing and agrotechnologies)

№	Economic indicators	Control (1-opt)			Control (2- opt)			1:1:1 (3- opt)			1:1:1 (4- opt)					
		Cotton	Cotton	Cotton	Winter wheat	Winter wheat	Winter wheat	Winter wheat	Cotton	Winter wheat	Winter wheat	Winter wheat	Intermedite crop tritikale	Cotton	Intermedite crop tritikale	Soy bean
1	Productivity, t/ha	2.62	2.62	2.36	6.31	5.82	4.64	6.37	2.82	5.17	6.23	1.83	28	3.2	30.7	3.77
2	Additional yield, t/ha	-	-	-	-	-	-	-	0.2	0.5	-	-	-	0.6	-	-
3	Gross profit from sales, sum/ha	2475900	2475900	2230200	2460900	2269800	1809600	2484300	2664900	2016300	2429700	4980000	1402000	3052350	1537500	3016000
4	Productions costs, sum/ha	2650000	2650000	2650000	1650000	1650000	1650000	1650000	2650000	1650000	1650000	5100000	570000	2650000	570000	1450000
5	Net profit sum/ha	-175000	-175000	- 419800	810900	619800	159600	834300	14900	366300	779700	4470000	832000	402350	967500	1566000
6	Profitability degree, %	-	-	-	49,1	37,5	9,6	50,5	0,5	22,2	47,2	876,2	145,9	15,1	169,7	108,0

read more

№	Economic indicators	1:1:1 (5-opt)					1:1:1 (6-opt)					Total indicators obtained during for three years					
		Winter wheat	Repeated crop (soy bean)	Intermedite crop tritikale	Soy bean	Cotton	Winter wheat	Repeated crop (soy bean)	Cotton	Intermedite crop tritikale	Soy bean	Experience options					
												1	2	3	4	5	6
1	Productivity, t/ha	6.35	1.79	26.47	3.27	3.49	6.25	1.74	3.12	28.13	3.8	-	-	-	-	-	-
2	Additional yield t/ha	-	-	-	-	1.13	-	-	0.5	-	-	-	-	-	-	-	-
3	Gross profit from sales, sum/ha	2476500	5370000	1323500	2616000	3298050	2437500	5220000	2948400	1406500	3040000	7182000	6540300	7165500	16417550	15084050	15052400
4	Productions costs, sum/ha	1650000	510000	570000	1450000	2650000	1650000	510000	2650000	570000	1450000	7350000	4950000	5950000	7400000	6830000	6830000
5	Net profit , sum/ha	826500	4860000	753500	1166000	648050	787500	4710000	298400	836500	1590000	-769800	1590300	1215500	9017550	8254050	8222400
6	Profitability degree, %	50,0	952,0	132,0	80,4	24,4	47,7	923,5	11,2	146,7	109,6	-	32,1	20,4	121,8	120,8	120,3

Table 15

Economic indicators obtained for 3 years from various agricultural crops in the alfalfa and short-turn crop rotation systems in the alfalfa-cotton planting system

Comparative analysis

№	Economic indicators	Economic indicators obtained for three years						Cost-effectiveness obtained in alfalfa for three years				Economic performance of products grown in short-croprotation systems for 3 years,economic indicators obtained alfalfa for 3 years					
		Experience options															
		control (1-opt)	control (2- opt)	1:1:1 (3- opt)	1:1:1 (4- opt)	1:1:1 (5- opt)	1:1:1 (6- opt)	1-year	2-year	3-year	Total 3 in year	control (1- opt)	control (2- opt)	1:1:1 (3- opt)	1:1:1 (4- opt)	1:1:1 (5- opt)	1:1:1 (6- opt)
1	Productivity t/ha	-	-	-	-	-	-	25/13	31.75	29.47	86.35	-	-	-	-	-	-
2	Additional yield, t/ha (from cotton)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Gross profit from sales, sum/ha	7182000	6540300	7165500	16417550	15084050	15052400	2010400	2540000	2357600	6908000	274000	-367700	257500	9509550	8176050	8144400
4	Productions costs sum/ha	7350000	4950000	5950000	7400000	6830000	6830000	1850000	1050000	1050000	3950000	3400000	1000000	2000000	3450000	2880000	2880000
5	Net profit sum/ha	-769800	1590300	1215500	9017550	8254050	8222400	160400	1490000	1307600	2958000	-2188200	-136700	-1742500	6059550	5296050	5264400
6	Profitability degree, %	–	32,1	20,4	121,8	120,8	120,8	0,8	14,1	12,4	7,4	–	–	–	175,6	183,8	182,8

beans+intermediate crop-triticale:cotton +intermediate crop-triticale: bean), fifth (1:1:1, winter wheat+repeated crop-beans+intermediate crop-triticale:bean:cotton) and sixth (1:1:1, winter wheat+repeated crop-beans:cotton+intermediate crop-triticale: bean) ,in the options it was observed that these indicators corresponded to 3450000, 2880000, 2880000 sum/ha. It can be seen that in these options, we can see that the cost of production is less than from 500000 sum/ha to 1000000 sum/ha from the production costs (3950000 sum/ha) when alfalfa is grown for 3 years in the system of crop rotation of alfalfa-cotton (3:7). The total income received for 3 years in the system of crop rotation of the alfalfa-cotton (3: 7) to 6908000 sum/ha, net profit 2958000 sum/ha, these indicators are respectively 9509550; 6059550 (option 4), 8176050; 5296050 (option 5) and 8144400; 5264400 (option 6) sum/ ha in short-turn crop systems (1:1:1) made up.

From the results obtained, it can be concluded that when using short-turn crop rotation systems in production conditions, the cost of production will be from 13% to 27% less than the costs incurred for the cultivation of alfalfa-cotton (3:7) crop rotation system for 3 years. And the resulting net income will be from 45% to 50% higher (table 15). Therefore, in the current conditions, both in terms of increasing soil fertility, and in terms of obtaining high economic income per hectare, our farmers it is recommended to use short-turn switching sowing systems on the basis of grain and is widely introduced in production.

In general, the application of short-turn switching planting systems in the current new agricultural system is evidence of the fact that almost all the agricultural systems before this have been scientifically, practically, economically demonstrating their advantages, as well as at the same time, the agricultural sector in the Republic is suddenly moving along a clear and straight path.

CHARTER IV.

THE EFFECTIVENESS OF SHORT-TURN FARMING OF AGRICULTURAL CROPS IN THE NEW AGRICULTURAL SYSTEM

Agrophysical and agrochemical properties of soil in short-turn crop fields

The bulk mass of the soil is of great importance for the normative growing development of the plant. According to S.N.Ryzhov (1955), in soils with good granularity, the yield is high until the bulk mass is optimal. P.U.Baxtin (1969), , I.Mokarets (1970), D.I.Burov, E.V.Dudinsov believes that as a result of agrotechnical measures and soil treatment, the bulk mass of the soil can increase. In the optimal volume of soil mass, the plant grows well, creates a favorable opportunity for high yields. Because, the bulk mass of the soil alternatives the agrophysical, hydrothermic, aeration, microbiology and finally nutrient regime of the soil.

In the previous sections of this book, The essence of clover crop rotation systems for increasing soil fertility, the analysis of data from numerous studies were touched upon. In the following sections, detailed information will be given about the role and essence of short-turn crop systems in maintaining and increasing soil fertility.

According to the results of the research conducted on crop rotation systems in the field of cotton, it was determined that crop rotation had a positive effect on the agrophysical properties of the soil.

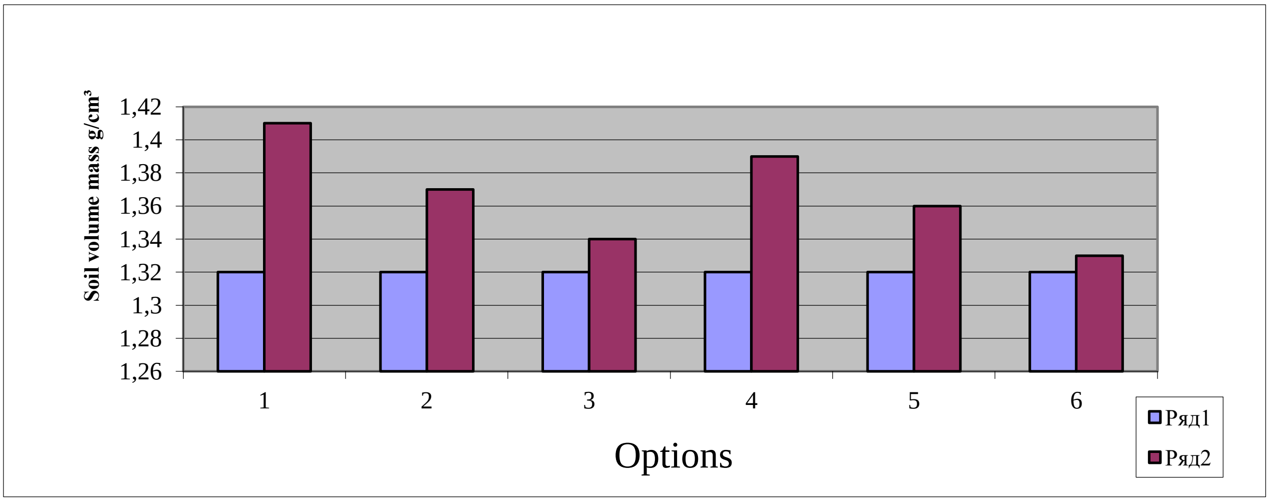
When sowing cotton-grain exchanges, positive changes were observed in the bulk mass of the soil during the exchange of cotton, winter wheat and repeated crops. In the field where the study was conducted, the initial bulk mass of the soil was 0-30 sm in a layer of 1,32 g/sm³.

It was found that in winter wheat planting options, these indicators increased less (0,02 g/sm³), if the planting of the seed increased the volume mass by 0,05-0,3 g/sm³ at the end of its validity period than in the initial figure.

At the beginning of the period of validity of the last year of the study, the buds of the 1:1 system of crop rotation before planting cotton: winter wheat + repeated crop (beans): cotton and cotton: winter wheat + repeated crop+intermediate crop:if the bulk mass of the soil in the cotton is close to the initial indicators of the effect of repeated and intermediate crops, 2:1 system of crop rotation winter wheat+ repeated crop (beans): winter wheat+repeated crop (beans):cotton and winter wheat+repeated crop (beans): winter wheat+repeated crop (beans)+intermediate crop:these indicators decreased to 0.01-0.02 g/sm³ compared to the link of cotton. It can be seen that in autumn wheat and after repeated sowing and sowing of intermediate crops in 1:1, 2:1 exchange systems slightly alternate the volume of soil mass, in most cases, its reduction was observed (drawing 3). Similar legalities were also noted in the second research work on crop rotation.

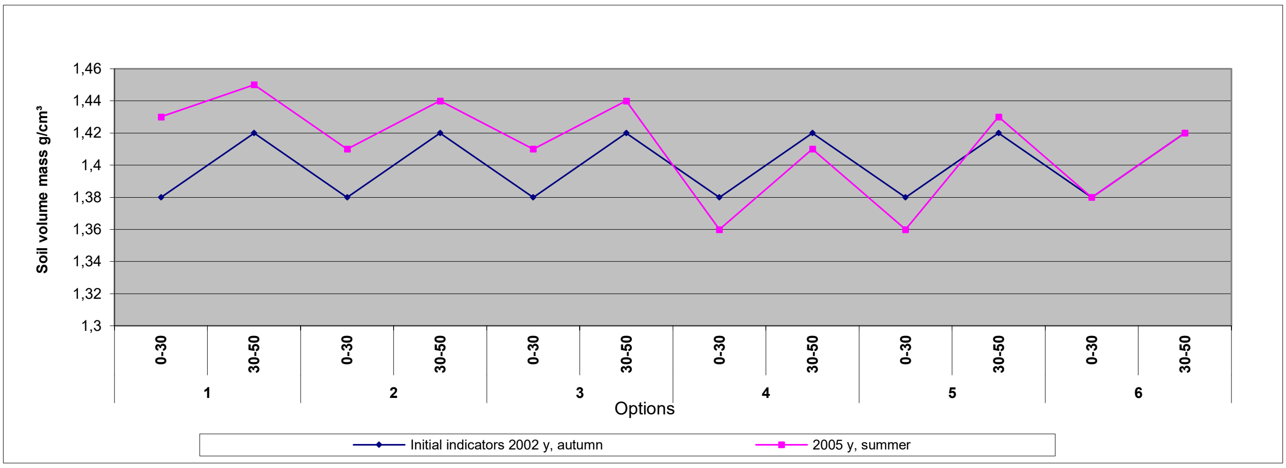
Another of the agrophysical properties of the soil is its water permeability. According to the results of the study, it was observed that the water permeability of the soil also depends on its bulk mass. If in the first year of the study, the water permeability was 3 hours is 533 m³/ha in total, in the last year of the study, this indicator was 285-314 m³/ha in terms of options. And this means that the water permeability of the soil decreased by 40-45% compared to the initial indicator, that is, the experiment 1:1:1 (4,5,6-opt) winter wheat + repeated crop (beans) + intermediate crop (triticale) : cotton + intermediate crop (triticale) : bean, winter wheat + repeated crop (beans) + intermediate crop (triticale) : bean: cotton, winter wheat + repeated crop (beans) : cotton + intermediate crop (triticale): bean we can observe that repeated cultivation of leguminous grain crops in option has a positive effect on soil water permeability. Although, the control, which was not sown repeatedly after the fall 2-nd option and 1:1, winter wheat:cotton:in the winter wheat grown 3-th option, the water permeability was slightly higher, nevertheless, in the case of repeated sown options, this indicator was differentiated by the fact that the cotton-plant transferred more water to 40-45 m³/ha compared to the control. In the non-repeated crop option, the soil's water permeability decreased by 51-53%, in the 6-th option by 40%, in the 4-th, 5-th option also by 11-12% compared.Repeated and intermediate crops, as well as the latest effects of bean planting as the main grain-leguminous crop, were evident at the end of the period of validity of the last year of the study. According to the data, in the 4, 5 and 6 options of the experiment, the water permeability of the soil was 509-480-466 m³/ha, respectively (table 16).

Another of the agrophysical properties of the soil is its porosity. If the porosity of the soil is high, the air exchange is improved, the passage of microbiological processes is accelerated, the heat procedures change to the positive side, as a result, certain conditions are created for the soil to become fertile.



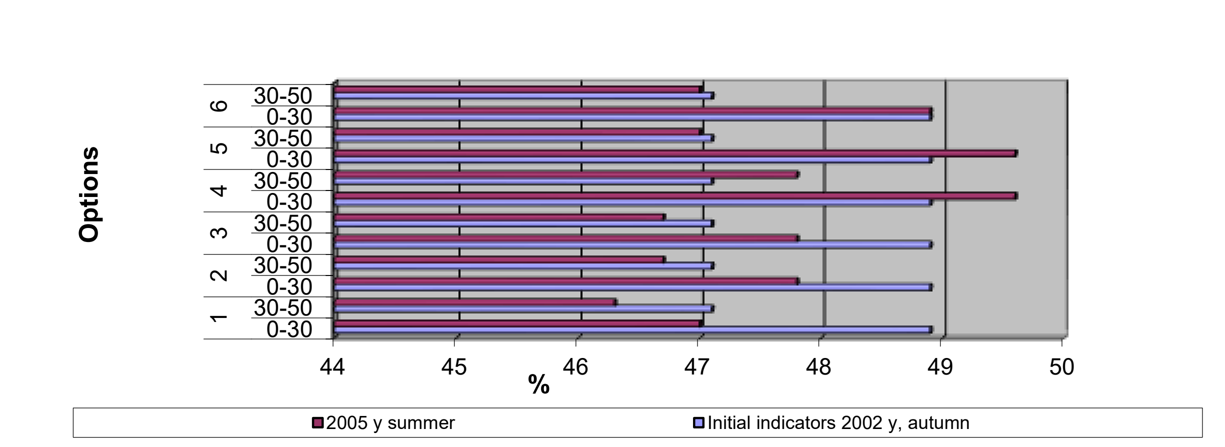
2-drawing. Effect of short-turn crop rotation systems on soil volume mass, g/sm³

1-option 1:1 (cotton: winter wheat : cotton) 2-option 1:1 (cotton: winter wheat+ repeated beans : cotton), 3-option 1:1 (cotton: winter wheat + repeated beans + intermediate crops-rye : cotton), 4-option 2:1 (cotton: cotton + intermediate crops : winter wheat + repeated beans), 5-option 2:1 (winter wheat+ repeated beans : winter wheat+ repeated beans: cotton) , 6-option 2:1 (winter wheat+ repeated beans: winter wheat+repeated beans + intermediate crops-rye : cotton)



3-drawing. Effect of short-turn crop rotation systems on soil volume mass, g/sm³

1-option cotton (control), 2-option, winter wheat (control), 3-option 1:1 (winter wheat : cotton: winter wheat), 4-option 1:1:1 (winter wheat + repeated beans + intermediate crops -triticale : cotton + intermediate crops-triticale : bean), 5-option 1:1:1 (winter wheat + repeated beans + intermediate crops-triticale : bean: cotton), 6-option 1:1:1 (winter wheat + repeated beans: cotton + intermediate crops-triticale : bean)



4-drawing. The effect of short-turn switching planting systems on soil porosity, %

1-option cotton (control), 2-option, winter wheat (control), 3-option 1:1 (winter wheat : cotton: winter wheat,), 4-option 1:1:1 (winter wheat + repeated beans + intermediate crops -triticale : cotton + intermediate crops-triticale : bean), 5-option 1:1:1 (winter wheat + repeated beans + intermediate crops-triticale : bean: cotton), 6-option 1:1:1 (winter wheat + repeated beans: cotton + intermediate crops-triticale : bean)

The above legality was also observed in the data obtained from the study under the conditions of typical gray soils. It should be noted that crop rotation 1:1:1, winter wheat+repeated crop (beans)+intermediate crop (triticale): cotton +intermediate crop:bean, 1:1:1, winter wheat+repeated crop (beans) +intermediate crop (triticale) : soy, 1:1:1, winter wheat+repeated crop (beans): cotton +intermediate crop (triticale): repeated grain-leguminous crop (beans in systems such as bean, intermediate crops (triticale), and mainly grain-leguminous crop (triticale) soil appropriate level of porosity 49,6-49,6-48,9% provided. This indicates that the porosity level of this soil is improved by 0,7% compared to the initial indicators.

The above legislation was also observed in the results of the experiment on the soil conditions of the northern and southern regions of the Republic on the agrophysical properties of the soil. The initial indicator of the bulk mass of the soil in the 0-30 sm layer of the soils of the Kashkadarya region was 1.39 g/sm³, it was observed that the bulk mass of the soil did not change significantly at the end of the growing season of repeated crops. The indicators were 1,38-1,39 g/sm³ in terms of options. In the 1-th option of the sow herd, this indicator increased by 0,04 g/sm³ compared to the stalk. According to the data of the last year of the experiment, it was observed that the beans, which was planted as a repeated grain crop after the fall, then the intermediate crop (triticale) and the bean planted as the main crop had a positive effect on the bulk mass of the soil. Planting this alternation 1:1:1 (4, 5, 6-opt) winter wheat + repeated crop (beans) + intermediate crop (triticale) : cotton + intermediate crop (triticale): bean, winter wheat + repeated crop (beans) + intermediate crop (triticale) : bean: cotton, winter wheat + repeated crop (beans) : cotton + intermediate crop (triticale) : from the initial amount of soil bulk mass in bean link to 0,02-0,004 g/sm³ it was observed that it improved, that is, these indicators correspondingly 1,35-1,37-1,36 g/sm³ made up.

Apparently, as a result of the high temperature and the activity of microorganisms in the soil under the appropriate conditions, the decomposition of root and angular residues left by repeated and intermediate crops in the soil, that is, the presence of organic compounds, positively affected the agrophysical properties of the soil.

These legislations were also observed in the data obtained on other agrophysical properties of the soil, water permeability, porosity.

Experience in Khorezm region compared to the results, repeated introduction of soybeans as intermediate crops and main crops into the crop rotation systems ensured improvement of soil agrophysical properties. As can be seen from the data, 1:1, 1:1:1, 2:1 the system of seeding as cotton, winter wheat, cotton, winter wheat : cotton: bean, winter wheat : winter wheat : cotton: cotton:cotton : crop like wheat in winter wheat and grain legume crops as repeated after him link, space after cotton crops year-round, for the purpose of efficient use from the space from the ground even after repeated crops, grain legume crops as a main crop or the soil has a positive effect on the texture of the transplanting stand agrophysical alternative them. As a result of their recent impact, the growth of porcine and winter wheat has a positive impact on its development, increasing productivity. The fact that the ecological environment in the fertile layer of the soil is clean and healthy not only determines the yield of agricultural crops, but also has a positive impact on its quality. The formation of a fertile fold in the soil is a process that takes a long time. The basis of the fertile layer is humus. And humus is in the organic part of the soil, which is formed as a result of biochemical changes in the remains of plant and animal organisms. The organic substance in the soil changes during the decay process. The quantity and quality of humus determines the fertility, strength, as well as positive and negative properties of the soil. The more humus, the more fertile the soil is, the better its physical, chemical and biological properties. We will analyze this on the basis of the data of the experience conducted in the field of chronic swaddling and swaddling of alfalfa and alfalfa, which has been conducted for many years at the Scientific-Research Institute of agrotechnologies of cotton selection, fertilization and cultivation.

Data obtained on the effect of agrochemical properties of soil on the support of chronic local and mineral fertilizers in a field of porous and 3:7 alfalfa-cotton planting system are presented in table 17.

Alfalfa by the data obtained, the 9-rotation of the experiment (1995-1997 y)in the 5-th option as a result of growing the quail for 3 years, the amount of humus in the soil amounted to 0-30 sm in the layer of 1,013 %, and in the layer of 30-50 sm in the layer of 0,878 %. It was observed that the total nitrogen content was 0,104%, phosphorus was 0,217%, potassium was 2,24%. At the end of this rotation (9-rotation, 1998-2004 y. according to the data obtained (the end of the 7-year validity period of the cotton), the amount of humus (in the layer of 0-30 sm) decreased by 0,834% (in alfalfa with the result before planting the 1-th year of the cotton after the quail decreased by 0,179%), nitrogen content decreased by 0,070% (decreased by 0,034 %),10-rotation(2008-2014 y.) the same legislation is observed and the amount of humus in it (2005-2007 y. in comparison) it was observed that the nitrogen content was 0,840 % (decreased to 0,070%), nitrogen content was 0,071% (decreased to 0,020%). We can observe that the amount of humus in the 1st option, where 30 t/ha is applied annually in the care of the cotton, has practically not changed in the next 20 years (in 2014 the indicator was compared to the indicator in 1995 year) (0.845%-0.836%), in the 2-nd option where the norm of mineral fertilizer NPK 250:175:125 kg/ha,that we cfn observed 3-rd is 0.087% .It was also found that the nitrogen content decreased by 0,009 %; 0,010%; 0,013% in accordance with the above options.

Table 16

Effect of short-turn crop rotation on soil water permeability, m^3/ha

Options	2002 yr, autumn				2003 yr, autumn				2005 yr, spring				2005 yr, autumn			
	1-hour	2- hour	3- hour	Total	1- hour	2- hour	3- hour	Total	1- hour	2- hour	3- hour	Total	1- hour	2- hour	3- hour	Total
1	315	130	88	533	140	109	95	344	295	190	71	556	188	95	51	344
2	315	130	88	533	210	134	107	451	-	-	-	-	208	113	40	361
3	315	130	88	533	197	125	100	422	-	-	-	-	199	101	32	372
4	315	130	88	533	175	123	82	350	285	148	94	527	231	180	108	509
5	315	130	88	533	164	126	84	374	322	165	126	613	234	157	89	480
6	315	130	88	533	172	114	97	383	274	167	68	509	216	141	107	466

It can be seen that cotton-alfalfa in 3:7 crop rotation systems, although soil fertility is in the normative state in 1-2 years after fertilization, it is observed that it decreases alfalfa in 3-7 years after fertilization. This in itself dictates the provision of additional mineral fertilizers for higher yields in the care of the cotton. This situation does not coincide with the current new system of farming and does not yield economic benefits. It is worth noting that even if a sufficient number of local and mineral fertilizers are used in the care of the soil, the fertility of the soil (humus, nitrogen) will significantly decrease over the years if the soil is not planted alternately with other crops. This leads to a sharp decrease in the yield of the cotton, as well as a decrease in the quality of the fiber. Therefore, the observance of their scientific exchange in the cultivation of agricultural crops will serve to preserve, increase soil fertility in the future and ensure high and high-quality harvest from them. Sufficient data were also obtained on the agrochemical changes in the soil in the experiments conducted on the exchange of crops in the cotton complex. According to the research data on the conditions of typical gray soils, the initial amount of humus was 0,910% in the soil tillage layer, nitrogen content 0,055%, phosphorus 0,133%, potassium content 1,81%. It was found that the amount of humus in the cotton options (1, 2, 3, 4-opt) decreased by 0,025-0,060% compared to the initial amount, nitrogen by 0,005-0,013%, phosphorus by 0,004-0,014% (table 17). But there was an increase in humus and nitrogen in 5-and 6-options, which were planted in beans and winter wheat then as a repeated crop. In these options, the amount of humus increased by 0,020-0,021%, while nitrogen by 0,007-0,010%. Set 1:1 system of planting cotton: winter wheat+repeated crops (beans) : cotton and cotton:winter wheat+repeated crops (beans)+field crops(rye) : link in cotton and winter wheat crops in the fall after transplanting as a result of repeated experience of intermediate 2 and 3-option of the initial amount of nitrogen in humus and keep the rest if (0,888% and 0,905%-humus and 0,065% and 0,055%-nitrogen) experience in 2:1 planting of winter wheat system crop + repeated crops (beans) : winter wheat + repeated crops (beans) : cotton and winter wheat + repeated crops (beans) : it was noted that the amount of humus increased by 0,045% -0,048%, nitrogen by 0,030%, while in cotton link(5, 6-opt):

winter wheat + repeated crop (beans) + intermediate crop (rye). It was observed that the last year of the study had a positive impact on the growth, development and productivity of the planted cotton according to the established system. In the 2:1 system of crop rotation, it was found that when the cotton +intermediate crop (rye) : the cotton;winter wheat+repeated crop (beans) was sown for two years in a row, it was found that the humus in the soil decreased by 0,035% compared to the stalk and nitrogen by 0,009%. In the last year of the study, winter wheat to this option and then planted beans as a repeated crop kept the fertility balance of the soil slightly compared to the control option. Similar legislation on agrochemical properties of soil was observed in another study. In this field, the initial amount of humus was 0,819%, nitrogen 0,097%, phosphorus 0,108%, while the active forms of the nutrient elements were nitrate nitrogen 6,9 mg/kg, phosphorus 43,2 mg/kg, potassium 220 mg/kg of exchange. Crop planting 1:1:1 (4, 5, 6-opt) winter wheat + repeated crops (beans) + field crops (triticale) : cotton + intermediate crops (triticale) : bean, winter wheat + repeated crops (beans) + field crops (triticale) : bean : cotton, winter wheat + repeated crops (beans) : cotton + intermediate crops (triticale) : humus and nitrogen when planting winter wheat crops in the bean link repeated after their own initial amount (0,819% and 0,097%) were observed 0,826 %-0,820%-0,818% (humus) and 0,094%-0,099%-0,093% (nitrogen). (Table 18). In the 4th option of the study, as a result of the sowing of intermediate crops after repeated sowing, in the second year of the study, in this option, the planting of husks was also not able to cause a decrease in the amount of humus and nitrogen in the soil (0,818% and 0,080%). And bean for the 5-th option of the experiment increased the amount of humus by 0,009% compared to preliminary and nitrogen by 0,007%. In the experiment, it was found that the number of humus in the plant option decreased by 0,029%, nitrogen by 0,019%, and in the autumn planting option by 0,015%, nitrogen by 0,012%.

According to the data obtained in the last year of the study, the highest index on humus and nitrogen was 4-option of the experiment, winter wheat + repeated crop (beans) + intermediate crop (triticale) : humus + intermediate crop (triticale) : observed in the bean, the amount of humus was 0,843%, nitrogen was 0,100%.

This means, respectively, 0,024% and 0,013% more than the initial amount. Also, 5 of the experiment, winter wheat + repeated crop (beans) + intermediate crop (triticale) : bean: cotton and 6th winter wheat + repeated crop (beans) : cotton + intermediate crop (triticale) : there was also a positive case in the bean options, when the amount of humus increased by 0,008-0,012% on the options, while the nitrogen content remained the initial indicator in the 5th option (0,097%), in the 6th option by there was an increase. In the control options of the study, that is, the amount of humus in the sow option decreased by 0,044% (for three years), nitrogen by 0,032%, and in the autumn planting option by 0,029% -02027% respectively.

Based on the above information,it can be concluded that the cultivation of grain-bearing crops as a repeated crop after the fall in various link of the cotton-winter wheat crop systems preserves the balance of humus and nitrogen in the soil in some cases increases it.

Table 17

On the fields of chronic cotton and alfalfa-cotton dynamics of changes in nutrients in soil, %
(Former Uzbekistan Cotton Research Institute, current cotton Selection, Research Institute of agrotechnologies of seeds and cultivation, typical gray soil)

Options	Soil layers, sm	1995-2000 yrs.				2000-2005 yrs.				2005-2010 yrs.				2010-2014 yrs.			
		Humus	N	P	K	Humus	N	P	K	Humus	N	P	K	Humus	N	P	K
1	0-30	0,812	0,072	0,178	2,19	0,779	0,082	0,17	2,16	0,845	0,085	0,123	2,23	0,836	0,076	0,117	2,78
	30-50	0,655	0,054	0,160	1,63	0,628	0,072	0,16	1,37	0,805	0,073	0,108	1,45	0,817	0,065	0,107	1,45
2	0-30	0,657	0,087	0,190	2,18	0,660	0,089	0,18	2,18	0,891	0,093	0,130	2,11	0,923	0,083	0,121	2,56
	30-50	0,560	0,057	0,154	1,44	0,562	0,077	0,16	1,40	0,758	0,079	0,108	1,56	0,838	0,070	0,111	1,65
3	0-30	0,543	0,051	0,120	2,01	0,477	0,065	0,13	1,95	0,720	0,068	0,091	2,24	0,633	0,055	0,079	1,78
	30-50	0,466	0,038	0,107	1,12	0,425	0,057	0,12	1,11	0,644	0,056	0,080	1,45	0,486	0,043	0,070	1,42
4	0-30	0,652	0,068	0,173	2,16	0,653	0,082	0,17	2,13	0,844	0,078	0,114	2,22	0,894	0,074	0,110	2,45
	30-50	0,542	0,051	0,150	1,49	0,576	0,072	0,16	1,32	0,749	0,068	0,100	1,67	0,849	0,063	0,097	1,68
		1995-1997 yrs. (3 year alfalfa)				1998-2004 yrs. (7 year cotton)				2005-2007 yrs. (3 year alfalfa)				2008-2014 yrs. (7 year cotton)			
		Humus	N	P	K	Humus	N	P	K	Humus	N	P	K	Humus	N	P	K
5	0-30	1,013	0,104	0,217	2,24	0,834	0,070	0,17	2,0	0,910	0,091	0,150	2,56	0,840	0,071	0,124	2,00
	30-50	0,878	0,094	0,197	1,53	0,781	0,080	0,13	1,3	0,829	0,077	0,129	1,78	0,796	0,063	0,105	1,57

As a result of repeated sowing of cereals (beans), intermediate crops (triticale), after repeated and repeated cultivation of cereals (beans), bean as the main crop, the amount of humus in the soil increases by 0,008% -02024%, nitrogen by 0,011% -0,013%.

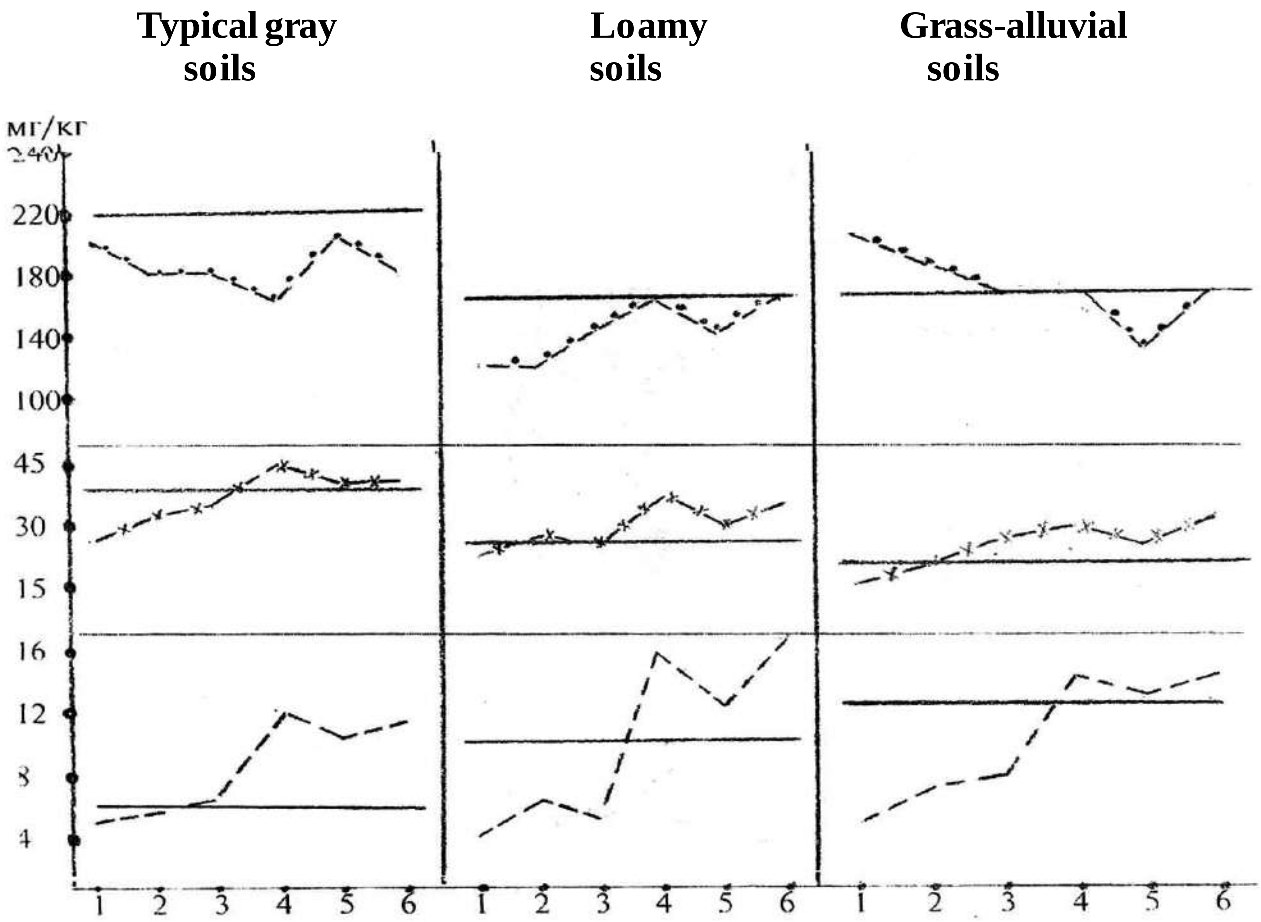
It is known that the meadow-alluvial soils of the Khorezm region are very poorly supplied with humus and other nutrients.

According to the data, the field soil from which the study was conducted is 0-30 sm. in the layer, the amount of humus was 0,544%, nitrogen 0,060%. Seeding 1:1:1, winter wheat+repeated crops (beans)+intermediate crops (triticale) : cotton + intermediate crops (triticale): bean, (4-opt), winter wheat+repeated crops (beans)+ intermediate crops (triticale): bean: cotton (5-opt), winter wheat+repeated crops (beans) :cotton + intermediate crops (triticale): bean (6-opt) option after the winter wheat of the cereal-legume crops-transplanting of humus accordingly, if the amount of 0,005%-0,002%-0,006% increase if it were to save the initial amount of nitrogen, until the end of the experiment, it was found that the amount of humus and nitrogen in these options did not decrease sharply from the initial amount. The results obtained in the last year of the study revealed the agrochemical properties of the soil in the conditions of the Khorezm meadow-alluvial soils. Crop rotation 1:1:1, winter wheat+repeated crop (beans)+intermediate crop (triticale) : cotton +intermediate crop (triticale) : bean, (4-opt), winter wheat+repeated crop (beans)+intermediate crop (triticale) :bean:cotton (5-opt), winter wheat+repeated crop (beans) : cotton +intermediate crop (triticale) : bean (6-opt) in its options, it was observed that the amount of humus increased by 0,008% -0,015%, respectively, compared to the initial indicators, maintaining the initial amount of nitrogen, as a result of repeated grain crop, intermediate crop and bean planting as the main crop after the fall.

Nearly such legalities were observed in the study conducted in the conditions of barren soils of Kashkadarya region. Only in these conditions it was found that the decrease and increase in the amount of nutrients in the soil occurred at an accelerated rate.According to the data obtained, the initial amount of humus in barren soils was 0,922%, nitrogen 0,065%, phosphorus 0,237%. As determined in the research options, after the winter wheat, the amount of humus as a result of repeated grain-leguminous cultivation is increased by 1:1:1, winter wheat+repeated crop (beans)+intermediate crop (triticale) : cotton+intermediate crop (triticale) :bean (4-opt), winter wheat+repeated crop (beans)+intermediate crop (triticale) : bean (5-opt), winter wheat+repeated crop (beans)+intermediate crop (triticale): bean (5-opt), winter wheat + repeated crop (beans): cotton + intermediate crop (triticale): bean (6-opt) options the initial amount of nitrogen was retained if increased by 0,009% -0,005% respectively.

As for the data obtained at the end of the validity period of the last year of the study, as determined in the systems of crop rotation, the introduction of bean into the cotton-grain link, and after repeated sowing of grain after the fall, as a result of the sowing of intermediate crops, the amount of humus in the soil increased by based on 4,5,6-options of 0.033%-0.028%-0.022%, the amount nitrogen 4-option the increased of 0.010%,so 5 and 6-options the initial amount remained.

The above information, it can be concluded that in the short-turn exchange of agricultural crops, repeated cultivation of cereals, intermediate crops and the introduction of bean as the main crop into an exchange sowing system, in many cases, alternatives are made to the amount of humus and nitrogen in the soil, and with the passage of years and their return.This positive process is intensified in the southern territory of the Republic-bald soils, the central territory is moderate in typical grizzly soils, and the northern territory is slow in the conditions of meadow-alluvial soils.



5-drawing.The effect of short-turn switching planting systems on the mobility of nutrients in the soil (at the end of the validity period)

Note*:* - - - - - - *nitrogen,* -x-x-x-x-x-x--*motion phosphor,* -.-.-.-.-.-.-.*replaceable potassium,* _____ *initial amount*

1-option cotton (control), 2-option, winter wheat (control), 3-option 1:1 (winter wheat : cotton: winter wheat), 4-option 1:1:1 (winter wheat + repeated beans + intermediate crops - triticale : cotton + intermediate crops-triticale : bean), 5-option 1:1:1 (winter wheat + repeated beans + intermediate crops-triticale : soy bean: cotton), 6-option 1:1:1 (winter wheat + repeated beans: cotton + intermediate crops-triticale :soy bean)

Table 18

Effects of short-turn crop rotation systems on the amount of nutrients in typical grizzly soils

Options	Soil layers, sm.	General form, %			Moving form, mg/kg		
		Humus	N	P	$N\text{-}NO_3$	P_2O_5	K_2O
Initial indicators, 2002 yr, autumn							
	0-30	0,819	0,097	0,108	6,9	43,2	220
	30-50	0,785	0,090	0,096	6,4	29,0	200
2003 yr, summer							
1	0-30 30-50	- -	- -	- -	- -	- -	- -
2	0-30 30-50	0,780 0,663	0,059 0,055	0,092 0,084	4,9 3,6	41,2 29,0	170 150
3	0-30 30-50	0,794 0,741	0,073 0,062	0,096 0,088	5,1 3,8	42,1 28,7	170 150
4	0-30 30-50	0,781 0,720	0,048 0,045	0,092 0,084	4,8 3,2	41,0 28,1	170 150
5	0-30 30-50	0,775 0,719	0,062 0,048	0,092 0,084	4,9 3,3	41,7 28,8	170 150
6	0-30 30-50	0,786 0,760	0,057 0,049	0,094 0,087	5,2 3,8	42,0 28,3	170 150
2003 yr, autumn							
1	0-30 30-50	0,800 0,760	0,089 0,082	0,097 0,087	2,8 1,0	29,7 27,0	160 140
2	0-30 30-50	0,808 0,761	0,090 0,085	0,101 0,084	4,5 3,5	40,9 28,8	170 140
3	0-30 30-50	0,805 0,750	0,083 0,080	0,104 0,087	4,7 3,5	41,0 28,5	170 140
4	0-30 30-50	0,826 0,780	0,094 0,080	0,105 0,091	5,3 1,4	37,8 26,5	150 120
5	0-30 30-50	0,820 0,780	0,099 0,089	0,100 0,088	6,9 3,7	38,1 26,1	150 120
6	0-30 30-50	0,818 0,762	0,093 0,083	0,100 0,085	5,6 1,0	38,7 25,7	150 120

2004 yr, spring

1	0-30	0,805	0,091	0,110	3,7	27,2	220
	30-50	0,760	0,080	0,090	3,0	25,0	200
2	0-30	-	-	-	-	-	-
	30-50	-	-	-	-	-	-
3	0-30	0,810	0,080	0,110	3,7	40,8	200
	30-50	0,760	0,067	0,095	3,7	30,0	200
4	0-30	0,820	0,085	0,095	6,3	36,0	240
	30-50	0,790	0,070	0,080	3,6	24,0	240
5	0-30	0,821	0,090	0,090	6,7	40,0	200
	30-50	0,775	0,075	0,080	3,4	26,8	180
6	0-30	0,815	0,090	0,089	5,2	39,2	260
	30-50	0,770	0,080	0,078	3,5	31,1	220

2004 yr, autumn

1	0-30	0,790	0,078	0,100	6,1	27,0	180
	30-50	0,740	0,060	0,080	2,0	22,8	160
2	0-30	0,805	0,085	0,095	5,7	37,6	180
	30-50	0,750	0,070	0,078	3,6	24,8	150
3	0-30	0,790	0,067	0,096	6,1	38,8	180
	30-50	0,740	0,050	0,080	3,4	28,0	180
4	0-30	0,818	0,080	0,090	7,7	33,6	160
	30-50	0,795	0,060	0,075	4,3	22,8	140
5	0-30	0,828	0,104	0,095	10,6	37,4	180
	30-50	0,790	0,085	0,080	6,5	26,8	160
6	0-30	0,800	0,080	0,093	7,4	38,4	180
	30-50	0,750	0,070	0,075	5,4	30,4	160

2005 y, autumn

1	0-30	0,775	0,065	0,080	5,3	27,6	200
	30-50	0,733	0,050	0,060	2,0	22,8	180
2	0-30	0,790	0,070	0,085	6,6	33,1	180
	30-50	0,740	0,060	0,080	4,4	28,8	160
3	0-30	0,790	0,060	0,092	7,0	39,8	180
	30-50	0,745	0,045	0,075	5,3	23,0	160
4	0-30	0,843	0,110	0,095	12,3	45,4	160
	30-50	0,810	0,095	0,085	10,3	28,8	140
5	0-30	0,827	0,097	0,087	10,0	43,8	200
	30-50	0,800	0,080	0,070	8,7	23,2	160
6	0-30	0,831	0,108	0,095	11,9	44,1	180
	30-50	0,775	0,080	0,075	7,1	29,4	160

Effect of short-turn crop rotation on soil microbiological properties

The role of microorganisms in the soil in the formation of humus in the soil and the transition of the necessary chemicals to the state in which the plant can absorb them is incomparable.

From complex organic compounds of nitrogen in the soil, various amino acids are formed under the influence of microorganisms, while microorganisms absorb these substances. Part of the amino acids decompose as a result of the activity of microorganisms in the soil, releasing ammonia.

Ammonia, formed from the decomposition of organic substances in the soil, becomes a nutrient for plants, another part of this ammonia turns into nitric acid, forming nitrates in the soil. And nitrates are a source of plant nutrition. If the soil is soft and there is enough moisture, temperature and air for the plants, then the nitrification process will accelerate.

If the soil does not have enough of the above natural factors, nitrogen compounds are absorbed and the process of free nitrogen formation in the gas state occurs. This process is carried out by special microorganisms in the soil, denitrifiers. But part of the free nitrogen formed as a result of this process, along with atmospheric precipitation, returns in the form of nitrogen oxides and ammonia.

In fact, if the soil is in the norm of its agrophysical, water, water-physical properties, the action of microorganisms in it is activated, as a result of which the soil fertility increases. Therefore, the study of the extent and scope of the impact of agricultural crop rotation on the activities of micro-organisms in the soil is an important issue.

In the process of carrying out the research, data on the microbiological state of the soil and the changes in it were presented in (table 19).

According to the results of the initial microbiological analysis before the winter wheat in the autumn of 2002 in the experiment on typical grizzly soils, the amount of oligotrophs (3,73 million KOE), ammonifigators (0,97 million KOE), bacteria growing in mineral nitrogen (14,1 million KOE) and oligonitrophils (2,8 million

KOE/ha soil) was very low, and the number of denitrifying microorganisms was high. With a low number of bacteria growing in mineral nitrogen, a high number of denitrifying microorganisms causes the loss of nitrogen in the soil in the case of gas compounds.

According to the data obtained after the fall harvest, we can observe that in the 1st option of the study, the amount of oligotrophs decreased by 2,2 times compared to the initial indicators, in 2,3-options, the amount of ammonifiers increased by 17,5-11,3 times, the amount of bats increased by 1,9-5,2 times. This means that nitrogen is high in the process of decomposition of nitrogen, which is slightly absorbed from complex organic compounds. Even in the 4, 5, 6-options of the study, we can observe the above laws. It should be noted that in all other options of the 4-th option of the study, it was found that the number of batsils in the soil was 2-9 times lower than the number of ammonifiers when compared to the initial indicators. This condition indicates the presence of a sufficient amount of light nitrogen in the soil.

In the science of microbiology, the ratio of the interaction of oligotrophs and ammonifiers in the soil is determined by the pedotrophilic index, that is, the mutual ratio of the transition of nitrogen to a light absorbent form with the transition of uglerod to a humus form. According to the data obtained, in all options of the study, it was observed that the pedotrophil index was 1,5-30 times lower than the initial indicators. It was found that the process of decomposition of nitrogen-containing organic compounds in the 1, 2, 3-options, in which the 1:1 (winter wheat:cotton) system of continuous sow, grain and crop rotation was used, was superior to the process of humus formation. Crop rotation 1:1:1 (4,5,6-opt) winter wheat + repeated crop (beans) + intermediate crop (triticale) : cotton + intermediate crop (triticale) : bean, winter wheat + repeated crop (beans) + intermediate crop (triticale) : bean: cotton, winter wheat + repeated crop (beans) : cotton + intermediate crop (triticale) : this process in the bean link, namely nitrogen and the fact that the transformation of uglerod is in mutual harmony, which indicates the emergence of favorable conditions in the soil for plant nutrition. It was observed that the amount of bacteria-amylolytic microorganisms (which grow in mineral nitrogen determines the amount of ammonium compounds in the soil) that grow in mineral nitrogen was 2-5 times lower in the 2, 4, 5 and 6-options, unchanged in the 1 and 3-options than in the initial indicators. And the amount of actinomycetes was more than 7-18 times, which means that not only actinomycetes, but also amylolytic microorganisms are higher in volume. This condition can be explained only by the fact that a high amount of nitrogen, which actinomycetes are able to absorb, is accumulated in difficult decay compounds.

Oligonitrophilic microorganisms, however, mean the amount of nitrogen-free organic compounds that store uglerod in the soil. In the summer, their number increased by 1,3-3 times in 2, 3, 4-options compared to the initial indicators, while in 1, 5, 6-options decreased by 1,2-1,3 times.

The coefficient of immobilization denotes the process of decomposition of nitrogen compounds. It was found that this process was 10,3-20,7 times lower than the initial performance in the summer, in all other options from the 4th option of the study.

And the amount of denitrifiers in the soil determines the direction of transformation of nitrogen compounds. This means that the low content of denitrifying microorganisms in the soil means that nitrogen in the soil is less lost in the gas state.

In this by the data obtained in the summer on this process, it was found that in all options of the study, the number of denimator microorganisms was low.

According to the data obtained in winter wheat, there was an acceleration of biological activity in the soil. This is evidenced by the abundance of oligotrophs, amylolytic bacteria, actinomycetes, batsills, oligonitrophils and denitrifiers in the soil. In particular, the high content of batsilla and actinomycetes, pedotrophilic index and immobilization coefficient in the soil accelerate the transformation of nutrient elements. The high denitrification process in options 1 and 2 of the experiment resulted in the loss of nitrogen compounds in the gas state.

High content of batsilla and actinomycetes, as well as low content of ammonifiers, indicates the presence in the soil of complex forms of nitrogen assimilation. This makes it possible to preserve the elements of nutrients in winter.

According to the data obtained in the spring of the second year of the study, the transformation of nutrient compounds in the soil was very slow. In particular, in the soil there was a low content of ammoniferous bacteria, immobilization-mineralization coefficient, denitrifikators, which were used from ammonifikators, batsils, mineral nitrogen and actinomycetes. Also, low availability of oligotrophs and oligonitrophils, pedotrophilic index, reduced the decomposition of humus in the soil.

According to the data obtained in the autumn of the same year, it was observed that with the assimilation of uglerod by plants and a decrease in humus, the amount of oligotrophs and pedotrophilic indices in the soil increased. Also, the decrease in the amount of batsils, ammonifiers, nitrogen-containing bacteria, actinomycetes and denitrifiers also reduced the transformation of nitrogen into an organic and mineral form.

According to the data obtained in the last year of the study, 1:1:1 of crop rotation (4,5,6-opt) winter wheat + repeated crop (beans) + intermediate crop (triticale) : cotton + intermediate crop (triticale) : bean, winter wheat+ repeated crop (beans) + intermediate crop (triticale) : bean: cotton:winter wheat + repeated crop rotation (beans) : cotton + intermediate crop (triticale) : bean an increase in the amount of oligonitrophil microorganisms in link leads to a greater accumulation of organic compounds that store uglerod in its composition, the decrease in the amount of both the pedotrophil index and the denitrifier microorganisms paved the way for less loss of nitrogen-retaining compounds in the composition.

Based on the results of microbiological analysis conducted on typical soils of the Tashkent region, it can be concluded that the process of rapid mineralization of organic substances in the soil was observed in the control, 1 and 2 options of the study, and in the 4, 5 and 6 options the accumulation of nitrogen in the organic compound state on the account.

Table 19

The influence of microorganisms on the quantity and microbiological processes of exchanging planting systems on typical grizzly soils.

№	Options	Oligot-rophs	Ammo-nifiers (MPA)	Bacillies	MPA relative amount of bacilli, %	Pedotrophil index	The amount of bacteria tat grow in nitrogen		Oligo-nitrophils	Mineraliza tion coefficient	Amou nt of denitri fiers
		(PA)	b / a	(MS)	MS 100 / MPA	PA / MPA	b / a	%	b / a	KNA / MPA	
Initial indicators, 2002 yr, autumn											
		3,73	0,97 / 0,0	0,085	8,76	3,84	14,1 / 0,28	1,98	2,78 / 0,14	14,5	3,0
2003 yr, summer											
1	Cotton (control)	1,7	11,2 / 1,2	0,3	2,41	0,13	14,1 / 2,0	14,2	1,7 / 0,7	1,3	1,3
2	Winter wheat (control)	6,0	12,5 / 5,0	0,16	0,91	0,39	4,4 / 7,8	177,3	7,4 / 0,8	0,7	1,2
3	1:1 Winter wheat: Cotton	4,8	17,3 / 3,4	0,44	2,10	0,23	11,1 / 5,1	45,9	9,3 / 0,8	0,8	1,3
4	1:1:1 Winter wheat +beans+intermedite crop: Cotton + intermedite crop:soy bean	5,3	2,0 / 0,1	0,28	43,3	2,52	7,0 / 2,3	32,8	3,5 / 1,2	4,4	1,3

5	1:1:1 Winter wheat +beans +intermediate crop:soy bean: cotton	7,6	4,8/1,6	0,26	4,0	1,18	4,2/5,0	119,0	2,3/1,7	1,4	1,3
6	1:1:1 Winter wheat +beans:cotton +intermediate crop:bean	7,4	4,5/1,3	0,20	3,7	1,12	4,0/4,8	115,2	2,1/1,5	1,1	1,3
2003 yr, autumn											
1		39,0	2,0/0	0,61	30,5	19,5	45,0/14,0	31,1	86,0/2,4	22,5	2,5
2		42,4	20,3/0,1	0,57	2,79	0,14	156,0/34,0	21,7	203,0/2,2	10,0	2,5
3		9,7	2,5/0,04	0,14	5,49	2,15	35,5/6,0	16,9	50,0/3,2	14,2	6,0
4		11,0	1,17/0,01	0,35	23,6	15,9	19,0/13,7	72,1	29,3/2,3	12,9	6,0
5		29,6	3,7/0,5	0,33	7,86	1,87	20,8/7,8	37,5	55,0/1,3	5,62	6,0
6		25,7	3,9/0,4	0,35	7,36	1,95	18,8/6,9	34,3	54,3/1,2	4,95	6,0
2004 yr, spring											
1		18,1	2,56/0,1	0,09	3,39	6,8	10/0,8	8,0	18,0/7,0	3,77	0,25
2		11,0	3,8/0,4	0,12	3,16	2,9	23,2/6,9	29,7	5,5/1,0	6,1	6,0
3		10,3	2,8/0,3	0,36	12,9	3,7	17,5/1,5	8,5	37,3/3,6	6,25	6,0
4		10,1	4,8/0,2	0,17	3,54	2,1	16,1/1,1	6,8	20,4/6,0	3,35	6,0

5	6,0	1,7/0,01	0,14	8,2	3,5	23,2/6,5	28,0	23,0/2,0	13,6	0,25
6	66,8	3,77/0,1	0,21	5,57	1,1	7,1/0,6	8,45	16,0/4,6	1,88	0,25
2004 yr, autumn,										
1	52,6	5,1	0,19	3,72	4,12	8,6/1,4	16,3	44,0	1,96	0,06
2	28,0	6,0	0,04	0,61	4,6	3,8/0,5	13,2	30,0	0,6	0,06
3	38,0	3,4	0,07	2,06	11,1	54,0/2,2	4,1	24,5	16,5	0,06
4	44,0	0,7	0,08	11,4	62,8	7,6/0,5	6,6	15,4	11,6	0,006
5	42,0	1,4	0,11	7,86	30,0	5,1/1,3	25,5	14,8	4,6	0,025
6	11,0	1,6	0,07	4,43	14,0	11,2/0	0	58,5	7,1	0,006
2005 yr, autumn										
1	20,3	3,0	0,15	5,0	6,7	15,3/0,02	0,1	65,3	5,10	0,25
2	20,5	5,8	0,13	2,2	3,5	32,5/0,5	1,54	42,8	5,60	0,6
3	3,4	1,4	0,02	1,4	2,4	18,7/0,4	2,1	35,1	13,36	0,6
4	5,7	5,6	0,06	1,07	1,01	26,8/1,1	4,1	28,3	4,79	0,20
5	5,9	3,8	0,02	0,53	1,5	32,6/0	0,00	20,5	8,58	0,06
6	10,3	8,4	0,13	1,5	1,2	27,3/0,54	1,98	36,4	3,25	0,025

Table 20

Influence of exchange planting systems on the amount of micro organism in meadow-alluvial soils and microbiological processes

Options	Crop rotation systems	Oligot-rophs	Ammo-nifiers (MPA)	Bacillies	MPA relative amount of bacilli, %	Pedotrophil index	The amount of bacteria tat grow in nitrogen, %	Actinomycetes, %	Oligo-nitrophils	Mineralization coefficient	Denitrifiers
	2004 yr,spring										
1	Cotton (control)	28,2	5,8	0,42	7,24	9,86	6,9 3,1	44,9	7,5	1,19	0,50
2	Winter wheat (control)	10,6	6,4	0,39	6,10	1,66	22,0 3,0	13,6	10,7	3,44	0,20
3	1:1 Winter wheat: cotton	11,1	3,6	0,24	6,67	3,08	13,3 6,8	51,1	5,2	3,69	1,12
4	1:1:1 Winter wheat + beans +intermediate crop: cotton + intermedite crop:soy bean	31,4	1,96	0,22	11,22	16,0	27,5 1,0	3,64	3,3	14,0	0,25
5	1:1:1 Winter wheat + beans +intermediate crop :soy bean: cotton	11,8	2,8	0,52	18,6	4,21	7,0 7,0	100,0	6,1	2,5	0,060
6	1:1: Winter wheat + beans: cotton + intermedite crop:soy bean	11,6	2,5	0,64	25,6	4,64	13,5 3,5	25,9	14,9	5,4	0,060
	2004 yr, autumn										
1	Cotton (control)	29,0	4,9	0,7	14,3	5,92	13,7 6,3	46,0	32,0	4,1	25,0

2	Winter wheat (control)	35,0	3,0	0,6	20,0	11,7	37,0 8,0	21,6	47,0	15,0	25,0
3	1:1 Winter wheat: cotton	64,0	3,7	0,2	5,4	17,3	42,0 2,5	5,9	34,0	12,0	6,0
4	1:1:1 Winter wheat+ beans +intermediate crop: cotton + intermediate crop:soy bean	34,2	7,3	0,2	2,7	4,7	10,0 0,6	6,0	16,5	1,45	2,5
5	1:1:1 Winter wheat + beans +intermediate crop:soy bean: cotton	42,5	6,3	0,6	9,5	6,75	11,9 2,1	17,6	20,3	2,22	0,25
6	1:1: Winter wheat + beans: cotton + intermediate crop: soy bean	32,0	18,0	0,6	3,3	1,8	11,0 3,0	27,3	23,5	0,78	0,025

2005 yr, autumn

1	Cotton (control)	16,8	2,8	0,53	18,9	6,00	16,2 2,4	14,8	6,9	6,00	0,25
2	Winter wheat (control)	12,5	6,9	0,44	6,38	1,81	18,9 5,64	29,8	23,7	1,81	6,0
3	1:1 Winter wheat: cotton	32,7	4,3	0,12	2,7	7,60	3,87 0,05	0,36	16,8	3,22	0,2
4	1:1:1 Winter wheat + beans +intermediate crop: cotton + intermediate crop:soy bean	10,5	8,5	0,08	0,94	1,24	12,6 0,42	3,33	57,2	1,24	0,6
5	1:1:1 Winter wheat + beans +intermediate crop:soy bean: cotton	8,4	12,3	1,6	0,5	0,68	18,9 1,2	6,3	19,5	0,68	0,025
6	1:1:1 Winter wheat + beans: cotton + intermediate crop:soy bean	5,0	8,2	0,24	2,9	0,61	20,4 0,54	2,65	16,1	0,61	0,025

Table 21

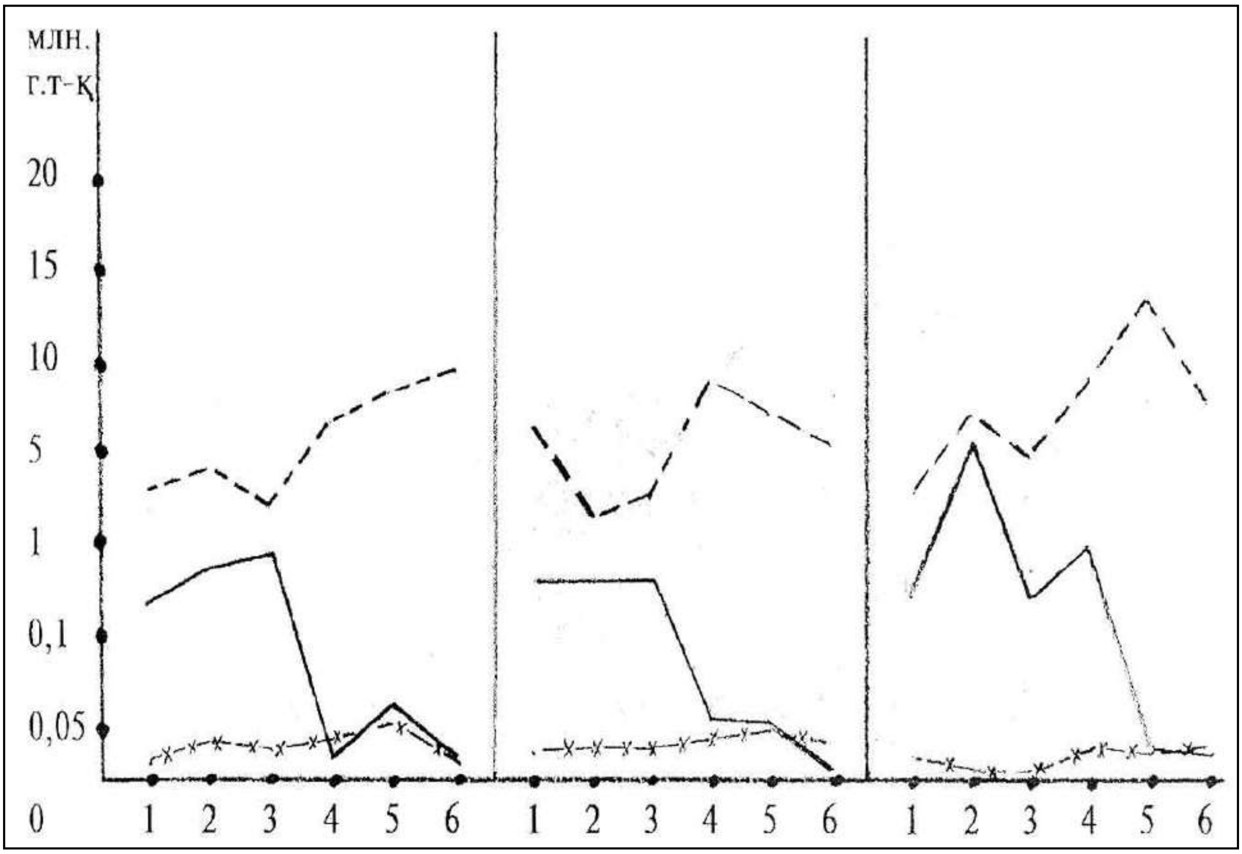
The influence of exchanging planting systems on the amount of microorganisms in the soil and microbiological processes 2004 yr, spring

Options	Oligot-rophs	Ammo-nifiers (MPA)	Bacillies	MPA relative amount of bacilli, %	Pedotrophil index	The amount of bacteria tat grow in nitrogen, %	Actinomycetes, %	Oligo-nitrophils	Mineralization coefficient	Denitrifiers
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
1	37,5	5,3	0,065	1,2	7,08	8,7 2,1	24,1	10,1	2,0	2,5
2	23,2	3,4	0,065	1,9	6,82	2,4 1,3	54,2	4,4	1,1	0,6
3	62,0	1,4	0,015	1,4	44,29	1,7 6,9	7,7	16,3	1,1	2,5
4	51,0	6,7	0,040	0,6	7,61	15,3 1,5	9,8	13,7	2,5	2,5
5	42,5	5,9	0,075	1,3	7,20	4,8 1,6	33,3	10,4	1,1	0,25
6	19,5	7,1	0,045	0,6	2,75	15,7 1,4	8,9	14,3	2,4	2,5

2004 yr, autumn

1	2	3	4	5	6	7	8	9	10	11
1	33,4	3,3	0,1	3,3	7,6	21,9 3,6	16,4	11,1	5,8	0,6
2	53,2	1,8	0,2	10,9	29,5	4,4 0,6	13,6	7,6	2,8	0,13
3	37,3	1,3	0,08	6,2	28,7	0,3 0,3	100	7,5	0,5	0,25
4	38,6	3,0	0,15	4,4	11,4	17,0 0,6	3,5	6,5	5,2	0,13
5	39,7	8,0	0,1	1,2	3,9	15,2 2,8	18,4	22,0	2,1	0,6
6	20,0	7,9	0,08	1,0	2,5	2,7 0,3	11,1	5,5	0,4	11,0
2005 yr, autumn										
1	25,2	5,3	0,3	5,66	4,75	24,8 2,5	10,1	17,0	4,7	0,025
2	22,3	8,2	0,4	5,24	2,7	6,8 0,85	12,5	16,8	0,82	0,25
3	5,6	2,4	0,12	5,00	2,33	5,2 2,4	46,15	42,8	2,17	0,20
4	2,8	1,8	0,05	2,78	1,56	16,6 0,03	0,18	31,0	9,2	0,06
5	4,5	6,9	0,08	1,16	0,65	18,6 1,2	6,45	22,7	2,7	0,06
6	7,1	5,7	0,05	0,87	1,25	7,3 0,8	10,96	24,2	1,28	0,013

Typical gray soils | **Loamy soils** | **Grass-alluvial soils**



6-drawing. The effect of short-turn crop rotation systems on soil microflore, at the end of the application period

---------------- ammonifiers, ___________ denitrifiers, x--x --x--x -x azotobacteria

Note: ***The initial amount of ammonifiers in the studied soils 0.9-1.2 mln/ha,the amount of denitrifiers 3.0-4.2 mln/ha. soil,and the amount of azotobacteria 0.014-0.017 mln/ha formed the soil.***

In general, the application of exchanging planting systems in the conditions of all experimental soils, that is, repeated cultivation of legumes-cereals and intermediate crops, as well as soybeans as the main crops, has created favorable conditions for soil fertility, as a result of the creation of a favorable environment for micro-organisms. On account of the decrease in the amount of indicators oligotrophs, batsilla, actinomycetes and pedotrophilic index in the soil caused a decrease in the process of decomposition of humus and nitrogen-containing organic substances, bacteria that assimilate mineral nitrogen, and an increase in the amount of ammoniferous and oligonitrophilic microorganisms paved the way for a greater accumulation of uglerod and nitrogen-containing organic substances.

Damage of the cotton with a fork in short-turn crop systems

Cotton villi (Verticillium dahlioe) is a fungus, widely distributed in the development phases of the cotton, causing great damage to its yield. In the fight against vilt, it is widely used mainly from agrotechnical measures, that is, such measures as the alternative of soil nutrient and water procedures. In our studies, the effect of crop rotation on the degree of damage of the cotton-plant with villi and ways to reduce the degree of damage through this agrotechnical measure was studied.

Repeated cultivation of legumes-cereals, intermediate crops and soybeans as the main crop in crop rotation systems was observed to have a positive effect on the degree of damage to the cotton-plant with villi.

According to the data obtained, in the first 1.10.2002 year of the study, it was observed that in almost all optains the pores were damaged 22,1-25,0% by vilt. In the last 3 years of the study, the incidence rate was 15,8% (2-6 opt) when the cotton was grown after repeated mash in the 1:1 crop rotation system, and in the same system when the cotton was grown after repeated mash and intermediate crop rye, this figure was 12,4%.

In the 2:1 system of crop rotation, winter wheat was planted with a repeated crop beans for two consecutive years, then the disease rate was 10,2% when the crop was grown, while in the same system the fall of the cotton-plant was planted for two consecutive years, and when the repeated crop and the intermediate crop was taken care of after the same patterns are observed in another study conducted under typical gray soil conditions.(23-drawing)

Based on the above information, it can be concluded that as a result of planting the cotton in a chronic field, the degree of damage to villi increases, with repeated legumes-grains (beans), intermediate crops (rye, triticale) planted in the autumn wheat in the bud-grain-exchange planting systems, and when the main crop is grown after the bean, the degree of disease 56-77%.

The thickness of the seedling, growth, development, yield and technological indicators of cotton

The number of grasses in the soil, its location in the field and the fertility of the soil are important in ensuring productivity.

Also, the thickness of the seedling of the cotton is an inseparable link to the alternating planting, that is to the type of the former crop. According to the results of the studies, if the thickness of the seedling in the 1 and 3 options decreased by 6,3-6,5% compared to the beginning of the validity period at the end of the validity period, the 1:1 system of crop rotation winter wheat+repeated crop (beans)+intermediate crop (triticale) : cotton +intermediate crop (triticale) : bean (4-opt), winter wheat+repeated crop(beans) +intermediate crop (triticale) and winter wheat+repeated crop (beans) :cotton +intermediate crop (triticale):at the end of the period of validity of care after repeated and intermediate crops of the cotton in bean (6-opt) had a positive effect on the number of seedlings, and the number of plants that perished was an average of 2,8-3,9%.

According to the data obtained in the conditions of meadow-alluvial soils on the seedling thickness of the cotton, at the end of the validity period of the second year of the study, a minimum number of seedling deaths (2,6%) were observed in the 6th option of the experiment. As a result of sowing after the intermediate crop (triticale), the destruction of seedlings was the highest (5,9%). Also, the planting after the bean of the crop in the crop system of the crop (24, 25-tables) also ensured that the seedlings were preserved in a large amount of 3,1%.

Table 22

Degree of damage to the corn villi disease on the swapped cotton fields, %
(Uzpiti, MTKh, 2000-2002 yrs.)

№	Options 2000 yr.	Damage, %				Options 2001 yr.	Damage, %				Options 2002 yr.	Damage, %			
		1.VII	1.VIII	1.IX	1.X.		1.VII	1.VIII	1.IX	1.X.		1.VII	1.VIII	1.IX	1.X.
1	Cotton	5,3	13,5	20,1	23,2	Winter wheat	-	-	-	-	Cotton	6,4	9,1	14,0	27,3
2	Cotton	5,0	9,8	19,0	25,0	Winter wheat + soy beans	-	-	-	-	Cotton	1,4	3,0	13,6	15,8
3	Cotton	6,6	10,2	20,0	22,1	Winter wheat + soy beans + intermediate crop (rye)	-	-	-	-	Cotton	0,1	1,5	10,3	12,4
4	Cotton + intermediate crop (rye)	4,4	8,0	19,4	23,0	Cotton	6,3	7,0	15,3	17,1	Winter wheat +soy beans	-	-	-	-
5	Winter wheat +soy beans	-	-	-	-	Winter wheat +soy beans	-	-	-	-	Cotton	-	0,1	7,4	10,2
6	Winter wheat + soy beans	-	-	-	-	Winter wheat +soy beans + intermediate crop (rye)	-	-	-	-	Cotton	-	-	3,1	6,1

Table 23

**Degree of damage to the corn villi disease in the swapped cotton fields, %
(2002-2005 yrs.)**

№	Options 2003 yr.	Damage %				Options 2004 yr.	Damage %				Options 2005 yr.	Damage %			
		1.VII	1.VIII	1.IX	1.X.		1.VII	1.VIII	1.IX	1.X.		1.VII	1.VIII	1.IX	1.X
1	Cotton	12,1	15,5	29,3	32,8	Cotton	12,1	19,8	25,2	35,0	Cotton				
2	Winter wheat	-	-	-	-	Winter wheat	-	-	-	-	Winter wheat	-	-	-	-
3	Winter wheat	-	-	-	-	Cotton	10,0	17,9	26,1	28,9	Winter wheat	-	-	-	-
4	Winter wheat +soy beans+ intermediate crop (triticale)	-	-	-	-	Cotton + intermediate crop (triticale)	3,3	4,7	1,4	14,0	Soy bean	-	-	-	-
5	Winter wheat +soy beans +intermediate crop (triticale)	-	-	-	-	Soy bean	-	-	-	-	Cotton	1,6	3,5	13,6	15,7
6	Winter wheat +soy beans	-	-	-	-	Cotton +intermediate crop (triticale)	3,1	5,6	12,5	15,6	Cotton	-	-	-	-

These legislations were also observed in the study conducted under the conditions of fertile soils. Repeated after the fall, and then the sowing of intermediate crops, as a result of increasing soil fertility, creating a clean ecological environment, improving the water, water-physical condition of the soil, the process of growth and development of the cotton is normalized, which causes the acceleration of physiological processes in it and its viability.

In the first year of the study, according to the system, the manure was sown in 1, 2, 3, 4-options. During the period of validity, there was practically no difference in the growth and development of the larynx between the options. According to the data obtained at the end of the validity period, the length of the cotton is an average of 84,3-90,7 sm. and the number of breasts was 9,8-11,5 pieces. In the second year of the experiment, cotton +intermediate crop was planted after rye to the fourth option, based on the 2:1 alternating sowing system. In this option, the growth and development of the cotton surpassed the results of the first year of the study or the growth and development of the pig planted after 1:1 of the alternation, cotton : winter wheat : winter wheat in the cotton system. In the 1:1 system of crop rotation, the height of the crop was 90,7 sm, the number of pods was 9,8 piece, in the pumice planted after the intermediate rye, respectively, 94,0 sm and 12,3 piece.

The impact of crop rotation systems on the growth and development of the crop was mainly observed in the last third year of the stud.According to the results of the study, the highest indicators for the development of the goose were observed in the 5 and 6 options, namely the crop cotton -grain (beans) of the 2:1 system of cotton -grain crop (beans): winter wheat + repeated crop (beans): winter wheat and repeated crop (beans): winter wheat + repeated crop (beans): intermediate crop (rye): observed in the height of the cotton is 11,4-16,2 sm, respectively, compared to the control 1-option, while the number of breasts was more than 2,9-3,3 pieces. In the 2 and 3 options, that is, the cotton-grain crop of the 1:1 system of crop rotation : winter wheat+repeated crop : cotton: winter wheat+repeated crop+intermediate crop (rye) : the height of the cotton in the link is 89,1-92,6 sm respectively, the number of pitches amounted

Table 24

The thicknessof the seedlings in cotton crop rotation systems, thousand/ha (1999-2002 yrs.)

Options	Crop rotation systems	Types of crops by years in crop rotation systems			2000 yr.		2001 yr.		2002 yr.	
		2000 yr.	2001 yr.	2002 ry.	Seedling thickness at the beginning of the application period, thou/ha	Seedling thickness at the end of the application period, thou/ha/%	Seedling thickness at the beginning of the application period, thou/ha	Seedling thickness at the end of the application period, thou/ha/%	Seedling thickness at the beginning of the application period, thou/ha	Seedling thickness at the end of the application period, thou/ha/%
1	1:1	Cotton	Winter wheat	Cotton	105,0	96,2/8,3	-	-	93,3	89,3/4,3
2	1:1	Cotton	Winter wheat + repeated crop (beans)	Cotton	105,0	95,6/8,9	-	-	94,8	92,7/2,2
3	1:1	Cotton	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	105,0	95,2/9,3	-	-	89,5	87,4/2,3
4	2:1	Cotton	Cotton + intermediate crop	Winter wheat + repeated crop (beans)	105,0	95,3/9,2	105,0	92,5/11,9	-	-
5	2:1	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)	Cotton	-	-	-	-	95,6	93,1/2,6
6	2:1	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	-	-	-	-	91,7	90,0/1,7

Table 25

Seedling thickness of the cotton in different exchanging planting systems, thousand / ha (2002-2005 yrs)

№	Crop rotation systems	Type of crops by years in crop rotation systems			2003 year			2004 year			2005 year		
		2003 yr.	2004 ry.	2005 yr.	At the beginning of the validty period	At the end of the validty period	The seedling dies, %	At the beginning of the validty period	At the end of the validty period	The seedling dies, %	At the beginning of the validty period	At the end of the validty period	The seedling dies, %
1	Control	Cotton	Cotton	Cotton	90,0	84,3	6,3	92,3	85,7	7,1	92,7	85,2	8,0
2	Control	Winter wheat	Winter wheat	Winter wheat	-	-	-	-	-	-	-	-	-
3	1:1	Winter wheat	Cotton	Winter wheat	-	-	-	92,5	86,8	6,5	-	-	-
4	1:1:1	Winter wheat + repeated crop (beans)+ intermediate crop (triticale)	Cotton + intermediate crop (triticale)	Soy bean	-	-	-	88,6	86,1	2,8	-	-	-
5	1:1:1	Winter wheat + repeated crop (beans)+ intermediate crop (triticale)	Soy bean	Cotton	-	-	-	-	-	-	93,5	90,7	3,0
6	1:1:1	Winter wheat + repeated crop (beans)	Cotton plant + intermediate crop (triticale)	Soy bean	-	-	-	93,4	89,8	3,9	-	-	-

to 13.1-13.6 grains. This means that compared to the control option, the height of the cotton-plant was 6,7-10,2 sm, and the number of breasts was more than 1,7-2,2 pieces. According to another experiment, in the 1:1 system of alternating sowing, after repeated mosh planting in the fall, the buds planted after it height control without repeated crop (1-opt) is 6.7 sm compared to the option, the number of burrows is 1.7 piece, in this system, when care is taken in the field without repeated crop after the fall, its height is 5.2 sm compared to the option planted with chronic burrow tall, the number of breasts was more than 0.8 pieces. Relatively high indicators in the 6th option of the experiment, cotton-grain 1 : 1 : 1 winter wheat of the alternating system+repeated crop (beans): cotton +intermediate crop (triticale): in the bean harvester, the cotton was observed in the winter wheat and after repeated beans in the post-care option. The height of the plant is 15,1 sm compared to the control option high, it was observed that the number of breasts was more than 1,6 pieces. And the highest figures are observed in the 5th option cotton 1: 1: 1 in the system, the height of the plant when taken care of after the fall+repeated crop (beans)+intermediate planting is 95,7 sm and the number of breasts was 9,8 piece. This means that the control is 17,3 sm tall and 2,1 pieces more, respectively, than the option. Also, in the 1:1:1 system, the highest indicators are shown in the winter wheat+repeated crop (beans)+intermediate crop and in the third year after the bean, the height of the cotton is 95,9 sm and the number of pitches was 9,1 piece.

It can be seen that in this experiment, too, results are obtained as in the first experiment, and in order for the cotton to grow in moderation, it is necessary to exchange it for 1:1, 1:1:1, 2:1 in systems such as repeated and intermediate crops after fall and planted after bean, care gave positive results (tables 26, 27).

According to the results of studies on meadow-alluvial soils, in the first year of the study, the height of the cotton in the control option was 80,1 sm. it was determined that the number of breasts was 9,5 pieces. The main results were obtained in the second year of the experiment, in which there was a positive effect of repeated legumes-cereals and intermediate crops planted after the fall. In the 1:1:1 system of crop rotation, the plant height is 93,4 sm when the crop is grown after repeated and intermediate crops (4-opt) planted after the fall and the number of burrows was 11,2 piece. Also, only repeated legumes after the fall-sowing of cereals also gave a positive result, the indicators are respectively 92,6 sm. and it turned out that it was 10,4 pieces. In the last year of the study, the planting of the system after the soy, which was planted mainly as the main crop of the cotton also had a positive effect on its growth and development, the plant height is 77,2 sm the number of squares amounted to 10,8 piece.

Data on the impact of crop rotation systems on cotton yield are presented in tables 28, 29 and drawing 7.

According to data from the experience conducted in 2000-2002 years, in the first year of observations, the yield of cotton (1, 2, 3, 4-opt) was close to each other in the options for growing cotton – 3,09-3,1-3,03-3,25 t/ha. In the second year of the experiment, the yield reached only 4-th option by system, when the cotton was grown after the intermediate sowing, the yield was 3,51 t/ha. According to data, the highest cotton crop in the experiment was obtained from 5-and 6-options. In this porcupine 2:1 in the system of crop rotation, the yield of the porcupine in the options grown after two consecutive years of winter wheat, repeated crop beans and intermediate crop rye respectively 3,61 t/ha and 3,67 t/ha. made up. This means that an additional cotton crop of 0,45-0,51 t/ha was obtained, respectively, in relation to the yield in the 1-th option, that is, the repeated crop after the cotton.

In other options of the experiment, 1:1 of the crop rotation, that is, the crop:winter wheat+repeated crop (beans):in the case of winter wheat+repeated crop rotation,the yield of the crop is 3,3 t/ha when the crop is grown after the harvest in the same system,this indicator is up to 3,42 t/ha grown winter wheat+repeated crop+intermediate crop made up. In these options, an additional cotton crop is compared to the control option, respectively, to 0,14-0,26 t/ha. made up.

According to data from the experience of 2002-2005 years, in the first year of research, the yield in only one option that is, in the control option, where the is grown, is 2,62 t/ha. made up. This indicator was also confirmed in the next year.

Table 26

Growth and development of cotton in short-turn crop rotation systems

Options	Types of crops by years			Periods of phonological observations, 2000 year									
				1.06		1.07			1.08			2.09	
	2000 yr.	2001 yr.	2002 yr.	Heigh, sm.	The number of true leaves, piece	Heigh, sm.	Buttons, piece	Flowers, piece	Heigh, sm.	Boll, piece	Flower and nodes , piece	Heigh, sm.	Number of bolls, piece
1	Cotton	Winter wheat	Cotton	12,7	4,1	38,9	4,9	1,3	80,7	3,6	12,4	90,7	9,8
2	Cotton	Winter wheat + repeated crop (beans)	Cotton	12,9	4,2	41,0	4,5	1,8	77,9	3,9	11,9	86,7	11,5
3	Cotton	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	13,4	4,2	41,0	4,2	1,1	76,6	3,8	12,3	88,1	10,7
4	Cotton + intermediate crop (rye)	Cotton	Winter wheat + repeated crop (beans)	12,4	4,3	44,0	4,8	1,9	73,7	3,2	12,0	84,3	11,0
2001 year													
4	Cotton + intermediate crop	Cotton	Winter wheat + repeated crop (beans)	17,7	6,6	45,3	17,5	2,3	81,4	4,3	13,1	94,0	12,3

read more

2002 year

1	Cotton	Winter wheat	Cotton	5,7	3,1	23,7	4,3	-	71,3	3,2	11,7	82,4	11,4
2	Cotton	Winter wheat + repeated crop (beans)	Cotton	5,4	2,8	28,1	4,8	-	77,1	4,0	12,4	89,1	13,1
3	Cotton	Winter wheat+ repeated crop (beans)+ intermediate crop (rye)	Cotton	5,0	2,5	21,3	3,7	-	69,6	3,5	11,0	92,6	13,6
5	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)	Cotton	5,8	3,5	30,6	5,4	-	82,5	4,1	14,5	98,6	14,3
6	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	5,1	2,8	24,6	3,9	-	75,8	3,8	14,0	93,8	14,7

Table 27

Growth and development of cotton-plant in short-turn crop rotation systems

Opt.	Types of crops by years			Periods of phonological observations										
				1.06		1.07			1.08				2.09	
	2003 yr.	2004 yr.	2005yr.	Heigh sm.	The number of true leaves, piece	Heigh, sm.	Buttons, piece	Flowers piece	Heigh, sm.	Nodes,piece	Crops, piece	Number of bolls, piece	Heigh sm.	Number of bolls, piece
2003 year														
1	Cotton	Cotton	Cotton	9,9	3,3	38,3	3,4	0,8	75,4	6,7	10,3	5,7	86,3	9,6
2004 year														
1	Cotton	Cotton	Cotton	15,0	4,2	45,6	10,4	1,1	69,4	3,4	10,1	5,2	78,4	7,2
3	Winter wheat	Cotton	Winter wheat	15,9	4,6	48,3	9,0	0,9	72,2	4,4	10,5	5,0	83,6	8,0
4	Winter wheat + repeated crop (beans)+ intermediate crop (triticale)	Cotton + intermediate crop (triticale)	Soy bean	17,4	5,3	59,6	9,1	1,0	87,4	5,2	12,3	7,6	95,7	9,3
6	Winter wheat + repeated crop (beans)	Cotton + intermediate crop (triticale)	Soy bean	16,4	4,9	53,0	9,3	0,9	82,8	3,3	11,0	7,2	93,6	8,8
2005 year														
1	Cotton	Cotton	Cotton	11,0	3,1	34,8	3,3	0,8	71,5	7,1	10,3	6,3	81,4	7,4
5	Winter wheat + repeated crop (beans)+ intermediate crop (triticale)	Soy bean	Cotton	10,2	2,7	37,0	7,5	1,8	87,3	5,0	12,4	9,1	95,9	9,1

And the main results in the experiment were obtained in the second year.

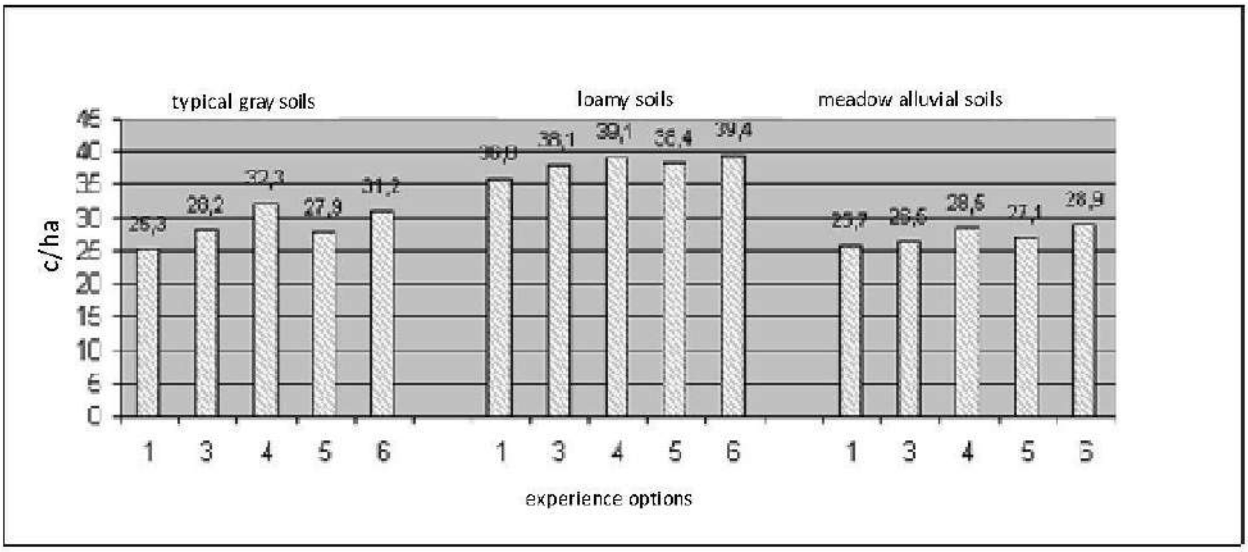
Experience 1: 1, yield to 2,82 t/ha when grown after the fall of the crop in the crop rotation system made up. When the cotton was grown after winter wheat+repeated beans+intermediate crop rye was harvested to 3,23 t/ha. This is the highest result this year among the options in the experiment. In the 6-th option of the experiment, that is in the 1:1:1 system of crop rotation, the yield is 3,12 t/ha when growing the cotton after the fall+repeated sowing made up. In these options (3, 4, 6-opt), additional cotton crop control is appropriate in relation to the option 0,2-0,6-0,5 t/ha. And in the third year of the experiment, the yield was quail to 2,79 t/ha in care after the pig bean, and an additional yield of 0,43 t/ha in relation to the control option was obtained.

Based on these data, it can be concluded that after the fall, repeated beans and intermediate crops were grown on rye, and in the next year when the cotton was grown on this field, the following year : winter wheat : control in the cotton system was increased to 0,14-0,26 t/ha, in the 2:1 exchange sowing system to 0,46-0,5 t/ha, when grown the control of chronic porcine cultivation is up to 0,2 t/ha, after winter wheat+repeated crop (beans) to 0,5 t/ha compared to the control option, after winter wheat + repeated crop (beans)+intermediate crop (rye), an additional cotton crop of 0,6 t/ha was obtained. Similar data were also observed in experiments with other soil climatic conditions of the Republic.

According to the experiment data on coarse soils of Kashkadarya region, in the 1:1:1 crop rotation system, when sown after repeated crops, 0,3 t/ha, when sown after repeated and intermediate crops, 0,29 t/ha, when sown after winter wheat or intermediate crops, 0,19 t/ha, when sown after the main crop bean, compared to the control option, 0,28 t/ha in addition, in experiments conducted on Khorezm meadow-alluvial soils, additional yield was obtained at 0.22 t/ha after cultivation of cotton after bean in the alternating planting system, at 0.3 t/ha after repeated cultivation, at 0.27 t/ha after repeated and intermediate cultivation.

In addition to increasing the yield on cotton, it is also of particular importance to improve its quality. Data on the technological performance of cotton fibers are presented in tables 30 and 31.

According to the data from the first experiment, the output of fiber by options from the options "Akdarya-6", planted in the first year of the experiment, respectively 34,5-34,2-34,4-34,5%, fiber length 33,2-34,4-33,4-33,3 mm. made up. And the mass of 1000 pieces of seeds is 118,6-120,4 g. it turned out to be. According to the data of the second year of the experiment, only 4-th option of the experiment this year is a cotton, planted after the second year of sowing the cotton +intermediate crop, the output of this cotton fiber is 34,3%, the length of the fiber is 34,6 mm. made up. And the curd mass of 1000 pieces is 114,7 g. was equal. In the third year of the experiment, cotton was planted on 5 options, based on the established systems. In the 1-th option of the experiment, the fiber output in the sow after the fall is 33,7%, the fiber length is 33,4 mm., 1000 pieces of seed mass 120,9 g. in the 2-th option of the experiment, that is, in the case of winter wheat+repeated sown after harvest, these indicators are respectively 35,1%-33,0 mm-122,4 g. (30, 31-tables, 7-drawing).



7-drawing. Impact of short-turn crop rotation systems on cotton t/ha

Note: ***The 2-nd option of the experiments was planted with winter wheat as a control: 1-option, cotton, (control), 2-option winter wheat, (control), 3-option, 1:1 (winter wheat : cotton: winter wheat), 4-option, 1:1:1 (winter wheat + repeated crop beans + intermediate crop triticale : cotton + intermediate crop triticale : bean), 5- option, 1:1:1 (winter wheat + repeated crop+ intermediate crop triticale: bean : cotton), 6- option, 1:1:1 (winter wheat ;repeated crop beans; cotton + intermediate crop triticale; bea***

Table 28

Cotton yield in short-turn crop rotation systems, t/ha
(2000-2002 yrs)

Experience options	Types of crops by years			Productivity on fields, t/ha					Average productivity on fields, t/ha
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 yr. (1-field)	2002 yr. (2-field)	2002 yr. (1-field)	2003 yr. (2-field)	
1	Cotton	Winter wheat	Cotton	3,09	-	-	3,01	3,32	3,16
2	Cotton	Winter wheat + repeated crop (beans)	Cotton	3,1	-	-	3,14	3,47	3,30
3	Cotton	Winter wheat+ repeated crop (beans)+ intermediate crop (rye)	Cotton	3,03	-	-	3,21	3,64	3,42
4	Cotton + intermediate crop (rye)	Cotton	Winter wheat + repeated crop	3,,5	3,35	3,68	-	-	3,51
5	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)	Cotton	-	-	-	3,42	3,81	3,61
6	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	-	-	-	3,46	3,89	3,67

Sx-0,61% NSR_{05}-0,18 t/ha; Sx-0,20% NSR_{05}-0,059 t/ha.

Table 29

Cotton yield grown in short-turn crop rotation systems, t/ha (2002-2005 yrs)

Options	Types of crops by years			Productivity on fields , t/ha			Average productivity, t/ha
	2003 yr.	2004 yr.	2005 yr.	2003 yr.	2004 yr. (1-field)	2005 yr. (2-field)	
1	Cotton	Cotton	Cotton	2,62	2,62	2,36	2,53
3	Winter wheat	Cotton	Winter wheat	-	2,96	2,69	2,82
4	Winter wheat + repeated crop (beans)+ intermediate crop (triticale)	Cotton + intermediate crop (triticale)	Soy bean	-	3,41	3,06	3,23
5	Winter wheat + repeated crop	Soy bean	Cotton	-	2,94	2,64	2,79
6	Winter wheat + repeated crop (beans)	Cotton + intermediate crop (triticale)	Soy bean	-	3,30	2,95	3,12

Sx-0,47% NSR_{05}-0,141 t/ha; Sx-0,59% NSR_{05}-0,175 t/ha

The highest figures on fiber output and 1000 piece of seed mass were observed in the 5-and 6-options of the experiment. After the winter wheat in this series, repeated and intermediate crops are grown, after which the cotton wool of the planted cotton-plant has a positive effect on the indicators, the fiber output is respectively 36,0% -36,1%, the seed mass of 1000 pieces is 126,7-126,5 g. made up. The relative break strength was found to be 27,6-27,7 g/strong/plane. Repeated and intermediate crops cultivation after the fall also had a positive effect on fiber indicators (3-opt), 35,4% -122,8 g. became known to be equal. According to the second experiment, in the first year, only in the first option, the pulp is grown, the fiber output from it is 34,7%, the fiber length is 31,1 mm, the seed mass of 1000 pieces is 110,3 g. made up. In the second year of experience, the above indicators in this option are respectively 33,7%, 30,5 mm, 118,5 g. took the view. In the 3-th option planted after the fall of the cotton, the fiber output is 36,4%, the fiber length is 32,0 mm, the seed mass of 1000 pieces is 120,5 g. made up. Fiber indicators are high 37,1%-21,3 mm when grown after the cotton winter wheat+repeated crop+intermediate crop 123,7 g. In the 6th option of the experiment, the fiber output is 37,0%, the fiber length is 32,6 mm, the seed mass of 1000 pieces is 119,5 g. made up.

In the third year of the experiment, when the cotton was grown after the bean, the quality indicators of the cotton became higher. In this fiber output 37,1%, fiber length 32,6 mm, 1000 pieces of seed mass 126,4 g. made up. In the experiment conducted in the conditions of meadow alluvail soils (Khorezm branch), the "Khorezm-127" varieties of the cotton were planted. Judging by the data obtained on the quality indicators of this varieties of fiber, it was observed that the switching planting systems have a positive effect on the cotton fiber. In 4-and 5-options of the experiment, when the cotton is grown after repeated and intermediate crops, the fiber length is 33,0-33,5 mm. respectively, fiber output 35,0-34,5%, seed mass of 1000 pieces 119-121 g. made up. When the cotton is grown after repeated legumes-cereals, intermediate crops and main crops, more positive results are obtained, this fiber output is 35,0-35,5%, length 33,0-34,0 mm. 1000 pieces of seed mass 123-125 g. it was observed that it was.

In the conditions of barren soils of Kashkadarya region, the "Bukhara-6" variety of cotton was planted. It was observed that even in these soil conditions, crop rotation systems had a positive effect on fiber quality indicators. In the 4 and 5 options of the experiment, the highest data are obtained, in this fiber output is 34,4 and 34,9% respectively, the fiber length is 34,1 mm. and 33,7 mm., 1000 pieces of hemp mass is 119 and 121 g. made up. In the 5 option of the experiment, data are also obtained that are close, the fiber output is 34,1%, the fiber length is 33,8 mm, the seed mass of 1000 pieces is 116 g. was observed. In general, crop rotation systems have had a positive impact on other quality indicators of cotton.From the above information it can be concluded that in the short-turn crop systems studied in the experiments, cultivation after repeated legume-grain (beans) and intermediate crop (triticale) of cotton in the conditions of typical gray of Tashkent region, typical soils of Kashkadarya region, and in the conditions of meadow-alluvial soils of Khorezm region provides for obtaining quality fiber.

Table 30

Technological quality indicators of cotton fiber (2000-2002 yrs, "Akdarya-6" variety)

Options	Types of crops by years			Fiber output, %	Weight of a 1000 seeds, g.	Micronaire	Tensile strength	Linear density	Maturiy coefficient	Relative tensile strength g/plane	Fiber length, mm.
	2000 yr.	2001 yr.	2002 yr.								
1	Cotton	Winter wheat	Cotton	34,5	119,7	4,0	4,2	172	2,0	26,2	33,2
2	Cotton	Winter wheat + repeated crop (beans)	Cotton	34,2	120,3	4,1	4,1	172	1,9	26,0	34,4
3	Cotton	Winter wheat + repeated crop (beans)+ intermediate crop (rye)	Cotton	34,4	118,6	4,1	4,2	173	1,9	26,7	33,4
4	Cotton + intermediate crop (rye)	Cotton	Winter wheat + repeated crop (beans)	34,5	120,4	4,1	4,2	172	2,0	26,2	33,3
2001 year											
4	Cotton + intermediate crop (rye)	Cotton	Winter wheat + repeated crop (beans)	34,3	114,7	4,2	4,4	176	2,0	26,7	34,6
2002 year											
1	Cotton	Winter wheat	Cotton	33,7	110,9	4,1	4,2	173	1,9	24,6	32,4
2	Cotton	Winter wheat + repeated crop (beans)	Cotton	35,1	122,4	4,3	4,3	174	2,0	24,9	32,0
3	Cotton	Winter wheat + repeated crop (beans)	Cotton	35,4	122,8	4,3	4,3	175	2,0	25,3	31,8
5	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans)	Cotton	36,0	126,7	4,4	4,4	176	2,1	25,6	31,2
6	Winter wheat + repeated crop (beans)	Winter wheat + repeated crop (beans))+ intermediate crop (rye)	Cotton	36,1	126,5	4,4	4,4	176	2,0	25,7	31,0

Table 31

Technological quality indicators of cotton fiber (2002-2005 yrs.) 2003 year

Options	Types of crops by years			Fiber output, %	Weight of a 1000 seeds ,g.	Micronaire	Tensile strength, g/power	Linear density	Maturiy coefficient	Relative tensile strength, g/str/p	Fiber length, mm.
	2003 yr.	2004 yr.	2005 yr.								
1	Cotton	Cotton	Cotton	34,7	110,3	4,0	4,2	171	1,9	26,4	31,1
2004 year											
1	Cotton	Cotton	Cotton	33,7	118,5	4,0	4,2	173	1,9	26,3	30,5
3	Winter wheat	Cotton	Winter wheat	36,4	120,5	4,1	4,4	178	2,0	26,7	32,0
4	Winter wheat + repeated crop (beans) + intermediate crop (triticale)	Cotton + intermediate crop (triticale)	Soy bean	37,1	123,7	4,3	4,1	172	1,9	26,1	31,3
6	Winter wheat + repeated crop (beans)	Cotton + intermediate crop (triticale)	Soy bean	37,0	129,5	4,3	4,3	174	1,9	26,4	32,6
2005 year											
1	Cotton	Cotton	Cotton	33,5	127,7	4,3	4,1	171	1,9	26,0	30,1
5	Winter wheat + repeated crop (beans)	Soy bean	Cotton	37,1	126,4	4,4	4,4	178	2,0	27,1	32,6

Results of experiments in production

Production experiments were carried out in the farmer farms of the northern region of our country-Khorezm region, southern region-Kashkadarya region and Tashkent region in 1999-2005.Preliminary production experiments Kibray district Q.Khodiev farm (farmer Q. Khodiev). It was observed that short-turn crop rotation 1:1:1, winter wheat+beans +intermediate crop (triticale) : cotton +intermediate crop (triticale) : bean and 1:1:1, winter wheat+beans : cotton +intermediate crop (triticale): in such systems as beans, the growth, development and yield of the cotton "Akdarya-6" was observed.

According to the results obtained, the yield from the cotton-plant grown in these systems was obtained accordingly to 3,12; 3,28 t/ha. of the same district.Farmer farm named after R.Ziyovuddinov (farmer R.Ziyovuddinov), respectively, 3,55; 3,34 t/ha were received in the same systems. Economic efficiency average was from 120000 to 200000 sum.

SH. Normurodova of the profession district in the farm of a farmer named (farmer SH.Normurodova) of these systems were obtained to 3,17; 3,08 t/ha, in the farmer's farm "Umida mother" of Shahrisabz district, 3,48; 3,67 t/ha, in farmer's farm "Amudarya" of the target district, 3,07; 2,93 t/ha, in farmer's farm "Samarkand" of Kamashi district, 3,27-3,13 t/ha. Efficiency made 155-220 thousand sum/ha.

The same short-turn crop systems were tested in the “Khorezm-127” varieties of cotton on the fields of farmer farms of Khorezm region. Gurlan district's "Cherkash" Farm (farmer J.Umarov) according to the data obtained from the test fields, in the above-exchanged planting systems, when the crop was grown after repeated crop (beans), intermediate crop (triticale) and main crop bean, it was harvested from cotton to 2,95; 3,11 t/ha, in the fields of the farm "Batrak" of the Khiva district Amir Temur farm to 3,06; 3,25 t/ha, in the efficiency amounted to 175-220 thousand sum/ha. Also, testing experiments on short-turn crop rotation were conducted in the fields of the Central experimental farm of Uzpiti. In the experiment 2 : 1, winter wheat+beans : winter wheat+beans+ intermediate crop (rye): the system of crop rotation was studied.According to the research, after winter wheat, repeated crops and intermediate crops, the crop was harvested to 3,09 t/ha and the economic output was 205000 sum (table 32). In general, the data collected in the experiment fully confirmed the data and recommendations received in conducting scientific research.The results of the production experience on the study of agrotechnics of the cultivation of crops included in the cotton complex, determination of exchange planting systems that preserve and increase soil fertility in the conditions of the main cotton-growing regions of the country, ensuring high and quality harvest from agricultural crops, are discussed and approved in many scientific-practical conferences and seminars with the scientific-practical conference on "soil tillage and technology of sequential planting of agricultural crops before planting of grain-grain and leguminous cereals" organized by the scientific-production center of Uzbekistan, the International Center for scientific research on agriculture in arid regions IKARDA(Syria)and the council of Tashkent region (July 20, 2001).the state of Science and technology of the Republic of Uzbekistan, on August 24, 2001, in the scientific-practical conference on "soil fertility-the basis of agricultural crop yields" jointly organized by the Ministry of Agriculture and water resources of the Republic of Uzbekistan and the scientific-production center of the Republic of Uzbekistan, on the international scientific-practical conference "soil fertility-the basis of agricultural crop yields" in the Parkent district of Tashkent region,, at the 5th Regional Coordination Meeting of the republics of Central Asia and the Caucasus, organized by the International Organization of IKARDA (17-19 September, 2001).), at the regional seminar of the international FAO organization with the participation of the republics of Central Asia and the Caucasus in the Republic of Kazakhstan (20-22 February, 2002).), Ministry of Agriculture and water resources of the Republic of Uzbekistan, At the international scientific-practical conference "improvement of Agrotechnologies of care of porcine and winter wheat" organized by the scientific-production center of Agriculture and organizations of the International Atomic Energy Agency (IAEA-MAGATE) and held in Uzpiti (24-25 December, 2002).

On November 15-16, 2003, the International Organization of IKARDA organized a meeting on the theme "economic efficiency in farmer's farms" in Tashkent on the theme "use of effective methods in the management of water resources and soil fertility in Central Asia" on the development of Agriculture in the Central Asian republics on February 19-20, 2004 y, the state agency for land resources, At the IV Congress of the Society of soil scientists and agrochemists of Uzbekistan, organized by the State Institute of Soil science and agrochemistry, as well as organizations of the Society of soil scientists and agrochemists of Uzbekistan, the results of the experiment and production were introduced and approved. In addition, the Senate of the Supreme Assembly of the Republic of Uzbekistan and the legislative chambers jointly with the agrarian, Water Resources and ecology branches delivered a lecture at the scientific-practical conference organized on May 19, 2006 y. in the Supreme Assembly Senate.

Table 32

Growth, development and productivity of the cotton grown in short-turn crop rotation systems in production conditions

№	Name of farms	Area, ha	2:1, Winter wheat+beans: winter wheat +intermediate crop(rye) :cotton in the crop rotation system				1:1:1, Winter wheat+beans + intermediate crop (triticale): cotton + intermediate crop (triticale):bean in the crop rotation system				1:1:1 Winter wheat+beans: cotton + intermediate crop (tritikale):bean in the crop rotation system			
			Seedling thickness, thousand ha	Cotton heigh, sm.	Number of cocoons, piece	Cotton productivity, t/ha	Seedling thickness, thousand, h	Cotton heigh, sm.	Number of cocoons, piece	Cotton productivity, t/ha	Seedling thickness, thousand, ha	Cotton heigh, sm.	Number of cocoons, piece	Cotton productivity, t/ha
1	In the Tashkent region: Kibray districk K.Khojiev f/kh	12,0	-	-	-	-	97,0	92,6	12,3	3,12	94,3	95,8	14,1	3,28
	UzPITI Central Experimental plot	14,5	95,0	97,6	13,4	3,64	89,2	104,8	15,8	4,12	-	-	-	-
	"R.Ziyovuddinov" f/kh	13,0	-	-	-	-	91,3	96,5	13,7	3,55	96,1	95,4	12,1	3,34
2	In the Kashkadarya region: Kasbi districk "SH.Normuradova" f/kh	12,5	-	-	-	-	94,2	98,6	11,4	3,17	87,4	98,8	12,6	3,08
	SHahrisabz districk "Umida mother" f/kh	12,0	-	-	-	-	84,7	92,4	14,7	3,48	82,6	94,7	15,8	3,67
	Nishan districk i "Amudaryo" f/kh	13,0	-	-	-	-	87,1	90,3	12,1	3,07	82,4	83,7	12,3	2,93
	Kamashi districk "Samarkand" f/kh	18,0	-	-	-	-	91,1	94,7	13,5	3,27	91,0	91,3	12,1	3,13
3	In the Khorazm region: Gurlan districk «Cherkash» f/kh	13,0	-	-	-	-	84,1	90,3	12,0	2,95	88,0	94,5	12,2	3,11
	Khiva districk «Batrak» f/kh	11,0	-	-	-	-	89,7	92,6	11,4	3,06	85,0	91,4	13,3	3,25
	Urganch districk "Amir Temur" f/kh	12,0	-	-	-	-	91,5	88,3	11,2	2,98	90,7	94,8	12,4	3,07

CHAPTER V.

ALTERNATION OF SUGAR BEET PLANTING IN SHORT-TURN CROP SYSTEMS

The effect of crop rotation on the amount of nutrients in the soil

In order to obtain abundant and high-quality root fruit crop from sugar beet in the cond itions of typical gray soils of Tashkent region, an experiment was conducted to determine its planting thickness, the standard of mineral fertilizers and the requirement for irrigation procedures. According to preliminary data on the general forms of nutrients in the soil, 0-30 sm of the soil. The amount of humus in the layer was 0,940-0,850%, the total nitrogen content was 0,081-0,070%, phosphorus content was 0,151-0,136%, potassium content was 2,20-1,72%. According to the data obtained at the end of the validity period, it was observed that the experiment reduced the amount of humus and gross nitrogen in the soil in the options. It was found that the amount of humus decreased by 0,820% compared to the initial amount, and the amount of gross nitrogen by 0,067%. There was also a decrease in the amount of moving phosphorus and exchanging potassium (Table 33).

The results obtained at the beginning of the period of application (preliminary) on the moving forms of nutrients in the soil indicate that the nitrogen content in the soil is 0-30 sm. in the layer in 1993 3,5-4,5 mg/kg, in 1994 5,9-9,1 mg/kg, in 1995 5,3-7,0 mg/kg. made up. According to the data obtained at the end of the validity period, there was a decrease in the nitrogen content in the experiment options and soil layers. A relatively large reduction in nitrogen content was observed in options with a high irrigation order (table 34).

As you know, phosphorus is assimilated by microorganisms, moving from mineral composition to organic composition, that is to a state in which the plant can not absorb. As soon as the activity of microorganisms slows down, they again move from the organic composition to the state in which they absorb plants. The transition of phosphorus from one composition to the second depends on the type of soil, moisture content and air temperature.

Judging by the data obtained at the end of the period of validity of the experiment, it was not observed that the amount of moving phosphorus changed dramatically in terms of options. Only in the options (3,4,7,8-opt) where phosphorous fertilizers were used with a high standard, this indicator was slightly higher. In general, the amount of moving phosphorus by options (0-30 sm) 54,4-61,2 mg/kg. made up. At the end of the validity period, it was observed that in almost all options this indicator decreased, that is the studied values were affected. If the amount of phosphorus in a while is observed in the norm of mineral fertilizers NPK 150:105:75 kg/ha, the thickness of the seedlings to 90 thousand/ha, in the option with the irrigation procedure 70-70-65% (3-opt) (50,7 mg/ha), the same fertilizer norm and the thickness of the seedlings, in the order of high irrigation (75-75-70%), made up. And this means that in this option (7-th opt) the phosphorus is absorbed more by the plants due to the fact that moisture is sufficient (35-th table).

Naturally, the amount of exchangeable potassium in the soil will depend on the fertility, moisture, temperature of the soil and other external influences.

In almost all options of the experiment, it was observed that the amount of exchangeable potassium was higher in the spring. Potassium fertilizers 75 kg/ha in the options given the norm, regardless of the thickness of the plant seedlings and the irrigation procedure, the amount of potassium exchanged in the hay layer is to 262 mg/kg. from 265 mg/kg. it was observed that up. The procedure for irrigation (up to 50 kg/ha) and the subsistence of the thickness of the seedlings caused a decrease in this substance, while reducing the norm of potash fertilizer. But a relatively large decrease in potassium was noticeable in options with a high watering order.

The irrigation procedure is 70-70-65%, the norm of mineral fertilizers is NPK 150: 105: 75 kg/ha, when the planting thickness is 110 thousand/ha, the potassium content in the hay layer is 200 mg/kg. this indicator showed a relatively low amount of 755 mg/kg when applied the same fertilizer norm and a high watering procedure(75-75-70%) in the thickness of the seedling, if it was formed. It was also observed that the thickness of the plant seedlings also affected the amount of potassium in the soil. Regardless of the irrigation procedures and the norm of mineral fertilizers, when the thickness of the seedlings is 90 thousand/ha, the potassium content is 180 mg/kg., 110 mg/kg at 170 thousand/ha. made up. (Table 36).

It should be noted that at the end of the validity period, a sharp decrease in potassium was detected in the experimental options.

This can be explained by the fact that sugar beet consumes a lot of potassium in comparison with other mineral fertilizers, as well as slows down the activity of microorganisms due to a decrease in air temperature.

Similar data and the legislation on the results obtained were also observed in the study conducted in the conditions of barren soils of Kashkadarya region (tables 37, 38, 39, 40).

The study on determining the location of sugar beet in the alternation of sowing was carried out in the conditions of meadow-alluvial soils of the Khorezm region. Judging by the data obtained on the amount of nutrients in the general form in the soil in the systems of sowing by exchanging sugar beets, the initial amount of humus in the experimental field is 0-30 sm of the soil. the total amount of nitrogen was 0,060% and 0,050%, while the amount of phosphorus was 0,090%; 0,065% respectively.

Table 33

The effect of sugar beet cultivation on the total amount of nutrients in the soil (typical gray soils, Tashkent region)

№ Opt.	Soil layer, sm.	Initially indicators				1995 yr. (at the end of the validity period)			
		Humus, %	General form, %			Humus, %	General form, %		
			Nitrogen	Phosphours	Potassium		Nitrogen	Phosphours	Potassium
1	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,855 0,810	0,079 0,069	0,140 0,136	2,10 1,49
2	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,900 0,832	0,073 0,068	0,142 0,139	2,07 1,59
3	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,842 0,790	0,069 0,056	0,142 0,134	2,17 1,64
4	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,825 0,800	0,077 0,061	0,140 0,137	2,15 1,78
5	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,915 0,817	0,067 0,050	0,145 0,193	2,01 1,55
6	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,896 0,804	0,070 0,069	0,143 0,140	2,11 1,75
7	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,860 0,815	0,072 0,062	0,144 0,140	2,13 1,87
8	0-30 30-50	0,940 0,850	0,081 0,070	0,151 0,136	2,20 1,72	0,820 0,800	0,067 0,059	0,143 0,137	2,12 1,74

This can be explained by the fact that sugar beets consume more potassium than other fertilizers and the activity of microorganisms decreases due to lower temperatures.

Similar data and regularities in the results obtained were observed in a study conducted in the conditions of fertile soils of Kashkadarya region. (37, 38, 39, 40-tables).

The study to determine the role of sugar beet in crop rotation was conducted in the meadow-alluvial soils of Khorezm region. According to the data obtained on the amount of nutrients in the soil form sugar beet in crop rotation systems, the initial amount of humus in the experimental field is the soil 0-30 sm. for layer 0,641%, for layer under the hood 0,517%, total nitrogen content 0,060% and 0,050%, amount of phosphours 0,090; 0,065% in formed.

Table 34

Nitrogen content in the soil, mg/kg.
(Tashkent region, typical gray soils)

№ Opt.	Soil layer, sm.	1993 year		1994 year		1995 year	
		At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period
1	0-30	3,5	5,7	5,9	6,3	5,3	5,7
	30-50	2,2	1,8	2,6	3,5	4,1	3,0
	50-70	1,5	1,4	2,4	2,0	2,5	3,0
2	0-30	3,0	5,5	5,5	5,9	5,0	5,0
	30-50	2,1	1,2	2,9	4,1	3,9	3,2
	50-70	2,8	1,0	2,0	1,2	2,0	3,0
3	0-30	4,5	6,3	8,5	6,8	6,2	6,7
	30-50	3,1	1,2	4,2	6,3	4,7	3,4
	50-70	2,2	1,0	3,3	2,1	3,0	3,3
4	0-30	4,2	6,2	7,2	6,3	6,7	6,0
	30-50	3,2	1,1	4,6	4,1	4,0	3,4
	50-70	2,3	0,9	2,3	2,7	2,1	3,0
5	0-30	3,6	5,3	7,8	4,9	6,0	4,5
	30-50	3,2	1,0	4,6	4,9	3,8	2,9
	50-70	2,3	0,8	3,9	4,3	1,7	2,7
6	0-30	3,6	5,0	8,4	3,7	6,9	4,3
	30-50	3,0	1,3	3,3	2,9	4,8	3,0
	50-70	2,5	0,8	3,3	2,4	3,3	2,8
7	0-30	3,8	5,5	9,1	4,8	7,0	5,4
	30-50	3,6	1,7	5,3	2,9	4,6	2,6
	50-70	2,9	1,4	4,8	2,7	2,7	2,4
8	0-30	3,8	4,8	7,5	3,2	6,8	5,0
	30-50	3,5	2,0	4,8	3,1	4,7	3,0
	50-70	2,6	2,4	3,3	2,7	2,9	2,6

Table 35

The amount of moving phosphorus in the soil, mg/kg.
(Tashkent region, typical gray soils)

№ Opt.	Soil layer, sm.	1993 year		1994 year		1995 year	
		At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period
1	0-30 30-50 50-70	52,5 36,4 12,4	49,1 31,4 14,4	45,5 35,7 18,2	42,0 30,2 17,4	54,4 40,6 16,4	49,6 31,5 19,7
2	0-30 30-50 50-70	53,4 39,8 13,6	48,0 39,2 14,4	45,0 34,0 17,5	41,2 30,8 16,9	54,7 40,3 20,4	49,7 30,5 20,1
3	0-30 30-50 50-70	57,0 38,8 12,4	50,4 35,4 12,0	46,2 34,9 18,0	41,3 30,9 17,0	58,7 48,3 24,4	50,7 37,6 22,3
4	0-30 30-50 50-70	57,5 39,1 14,8	49,3 36,0 11,2	47,6 34,4 18,2	40,2 27,0 18,2	60,6 43,7 20,3	50,3 35,7 18,7
5	0-30 30-50 50-70	65,4 37,0 16,0	50,1 39,2 17,6	46,0 36,2 18,3	40,2 28,4 15,6	55,7 38,6 17,2	47,3 30,4 16,7
6	0-30 30-50 50-70	56,3 38,5 17,7	49,3 30,1 17,3	47,5 34,9 18,5	39,4 31,4 14,8	57,7 38,3 17,0	49,8 34,5 15,6
7	0-30 30-50 50-70	58,1 36,3 14,8	48,4 31,4 13,6	48,5 30,2 21,4	40,0 38,8 18,6	61,2 41,3 18,1	43,4 35,4 20,3
8	0-30 30-50 50-70	58,4 37,4 19,3	48,7 36,0 14,0	48,0 40,7 22,4	39,2 37,8 19,6	60,4 47,6 19,2	48,3 37,4 17,4

Table 36

The amount of exchangeable potassium in the soil, mg/kg.
(Tashkent region, typical gray soils)

№ Opt.	Soil layer, sm.	1993 year		1994 year		1995 year	
		At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period
1	0-30	260,0	170,0	250,0	180,0	270,0	160,0
	30-50	230,0	160,0	236,0	160,0	240,0	155,0
	50-70	221,5	150,0	229,0	160,0	210,0	130,0
2	0-30	267,0	160,0	254,0	170,0	268,0	155,0
	30-50	235,8	150,0	233,0	150,0	240,0	140,0
	50-70	221,0	140,0	229,0	140,0	230,0	120,0
3	0-30	270,0	190,0	262,0	180,0	280,0	170,0
	30-50	255,0	150,0	243,0	170,0	250,0	150,0
	50-70	224,5	140,0	224,0	150,0	230,0	120,0
4	0-30	271,0	170,0	263,0	180,0	278,0	160,0
	30-50	258,0	160,0	246,0	170,0	259,0	150,0
	50-70	228,0	150,0	220,0	150,0	230,0	110,0
5	0-30	258,5	160,0	240,5	170,0	270,0	150,0
	30-50	236,0	150,0	240,0	160,0	237,0	140,0
	50-70	223,0	130,0	210,0	150,0	210,0	130,0
6	0-30	252,5	150,0	253,0	160,0	267,0	140,0
	30-50	234,0	150,0	238,0	150,0	238,0	135,0
	50-70	219,0	140,0	200,0	150,0	210,0	120,0
7	0-30	268,0	160,0	258,0	160,0	270,0	150,0
	30-50	251,0	140,0	248,0	150,0	240,0	140,0
	50-70	220,0	130,0	200,0	140,0	230,0	130,0
8	0-30	270,0	150,0	265,0	150,0	280,0	150,0
	30-50	250,0	140,0	246,0	140,0	240,0	140,0
	50-70	215,0	130,0	200,0	130,0	220,0	120,0

Table 37

The effect of sugar beet cultivation on the total amount of nutrients in the soil.
(Kashkadarya region, fertile soils)

Standart of fertilizers, NPK, kg/ha	Options	Seedling thickness, thousand/ha	Rotten, %		Gross amount, %			
					Nitrogen		Phosphorus	
			0-30	30-50	0-30	30-50	0-30	30-50
Initial amount, %			0,942	0,865	0,074	0,053	0,220	0,190
1993 year 70-70-70%								
100 75 50	1	86,6	0,818	0,734	0,048	0,048	0,159	0,147
	2	108,0	0,817	0,760	0,047	0,042	0,157	0,143
150 105 75	3	87,9	0,828	0,700	0,059	0,044	0,152	0,148
	4	107,0	0,825	0,750	0,049	0,045	0,149	0,150
75-75-75%								
100 75 50	5	88,0	0,818	0,760	0,035	0,098	0,158	0,155
	6	107,7	0,810	0,740	0,039	0,022	0,150	0,151
150 105 75	7	88,6	0,822	0,750	0,030	0,036	0,152	0,159
	8	108,6	0,815	0,730	0,042	0,034	0,147	0,153
1994 year 70-70-70%								
100 75 50	1	88,0	0,936	0,835	0,066	0,053	0,165	0,160
	2	107,4	0,936	0,805	0,062	0,051	0,164	0,154
150 105 75	3	88,9	0,943	0,835	0,072	0,058	0,167	0,154
	4	108,7	0,936	0,825	0,072	0,072	0,054	0,150
75-75-75%								
100 75 50	5	89,0	0,947	0,635	0,061	0,050	0,164	0,152
	6	108,0	0,926	0,805	0,060	0,049	0,161	0,150
150 105 75	7	89,8	0,939	0,839	0,069	0,054	0,165	0,150
	8	108,8	0,937	0,825	0,066	0,054	0,161	0,150
1995 year 75-75-75%								
100 75 50	1	87,0	0,815	0,737	0,047	0,039	0,155	0,143
	2	105,4	0,811	0,728	0,046	0,038	0,155	0,143
150 105 75	3	87,6	0,845	0,780	0,052	0,041	0,166	0,148
	4	108,0	0,320	0,783	0,048	0,041	0,163	0,148
100 75 50	5	87,5	0,817	0,743	0,038	0,035	0,150	0,153
	6	107,0	0,813	0,743	0,037	0,033	0,150	0,150
150 105 75	7	87,8	0,841	0,078	0,041	0,037	0,163	0,161
	8	107,5	0,838	0,773	0,040	0,036	0,162	0,160

Table 38

Dynamics nitrate nitrogen in soil, mg/kg.
(Kashkadarya region, fertile soils)

Opt.	Soil layer, sm.	1993 year			1994 year			1995 year		
		8.05	15.07	15.10	14.05	20.07	12.10	12.05	22.07	10.10
1	0-30	3,6	37,4	4,0	5,4	38,0	3,8	4,3	40,3	3,4
	30-50	2,9	15,4	2,1	3,0	16,3	2,9	3,0	18,1	2,8
	50-70	1,2	4,5	1,0	2,3	7,1	2,1	2,2	9,1	2,0
2	0-30	4,3	35,5	3,6	5,6	37,7	3,0	4,7	39,3	2,8
	30-50	2,7	14,7	2,0	3,6	15,1	2,0	2,9	16,7	2,0
	50-70	1,2	3,1	1,1	1,1	4,0	1,3	1,3	7,7	1,7
3	0-30	4,3	39,4	4,4	4,9	41,4	4,4	4,1	43,3	3,4
	30-50	2,9	17,3	2,8	3,4	18,4	3,3	2,7	19,1	2,9
	50-70	2,1	3,9	2,3	2,1	6,3	2,3	1,3	6,4	2,0
4	0-30	4,9	38,1	3,8	5,3	41,0	3,7	4,0	43,0	3,3
	30-50	2,1	16,4	2,4	3,1	17,8	2,4	2,4	18,7	2,5
	50-70	1,9	3,4	2,0	2,0	6,0	2,3	1,4	5,9	2,1
5	0-30	4,8	38,1	4,0	4,6	39,1	4,1	4,1	40,0	3,6
	30-50	2,7	19,4	2,6	3,1	19,3	3,7	2,7	15,7	2,9
	50-70	1,8	6,1	1,7	2,0	5,9	2,1	1,1	6,1	1,4
6	0-30	4,9	36,1	3,9	5,6	37,1	3,3	4,9	37,4	3,3
	30-50	3,1	15,4	3,3	3,0	14,1	2,9	2,7	17,8	2,9
	50-70	2,1	7,1	2,4	2,4	6,9	2,5	1,3	6,1	1,4
7	0-30	4,4	40,1	4,6	4,6	42,1	5,8	4,1	40,3	4,4
	30-50	3,5	19,4	3,7	3,8	21,1	3,3	18,7	18,7	3,3
	50-70	2,2	6,4	2,3	2,7	7,7	2,1	2,0	7,1	2,7
8	0-30	4,7	38,1	4,1	5,8	38,1	4,0	4,2	38,1	3,4
	30-50	2,8	20,4	2,7	3,7	19,7	3,7	3,7	19,3	2,9
	50-70	1,4	5,4	1,9	2,0	6,3	1,9	1,9	6,7	1,3

Table 39

Dynamics of moving phosphorus in the soil, mg / kg.
(Kashkadarya region, fertile soils)

Opt.	Soil layer, sm.	1993 year			1994 year			1995 year		
		8.05	15.07	15.10	14.05	20.07	12.10	12.05	22.07	10.10
1	0-30	21,3	31,4	15,0	24,6	34,4	14,1	19,7	33,5	14,1
	30-50	15,1	22,3	14,1	15,4	18,3	12,9	15,1	24,4	12,3
	50-70	12,4	14,4	12,0	11,1	12,4	11,3	12,4	18,1	12,2
2	0-30	21,1	28,4	14,0	23,0	29,7	13,9	20,5	31,7	13,3
	30-50	14,9	23,4	13,4	16,1	24,7	12,2	14,9	24,4	11,1
	50-70	11,4	15,7	11,1	12,3	17,4	12,0	12,4	14,4	11,9
3	0-30	21,5	32,8	15,8	20,1	35,5	15,1	23,9	37,1	14,9
	30-50	16,6	25,7	14,4	16,6	24,4	15,5	10,4	26,1	13,2
	50-70	13,1	14,8	12,1	11,4	16,1	11,1	13,2	17,1	11,0
4	0-30	20,9	33,7	14,4	21,3	31,3	14,1	19,5	32,7	15,4
	30-50	17,1	25,4	13,1	14,9	26,1	11,4	16,8	28,8	11,4
	50-70	13,1	14,7	18,6	11,4	13,9	11,0	11,4	12,8	10,9
5	0-30	21,5	29,7	16,4	22,4	30,1	15,4	20,1	28,8	14,4
	30-50	17,4	24,1	14,7	15,9	26,1	14,7	13,6	25,7	14,2
	50-70	13,1	15,1	12,1	12,1	14,1	12,0	11,7	13,3	10,7
6	0-30	20,1	30,7	15,9	20,4	29,1	14,4	19,0	29,7	13,9
	30-50	16,1	24,1	13,7	15,6	29,7	12,4	15,6	25,7	13,1
	50-70	12,2	16,1	11,1	12,4	14,4	10,7	12,7	15,2	10,0
7	0-30	22,1	32,4	16,4	23,6	35,3	16,1	20,1	34,4	17,7
	30-50	17,4	26,7	14,5	14,7	23,1	12,1	17,1	27,0	14,1
	50-70	11,3	14,7	11,1	12,3	15,3	12,0	13,2	14,4	12,9
8	0-30	21,7	33,8	16,4	23,7	36,1	15,7	21,0	35,3	15,1
	30-50	17,3	28,1	15,2	15,7	24,9	12,1	15,3	25,3	14,4
	50-70	15,0	16,1	11,2	11,4	15,5	10,9	14,6	16,3	11,3

40-table

Dynamics of replaceable potassium in the soil, mg / kg.
(Kashkadarya region, fertile soils)

Opt.	Soil layer, sm.	1993 year			1994 year			1995 year		
		8.05	15.07	15.10	14.05	20.07	12.10	12.05	22.07	10.10
1	0-30	218,0	182,0	150,0	222,0	184,0	160,0	217,0	175,0	140,0
	30-50	207,0	160,0	134,0	210,0	165,0	130,0	202,0	150,0	120,0
	50-70	190,0	168,0	140,0	192,0	169,0	138,0	188,0	158,0	120,0
2	0-30	220,0	178,0	135,0	215,0	175,0	140,0	224,0	175,0	135,0
	30-50	200,0	150,0	120,0	190,0	150,0	130,0	188,0	150,0	125,0
	50-70	180,0	152,0	125,0	180,0	145,0	120,0	175,0	145,0	124,0
3	0-30	219,0	170,0	145,0	224,0	182,0	145,0	215,0	165,0	135,0
	30-50	195,0	150,0	125,0	200,0	150,0	125,0	185,0	140,0	115,0
	50-70	180,0	150,0	120,0	180,0	160,0	130,0	170,0	150,0	125,0
4	0-30	220,0	160,0	140,0	227,0	180,0	135,0	210,0	160,0	125,0
	30-50	195,0	160,0	120,0	208,0	150,0	135,0	175,0	140,0	110,0
	50-70	179,0	150,0	115,0	180,	150,0	110,0	160,0	130,0	100,0
5	0-30	225,0	185,0	150,0	220,0	190,0	165,0	218,0	180,0	145,0
	30-50	190,0	170,0	147,0	195,0	177,0	148,0	135,0	172,0	135,0
	50-70	170,0	145.0	120,0	170,0	140,0	120,0	165,0	135,0	103,0
6	0-30	218,0	183,0	145,0	215,0	180,0	145,0	220,0	180,0	140,0
	30-50	185,0	160,0	138,0	180,0	150,0	128,0	184,0	157,0	125,0
	50-70	165,0	130,0	105,0	160,0	134,0	105,0	165,0	130,0	110,0
7	0-30	225,0	185,0	150,0	224,0	190,0	160,0	216,0	175,0	145,0
	30-50	190,0	160,0	130,0	178,0	170,0	145,0	175,0	140,0	130,0
	50-70	160,0	125,0	100,0	150,0	124,0	104,0	145,0	125,0	100,0
8	0-30	228,0	180,0	150,0	224,0	185,0	140,0	218,0	170,0	130,0
	30-50	195,0	160,0	130,0	180,0	175,0	125,0	180,0	145,0	114,0
	50-70	170,0	150,0	115,0	160,0	135,0	100,0	155,0	135,0	108,0

According to the data obtained at the end of the rotation of short-turnable planting systems, it was observed that the experiment maintained the initial state of the amount of nutrients in the soil in the 2 alfalfa : 1 sugar beet : 1 bean: 2 cotton 6-field turntable planting system. The amount of humus in this was 0,637%, the amount of gross nitrogen was 0,055%. In the remaining systems of the experiment, it was observed that the amount of humus decreased by 0,025-0,055%, and the amount of gross nitrogen by 0,009-0,023%. It was observed that even in the options with the addition of legume-grain bean to crop rotation systems, the amount of humus and nitrogen in the soil was relatively preserved (table 41).

The initial amount of nitratli nitrogen in this soil is 0-30 sm of soil, in layer 22,3 mg/kg, 18,2 mg/kg in the underground layer of the amount of moving phosphorus is 17,9-10,6 mg/kg respectively made up.

Although the recommended standard of mineral fertilizers was used in the care of these crops, the amount of nitratli nitrogen contained in the soil after the first three years (2002 year, Autumn) is 18,1 mg/kg., the amount of moving phosphorus is 18,6 mg/kg. in the fall of 2005, these indicators bean a lower result, respectively, they were 10,3, 14,3 mg/kg; 18,4, 15,6 mg/kg; 19,6, 16,3 mg/kg.

The cultivation of legumes and legumes-cereals in the systems of exchange of experience has had a positive effect on the amount of active nutrients in the soil. Sharing planting 1:1:1:1:2 (1winter wheat: 1sugar beet: 1bean: 1winter wheat: 2winter wheat) in the system the nitrogen content of nitrate after the bean is 25,6 mg/kg., the amount of moving phosphorus is 24,5 mg/kg. 2: 1: 1: 2 (2alfalfa: 1sugar beet: 1bean: 2cotton) in the alternation planting system, the indicators obtained in autumn after two years of alfalfa increased nitrogen content of nitratli, even after that sugar beet planted, respectively 28,1; 27,1 mg/kg it was determined that. In this system, both in 2005 year and at the end of the validity period, the amount of nitratli nitrogen and actionable phosphorus is higher than the initial figure 23,4; 22,6 mg/kg it was observed that. In both 4 and 8-th options of the experiment, these indications are close to the initial amount-19,6; 20,1 mg/kg. (4-opt) and 17,2; 14,3 mg/kg. It was quail to (8-opt). (table 42)

Table 41

**Change in the amount of nutrients in the soil in crop rotation systems, %
(Meadow-alluvial soils, Khorezm region)**

№ Opt.	Years						2000 yr. (Initial indicators)				2005 yr. (at the end of the rotation)			
	2000	2001	2002	2003	2004	2005	Soil layer, sm.	Humus	N	P	Humus	N	P	K
1	Sugar beet	-//-	-//-	-//-	-//-	-//	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,532 0,475	0,037 0,030	0,077 0,053	- -
2	Cotton	-//-	-//-	-//-	-//-	-//-	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,584 0,494	0,040 0,034	0,080 0,060	- -
3	Winter wheat	-//-	-//-	-//-	-//-	-//-	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,602 0,511	0,042 0,040	0,082 0,064	- -
4	Winter wheat	Sugar beet	Soy bean	Winter wheat	Cotton	Cotton	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,617 0,509	0,051 0,044	0,085 0,060	- -
5	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,637 0,525	0,055 0,050	0,094 0,069	- -
6	Soy bean	Sugar beet	Cotton	Cotton	Winter wheat	Cotton	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,600 0,498	0,046 0,038	0,085 0,064	- -
7	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,597 0,490	0,045 0,040	0,085 0,060	- -
8	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton	0-30 30-50	0,641 0,517	0,060 0,050	0,090 0,065	0,615 0,513	0,047 0,041	0,087 0,060	- -

Table 42

Effect of soil on active nutrients when planting sugar beet alternately. (Meadow-alluvial soils, Khorezm region) preliminary indicators, 2000 year, spring

Options	Soil layer,sm.	Nitrate nitrogen, mg/kg.	Mobile phosphorus, mg/kg.	Exchangeable potassium, mg/kg.
	0-30	22,3	17,9	-
	30-50	18,2	10,6	-
2002 year,autumn				
1	0-30	18,1	18,6	-
	30-50	13,1	15,5	-
2	0-30	-	-	-
	30-50	-	-	-
3	0-30	-	-	-
	30-50	-	-	-
4	0-30	25,6	24,5	-
	30-50	16,3	14,6	-
5	0-30	28,1	27,1	-
	30-50	19,3	21,8	-
6	0-30	16,3	13,6	-
	30-50	12,5	9,7	-
7	0-30	15,5	14,5	-
	30-50	11,4	10,3	-
8	0-30	17,5	15,4	-
	30-50	11,2	10,1	
2005 year,autumn				
1	0-30	10,3	14,3	-
	30-50	6,4	5,4	-
2	0-30	18,4	15,6	-
	30-50	14,3	8,7	-
3	0-30	19,6	16,3	-
	30-50	16,3	9,7	-
4	0-30	19,6	20,1	-
	30-50	13,7	16,4	-
5	0-30	23,4	22,6	-
	30-50	19,6	10,1	-
6	0-30	14,7	10,6	-
	30-50	9,7	5,4	-
7	0-30	10,7	10,0	-
	30-50	6,4	5,4	-
8	0-30	17,2	14,3	-
	30-50	10,1	8,3	-

Proceeding from the above information, it can be concluded that the cultivation of legumes (alfalfa) and legumes (bean) crops before and after sugar beet in the systems of sugar beet alternation mainatains a balance of the amount of total and active nutrients in the soil and does not adversely effect the yield of agricultural crops cultivated in this system.

Mastering the nutritional modes of sugar beet

Sugar beet plant does not absorb the same amount of mineral fertilizer.According to M.A.Belousov (1947), the plant becomes more demanding first of all to potassium, nitrogen, then phosphorus elements. Therefore, together with the soil, it absorbs magnesium, sulfur, iron, boron, manganese and other microelements.

Sugar beet begins to absorb nitrogen and phosphorus in the soil, mainly in late July. Therefore, the feeding of sugar beets with nitrogen fertilizers at the end of July and early August will ensure a high yield of root fruit. During the period of validity of sugar beet was brought to the dynamics 43 and 44-tables of mine fertilization.

Table 43

Sugar beet absorbs nutrients
(Data from M.A.Belousov)

Root yield, t/ha	Assimilation of mineral fertilizers, kg/ha.		
	N	P_2O_5	K_2O
30,0	119,0	43,0	189,0
50,0	212,0	51,0	334,0
100,0	390,0	120,0	760,0

The data obtained on the assimilation of sugar beet fertilizers from above were also confirmed in the research conducted on typical gray soils of the Tashkent region.

Table 44

Dynamics of mine fertilization during the period of validity of sugar beet (Data from M.A.Belousov)

Observation periods	Dry matter mass, t/ha		Assimilation of root crops, kg/h		Assimilation rate, %		Assimilation of leaf fertilizers, kg/ha		Assimilation rate, %		Total amount of fertilizers, kg/ha		Assimilation rate, %	
	Root fruit	Leaf	N	P_2O_5	N	P_2O_5	N	P_2O_5	N	P_2O_5	N	P_2O_5	N	P_2O_5
10. 06	0,36	0,66	4,8	1,7	3,2	3,7	24,3	4,9	19,5	18,6	29,1	6,60	12,8	11,0
30. 06	2,62	2,69	30,4	13,4	20,1	29,1	82,4	15,0	66,2	59,3	112,8	28,4	49,7	47,4
12. 07	5,63	4,0	65,6	20,8	43,4	64,8	120,0	24,7	96,1	94,1	185,6	54,6	81,8	91,0
25. 07	6,26	4,61	81,3	30,6	53,7	66,5	124,7	26,3	100,0	100,0	206,0	56,9	91,0	95,3
14. 08	7,74	4,15	80,5	29,8	53,2	64,8	107,0	23,0	85,7	87,6	187,5	52,8	82,6	88,1
31. 08	9,14	3,84	113,9	32,9	75,4	71,5	91,0	17,8	73,0	67,7	204,9	50,7	90,4	84,5
18. 09	12,78	3,71	132,7	43,4	87,7	94,4	83,4	16,4	66,7	62,4	216,1	59,8	95,6	100,0
3. 10	1,62	3,14	151,2	46,0	100,0	100,0	75,6	13,2	60,6	50,2	226,8	59,2	100,0	99,0

The amount of nutrients contained in sugar beets

In terms of relatively greater assimilation of nutrients in the soil among plants, tuberose plants are in high place, and thus sugar beets are also among the plants. According to the data obtained on the amount of nutrients contained in sugar beets, nitrogen in the leaf portion of sugar beet, depending on the order of irrigation and the norm of mineral fertilizers.

In the amount of 2,62-2,80%, in the composition of root fruit 0,67-0,83%, in the amount of phosphorus 0,69-0,79% in the leaf, in root fruit 0,26-0,39%, in the amount of potassium 2,80-3,90% in the leaf, in the part of root fruit 0,95-1,30%. (Table 45)

According to the data obtained by sugar beet on the assimilation of nutrients in the soil, the amount of assimilation depends on the amount of productivity grown, the consumption of nutrients spent on the formation of a ton of sugar beet root crops with a high irrigation regime and the standard of mineral fertilizers was also high. The irrigation mode of the study is 70-70-65 kg for a ton of root fruit in options with 3,39-3,95%. nitrogen, 1,16-1,46 kg. phosphorus, 4,61-5,72 kg. if potassium substances are assimilated, then in options with an irrigation regime 75-75-70%, these indicators are slightly higher, nitrogen 3,82-4,41 kg, phosphorus 1,39-1,78 kg, potassium 5,03-6,69 kg. that it was determined. These legislations were also observed in the options used in the mine oghuz higher standard. In the order of high irrigation (75-75-70%), the normative support of the mine oghuz to 150:105:75 kg/ha, sugar beet is 4,41 kg for a ton of root crops in the care options. Nitrogen 1,74-1,78 kg. and phosphorus 6,45-6,69 kg. if potassium is assimilated, then in the option where the mineral oghuz is used in the norm to 100:75:50 kg/ha, respectively, 3,82-3,78 kg. N, 1,39-1,40 kg. P_2O_5, 5,03-5,10 kg. It was determined that the substance K_2O was assimilated (table 46).

Proceeding from the above information, it can be concluded that the assimilation of sugar beet with nutrients in the soil directly depends on the thickness of its seedlings as well as on the order of irrigation.

Table 45

The amount of nutrients contained in sugar beets
(Tashkent region, typical gray soils)

№ Opt.	Seedling thickness,thousand /ha	CHDNS relative irrigation regime, %	The amount of nutrients, %					
			N		P		K	
			In the leaf	In the root fruit	In the leaf	In the root fruit	In the leaf	In the root fruit
NRK 100:75:50 kg/ha								
1	60x18x1	70-70-65	2,67	0,67	0,71	0,27	3,40	0,95
2	60x15x1	-//-	2,62	0,61	0,69	0,26	2,80	1,10
NRK 150:105:75 kg/ha								
3	60x18x1	-//-	2,72	0,80	0,77	0,35	3,70	1,15
4	60x15x1	-//-	2,69	0,77	0,75	0,34	3,50	1,20
NRK 100:75:50 kg/ha								
5	60x18x1	75-75-70	2,70	0,78	0,76	0,33	3,45	1,05
6	60x15x1	-//-	2,67	0,74	0,74	0,34	3,60	1,05
NRK 150:105:75 kg/ha								
7	60x18x1	-//-	2,80	0,83	0,79	0,39	3,90	1,25
8	60x15x1	-//-	2,77	0,81	0,78	0,37	3,80	1,30

Table 46

Assimilation of nutrients by sugar beet
(Tashkent region, typical gray soils)

№ opt.	Seedling thickness,thousand/ha	CHDNS relative irrigation regime, %	Root yield t/ha	Ammount of assimilation					
				kg/ha			kg/ t		
				N	P	K	N	P	K
NRK 100:75:50 kg/ha									
1	60x18x1	70-70-65	39,95	135,8	45,5	184,1	3,39	1,16	4,61
2	60x15x1	-//-	41,44	143,0	49,7	207,5	3,45	1,19	5,00
NRK 150:105:75 kg/ha									
3	60x18x1	-//-	45,73	179,0	66,5	251,7	3,91	1,45	5,50
4	60x15x1	-//-	47,73	189,0	69,8	273,2	3,95	1,46	5,72
NRK 100:75:50 kg/ha									
5	60x18x1	75-75-70	45,02	172,0	62,6	226,7	3,82	1,39	5,03
6	60x15x1	-//-	47,13	178,5	66,0	240,6	3,78	1,40	5,10
NRK 150:105:75 kg/ha									
7	60x18x1	-//-	52,14	230,2	90,8	336,4	4,41	1,74	6,45
8	60x15x1	-//-	54,51	240,6	97,5	365,1	4,41	1,78	6,69

Influence on the activity of microorganisms in the soil

It is known that in the life of plants, their growth, development and yield at this or that level are related to the number and activity of microorganisms in the soil. According to the results of the experiment conducted on the study of the order of irrigation of sugar beets in the fields of the Central experimental farm of the Scientific Research Institute of cotton growing of Uzbekistan (now the Scientific Research Institute of Agrotechnologies of cotton selection, seed growing and cultivation) and the requirement for the norm of mineral fertilizers, it was observed that the for example, when the norm of mineral fertilizers is NPK 100:75:50 kg/ha MPA the number of bacteria in the environment correspondingly over the years of the experiment 2,2-2,4-4,2 million/piece, number of fung in the environment 0,30-0,30-0,15 mln/piece, actinomycets 0,10-0,15-0,20 mln/piece the number of, nitrifiers amounted to 10^5-10^4-10^6 mln/piece.Apparently, the high content of the norm of mineral fertilizers causes an increase in the number of microorganisms in the soil.

It was also observed that the order of irrigation also affected the number of microorganisms in the soil. The number of fung in the maple environment in the option with a high watering order 75-75-70% by years 0,25-0,25-0,10 mln/piece in the case of an option with a watering order of 70-70-65%, if the amount of 0,30-0,30-0,15 mln/piece made up. Such legislation was also observed in terms of the number of actinomycetes and nitrifiers. Only by the number of bacteria in the MPA were high irrigation procedures and indicators in the norm of mineral fertilizers (Table 47).

In summary, the high level of irrigation procedures in the cultivation of sugar beets also does not affect much the beneficial activity of microorganisms in the soil. But the increase in the norm of mineral fertilizers has a positive effect on the functioning of microorganisms in the soil.

Table 47

Microbiological changes in soil
(Tashkent region, typical gray soils)

Options	CHDNS relative irrigation regime,%	MPA number of bacteria, mln.			CHapek the number of fungi in the environment, mln.			Amount of actinomycetes, mln.			Nitrifiers, mln.		
		1993 year	1994 year	1995 year	1993 year	1994 year	1995 year	1993 year	1994 year	1995 year	1993 year	1994 year	1995 year
		20.IX	18.IX	4.IX	20.IX	18.IX	4.IX	20.IX	18.IX	4.IX	20.IX	18.IX	4.IX
NRK 100:75:50 kg/ha													
2	70-70-65	2,2	2,4	4,2	0,20	0,22	0,15	0,05	0,10	0,15	10^4	10^3	10^5
NRK 150:105:75 kg/ha													
4	70-70-65	3,7	5,5	5,7	0,30	0,30	0,15	0,10	0,15	0,20	10^5	10^4	10^6
NRK 100:75:50 kg/ha													
6	75-75-70	2,3	5,2	5,3	0,15	0,20	0,05	-	0,10	0,05	10^3	10^5	10^3
NRK 150:105:75 kg/ha													
8	75-75-70	3,8	6,1	6,5	0,25	0,25	0,10	0,05	0,10	0,10	10^4	10^4	10^4

Agrotechnical measures and the effect of crop rotation on the thickness of sugar beet seedlings

According to the data obtained on the planting thickness of mineral fertilizers and irrigation procedures in the care of sugar beet in the typical gray soils of Tashkent region, at the end of the operational period, when the irrigation procedure was 70-70-65%, the norm of mineral fertilizers was NPK 100:75:50 kg/ha and NPK 150:105:75 kg/ha, when In the same mine fertilizer norm, in the order of high irrigation (75-75-70%) this figure is 88,7-88,8 thousand/ha. made up. It was determined that the thickness of the seedlings at the end of the valid period was 107,3-108,3 thousand/ha, respectively, when the thickness of the seedlings in the same irrigation procedures and mine fertilizers was 110 thousand/ha.

It should be noted that the relative destruction of sugar beets was observed in options with a seedling thickness of 110 thousand/ha. If the irrigation procedure was 70-70-65%, the plant death rate in the norm of both mineral fertilizers was 1,9-2,5%, in the high irrigation procedure, it was determined that this indicator was 1,5-1,6% in a relatively small amount.

Although the death of plants was observed slightly less often when the thickness was 90 thousand piece per hectare, the fact that the irrigation procedure was 70-70-65% caused the death of plants in the amount of 1,8-2,3%. (Table 48).

In the research conducted in the conditions of bald soils of Kashkadarya region, it was also found out that at the end of the period of application of seedling thickness in plants was an average of 86-87; 106-108 thousand piece/ha, and in the average of 2-4 thousand seedlings perished. Large indicators in this regard were observed in options with a seedling thickness of 110 thousand/ha, the norm of mineral fertilizers is N_{100} R_{75} K_{50} kg/ha and the irrigation procedure is 70-70% compared to CHDNS 3,8 thousand/ha. And the lower figure was determined in the 3-th option of the experiment 2,0 thousand/ha (table 49).

In the research conducted on crop rotation systems in the conditions of meadow-alluvial soils of the Khorezm region, the planting thickness of sugar beets was uniform at the beginning of the validity period, leaving 90 thousand/ha.

Table 48

Planting thickness of sugar beet
(Typical gray soils, Tashkent region)

Plant placement system	Theoretical seedling thickness at the beginning of the application period, thousand/ha	The actual seedling thickness at the end of the application period thousand/ha	In an average of three years	The number of dead plants, thousand/ha, %
		1993 : 1994 : 1995		
70-70-65%, NPK 100:75:50 kg/ha				
60x18-1	90,0	88,6:86,3:88,9	87,9	2,1/2,3
60x15-1	110,0	108,4:107,1:107,5	107,3	2,7/2,5
NPK 150:105:75 kg/ha				
60x18-1	90,0	88,9 :87,8: 88,2	88,4	1,6/1,8
60x15-1	110,0	108,8:108,6:107,0	107,9	2,1/1,9
75-75-70%, NPK 100:75:50 kg/ha				
60x18-1	90,0	89,1: 88,1:88,7	88,7	1,3/1,4
60x15-1	110,0	108,0:108,7:108,2	108,3	1,7/1,6
NPK 150:105:75 kg/ha				
60x18-1	90,0	89,1:88,1:89,4	88,8	1,2/1,3
60x15-1	110,0	108,7:107,8:108,6	108,3	1,7/1,5

Table 49

Thickness of seedlings in conditions of sugar beet loamy soils
(Loamy soils, Kashkadarya region)

Options	Soil maisture, %	Norm of mineral fertilizers, kg/ha	Specified seedling thickness thousand /ha	Seedling thickness at the end of the application period thousand/h			In an average of three years
				1993 year	1994 year	1995 year	
1	70-70-70	N_{100} R_{75} K_{50}	90,0	86,6	88,0	87,0	87,2
2	-//-	-//-	110,0	106,0	107,4	105,4	106,2
3	-//-	N_{150} R_{105} K_{75}	90,0	87,9	86,9	87,6	87,4
4	-//-	-//-	110,0	107,0	108,7	108,0	107,9
5	75-75-75	N_{100} R_{75} K_{50}	90,0	88,0	88,0	87,5	87,8
6	-//-	-//-	110,0	107,7	108,0	107,0	107,5
7	-//-	N_{150} R_{105} K_{75}	90,0	88,6	87,8	87,8	88,0
8	-//-	-//-	110,0	108,6	108,8	107,5	108,3

According to the data obtained, if the seedling thickness of sugar beets was 76,3 thousand/ha at the end of the first year's validity period in the control option of the experiment, then in the following years it was observed that this indicator decreased sharply. It was noted that at the end of the 5 and 6 years of the experiment the seedling thickness decreased by 30-31 thousand grains per hectare compared to the number of at the beginning of the validity period.

Sugar beets 1winter wheat : 1 sugar beet : 1bean : 1 winter wheat : 2 cotton and 1 : 1 sugar beet : 1 winter wheat : 1 bean : 2 cotton seedlings planted after winter wheat seeding in the system when its available per hectare as compared to the beginning of the period the thickness of 9,4-10,7 thousand/piece into 2 alfalfa : 1sugar beets : 1bean : 2 2,6 thousand pieces per hectare cotton into crop planting system 1bean : 1sugar beets : 2 cotton : 1winter wheat : seedling then 1cotton 11,4 thousand pieces per hectare in the system from the bean into 1bean : 2 cotton : 1sugar beets : 1cotton: After two years of pruning in the 1winter wheat crop system, it was observed that it decreased by 3,5 thousand piece per hectare (table 50).

In the conditions of typical gray soils of the Tashkent region, it will take 14-15 days to get a full planting of sugar beets planted within acceptable terms. The number of seedlings that die at the end of the validity period is relatively low when the planting thickness of sugar beets is left to 90 thousand/pieces per hectare and is maintained in a high irrigation procedure (75-75-70%).

In conditions of bald soils of Kashkadarya region, the planting thickness of sugar beets is 110 thousand/ha, the norm of mineral fertilizers is N_{150} R_{105} K_{75} kg/ha, irrigation procedure is 75-75-75%, which causes the death of seedling thickness in a small amount (1.8-2.0 thousand/ha).

When planting sugar beet in the conditions of meadow-alluvial soils of Khorezm region by exchanging it with agricultural crops, the cultivation of it after 2 alfalfa : 1 sugar beet : 1 bean: 2 cotton 2 after years of alfalfa in the cotton system and 1 bean: 2 cotton: 1 sugar beet : 1 cotton: 1 after years of cotton in the winter wheat system creates.

Table 50

Planting thickness of sugar beets in crop rotation systems (Meadow-alluvial soils, Khorezm region)

Opt.	Planting of crops by years						2000 y.		2001 y.		2002 y.		2004 y.		2005 y.	
	2000	2001	2002	2003	2004	2005	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period	At the beginning of the validity period	At the end of the validity period
1	Sugar beet	Sugar beet	Sugar beet	-//-	-//-	-//-	90,0	76,3	90,0	75,6	90,0	77,4	90,0	69,4	90,0	70,1
2	Winter wheat	-//-	-//-	-//-	-//-	-//-	-	-	-	-	-	-	-	-	-	-
3	Cotton	-//-	-//	-//	-//	-//	-	-	-	-	-	-	-	-	-	-
4	Winter wheat	Sugar beet	Soy bean	Winter wheat	Cotton	Cotton	-	-	90,0	79,3	-	-	-	-	-	-
5	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton	-	-	-	-	90,0	87,4	-	-	-	-
6	Soy bean	Sugar beet	Cotton	Cotton	Winter wheat	Cotton	-	-	90,0	78,6	-	-	-	-	-	-
7	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat	-	-	-	-	-	-	-	-	-	-
8	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton	-	-	90,0	80,6	-	-	-	-	-	-

The growth and development of sugar beet

The growth and development of sugar beets directly depends on the thickness of the plant seedlings, the norms of these fertilizers applied, the order of irrigation and other external factors.

According to the experience conducted in the conditions of typical gray soils of Tashkent region, the number and mass of leaves of the plant in the options with a seed thickness of 90 thousand soil per hectare, compared to the options with a soil mass of 110 thousand per hectare, 5-7 piece and from 60 to 40 g. it was observed that it was high. Also, the fact that this fertilizer has a high standard and irrigation procedure has also had a positive impact on growth and development. Irrigation procedure 75-75-70% and in this fertilizer norm NPK 150:105:75 32,1-29,3 piece, respectively, the number of leaves in the options with a mass of 264,8-258,1 g. if the irrigation procedure is 70-70-65% and in this fertilizer norm NPK is 100:75:50 kg/ha, then these indicators are respectively 25,7-18,7 piece and 215,5-194,0 g. it turned out to be quail (Table 51).

It is known that the main indicators in sugar beet are its association with rhizome. In particular, the data obtained on the root fruit diameters and length bean inverse correlation on the effect of the thickness of the seedlings. This is due to the fact that regardless of the fertilizer norm and irrigation procedures, in the options with a seedling thickness of 90 thousand/ha, the root fruit diameters bean a high figure, in the options with a seedling of 110 thousand/ha, a relatively low result, and in the data obtained from the length of the sugar beet, it can be observed.

The fact that this son was given a high standard also had a positive impact on the indicators of root fruit. In the options used in the norm this NPK 150:105:75 kg/ha, root fruit diameters, length and mass respectively average 10,9; 8,6; 12,2; 10,3 sm, 23,4; 23,3; 25,6; 26,8 sm, 516,7; 486,1; 615,5; 562,4 g. this fertilizer norm NPK 100: 75: 50 kg/ha used in the options, respectively 8,9; 7,0; 9,9; 7,8 sm, 21,4; 22,7; 22,4; 23,5 sm, 458,3; 426,1; 505,7; 476,3 g. it was determined.. As can be seen, these fertilizers have a high standard root fruit diameters and length up to 2.5-3,5 sm, while the mass is 50-60 g. boosted.

The high level of irrigation procedures also had a positive impact on these biometric indicators. In options with a high irrigation order, 75-75-70%, biometric indicators are 9,9; 7,8; 12,2; 10,3 sm, 22,4; 23,5; 25,6; 26,8 sm, 505,7; 476,3; 615,5; 562,4 g. in the case of options with an irrigation order of 70-70-65%, this figure is 8,9; 7,0; 10,9; 8,6 sm, 21,4; 22,7; 23,4; 23,3 sm, 458,3; 426,1; 516,7; 486,1 g. it was. In this also have a high watering order its diameters and length 0.2-0.3 t/ha, while the mass 45-100 g. ensured that it was high (52, 53, 54-tables).

According to the data obtained from the experiments conducted on the barren soils of the Kashkadarya branch of the former Uzbek Institute of Cotton Research, the thickness of the seedling is 90 thousand hectares, the root mass of sugar beet is 750-760 g in options with the norm of this fertilizer is N_{150} R_{105} K_{75} kg/ha, the irrigation procedure is 75-75-75 %, in the same fertilizer norm and in the order of irrigation, when the thickness of the seedlings is 110 thousand/ha, 645-650 g. it was observed that he founded.

Watering procedure 70-70-70%, this fertilizer norm NPK 150: 105: 75 kg/ha, root fruit in options with a seed thickness of 90 thousand/ha, and diameters 29,3 sm and length 10,5 sm. it was observed that these indicators were 35,3 sm; 13,4 sm. in the 75-75-75% of the irrigation order in the same planting thickness and in the norm of this fertilizer, if it was formed.

According to the results of the research conducted in the conditions of meadow-salt soils of the Fergana region, the highest indicators were observed in the options that left 90 thousand seedlings per hectare, supported the norm of this fertilizer to R_{150} R_{140} K_{80} kg/ha, conducted irrigation in the order of 60-70-65% of CHDNS, root fruit length 17,1 sm., diameters 8,2 sm. made up. Close results of this study and irrigation were also observed in options with planting thickness of 110 thousand/ha in the same norms and procedures (table 56).

Table 51

Sugar beet leaf mass and number (Typical gray soils, Tashkent region)

Options	Average weight and number of leaves of one plants																	
	1993 yr.						1994 yr.						1995 yr.					
	Mass of leaves, g.					Number of leaves, piece	Mass of leaves, g.					Number of leaves, piece	Mass of leaves, g.					Number of leaves piece
	5.YI	2.YII	1.YIII	2.IX	1.X		4.Y	12.YII	1.YIII	2.IX	1.X		6.YI	2.YII	1.YIII	2.IX	1.X	
1	58,3	175,3	274,7	236,4	194,0	23,6	62,9	155,1	278,6	254,3	172,3	17,7	74,2	165,1	286,6	268,7	215,5	25,7
2	43,4	164,1	242,3	214,3	162,2	16,7	54,3	144,1	260,4	221,8	154,1	14,3	62,3	145,3	269,4	238,5	194,0	18,1
3	67,8	187,8	320,7	278,1	231,2	27,2	74,2	178,3	306,4	287,0	214,5	22,4	86,7	194,4	347,4	325,6	262,1	30,6
4	62,4	176,5	284,2	242,2	208,0	20,8	70,3	166,7	284,0	257,5	191,7	19,7	75,7	182,3	313,5	281,9	239,1	22,6
5	68,7	184,5	310,0	251,6	216,9	25,0	73,4	174,7	293,9	267,6	203,5	21,8	77,3	175,6	346,3	304,4	243,7	27,3
6	65,3	170,1	290,4	236,7	194,5	20,4	64,5	163,3	264,9	235,6	186,4	17,0	68,3	168,4	321,1	263,0	222,1	21,5
7	71,7	200,1	361,2	304,2	245,1	28,7	78,7	193,4	378,6	350,6	226,1	23,7	92,4	217,3	389,4	320,4	264,8	32,1
8	68,3	193,4	330,7	275,5	225,9	25,3	75,0	187,3	346,6	324,7	200,3	21,5	88,1	202,1	361,3	291,1	258,1	29,3

Table 52

Sugar beet root fruit diameter
(Typical gray soils, Tashkent region)

Options	CHDNS of relative irrigation regime, %	Planting system	Root diameter, sm.											
			1993 yr.				1994 yr.				1995 yr.			
			2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X
NPK 100:75:50 kg/ha														
1	70-70-65	60x18-1	3,1	6,0	7,7	8,5	2,7	6,4	7,3	8,0	3,5	6,5	7,6	8,9
2	-//-	60x15-1	2,8	3,7	5,4	6,8	2,1	4,3	5,7	6,7	3,0	4,8	5,5	7,0
NPK 105:105:75 kg/ha														
3	-//-	60x18-1	4,2	6,8	9,1	9,3	3,6	7,5	8,3	8,9	4,1	7,5	8,6	10,9
4	-//-	60x15-1	3,6	4,8	6,8	8,0	3,0	5,8	6,6	7,6	3,7	5,9	7,2	8,6
NPK 100:75:50 kg/ha														
5	75-75-70	60x18-1	3,8	6,6	8,7	9,5	3,2	7,0	8,1	8,8	3,8	7,1	8,4	9,9
6	-//-	60x15-1	3,0	4,6	6,9	7,8	2,9	5,3	6,5	7,2	3,2	5,6	6,8	7,8
NPK 150:105:75 kg/ha														
7	-//-	60x18-1	4,9	8,3	10,4	11,8	4,2	8,4	9,1	9,8	4,4	8,3	10,5	12,2
8	-//-	60x15-1	4,3	7,0	8,8	9,5	3,7	6,9	7,6	8,7	4,0	6,8	8,7	10,3

53-table

Sugar beet root fruit length
(Typical gray soils, Tashkent region)

№ opt.	Planting system	CHDNS of relative irrigation regime, %	Root length, sm.											
			1993 yr.				1994 yr.				1995 yr.			
			2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X
NPK 100:75:50 kg/ha														
1	60x18-1	70-70-65	7,3	16,4	19,4	20,4	6,4	15,0	17,2	19,5	7,7	16,6	18,3	21,4
2	60x15-1	-//-	8,5	16,8	20,7	21,4	7,0	15,9	18,3	20,6	8,5	17,3	19,4	22,7
NPK 150:105:75 kg/ha														
3	60x18-1	-//-	8,4	17,4	21,2	22,1	7,6	16,7	19,5	21,1	8,6	18,1	21,3	23,4
4	60x15-1	-//-	8,1	18,1	22,1	22,6	8,1	17,3	19,6	22,0	9,2	18,5	22,3	23,3
NPK 100:75:50 kg/ha														
5	60x18-1	75-75-70	7,5	16,2	20,8	21,4	7,3	16,0	18,7	22,5	8,0	18,0	20,1	22,4
6	60x15-1	-//-	8,3	17,7	21,3	22,0	7,9	16,3	20,1	21,5	8,8	18,4	21,4	23,5
NPK 150:105:75 kg/ha														
7	60x18-1	-//-	9,1	20,0	23,5	24,5	8,7	19,2	21,1	23,2	9,9	21,6	23,5	25,6
8	60x15-1	-//-	9,8	21,8	24,5	25,2	9,4	20,9	22,4	24,3	10,6	22,0	24,4	26,8

Table 54

Sugar beet root fruit mass, g.
(Typical gray soils, Tashkent region)

№ opt.	Planting scheme	CHDNS of relative irrigation regime, %	A single root mass, g.											
			1994 y .				1994 y .				1995 y .			
			2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X	2.YII	1.YIII	2.IX	1.X
NPK 100:75:50 kg/ha														
1	60x18-1	70-70-65	52,3	234,9	405,1	450,0	47,7	253,1	350,6	411,4	61,1	260,1	362,5	458,3
2	60x15-1	-//-	40,1	191,0	350,7	408,3	36,5	235,0	285,0	322,0	52,4	228,7	245,5	426,1
NPK 150:105:75 kg/ha														
3	60x18-1	-//-	76,3	305,0	447,0	495,1	63,5	285,0	402,3	432,2	74,5	297,2	452,4	516,7
4	60x15-1	-//-	55,1	245,8	323,4	435,1	51,1	264,4	345,0	385,6	59,3	235,0	397,3	486,1
NPK 100:75:50 kg/ha														
5	60x18-1	75-75-70	67,8	287,9	443,0	490,0	58,7	272,0	378,3	439,1	66,3	280,2	432,9	505,7
6	60x15-1	-//-	60,2	220,4	376,4	440,6	50,3	247,3	335,6	385,3	51,6	222,5	387,2	476,3
NPK 150:105:75 kg/ha														
7	60x18-1	-//-	87,5	385,0	533,0	586,9	69,7	360,0	483,0	550,0	98,7	418,0	525,0	615,5
8	60x15-1	-//-	74,3	312,5	455,0	510,0	63,4	335,0	391,3	473,1	86,8	341,7	453,5	562,4

Table 55

Sugar beet root mass, length, diameter
(Loamy soils, Kashkadarya region)

Options	Root mass, g.				Root length, sm.				Root diameter,sm.			
	2.YI	1.YIII	3.IX	1.X	2.YII	1.YIII	3.IX	1.X	2.YII	1.YIII	3.IX	1.X
1	67,5	250,0	534,1	587,5	10,7	19,6	24,3	27,6	3,9	7,5	9,4	10,7
2	58,7	231,7	500,0	498,7	9,0	17,5	21,0	23,8	3,6	7,1	8,8	9,6
3	80,4	300,0	580,0	649,4	10,1	21,0	27,8	29,3	4,3	8,4	9,7	10,5
4	73,4	284,1	565,3	551,8	9,5	20,8	26,0	27,8	4,1	8,0	9,5	10,0
5	88,1	315,1	590,7	682,1	10,6	21,7	28,6	30,0	4,4	8,7	10,0	11,1
6	71,6	285,1	546,1	582,1	9,8	19,3	26,4	29,1	4,0	8,3	9,2	10,4
7	114,3	392,1	671,8	762,3	12,8	26,8	33,7	35,3	6,2	10,5	12,1	13,4
8	98,6	363,1	619,2	648,5	11,4	25,7	30,5	32,7	5,7	9,7	11,3	12,1

According to the results of the research conducted on the soil of the gray meadow of the Jizzakh region, the highest indicators are observed in the option that the planting thickness is 90,6 thousand/ha irrigation procedure is 75-75-60% compared to the CHDNS, the length is 22,2 sm.,leaf is 10,2 sm. root fruit diameter 8,2 sm. and weight 1440 g. made up (57-table).

Similar data were also observed in the experiment conducted in the conditions of meadow-gray soils of the Samarkand region (table 58).

Hence, in conditions of barren soils, the high biometric indicators of sugar beet root formation are associated with the norm of mineral fertilizers and irrigation procedures, and high results can be achieved when the norm of fertilizers is N_{150} R_{105} K_{75} kg/ha, and the irrigation procedure is 75-75-75% compared to CHDNS. As such, in the conditions of soils of Fergana, Jizzakh and Samarkand regions, each will have a positive effect on the growth and development of the plant when the thickness of the seedling is maintained (up to N_{150} R_{140} K_{80} kg/ha), leaving 90 thousand /ha and supporting the ore in high standard. According to the procedures for watering sugar beets, the same opinion can not be stated for the regions with the above names.

Irrigation of sugar beet in the upper irrigation order in Tashkent, Kashkadarya, Jizzakh and Samarkand regions will ensure the growth and development of the plant in the normative manner, and in the meadow-salt soils of Fergana region it will be enough to provide care for sugar beet in the lower irrigation procedures.

According to the data from the research on the exchange of sugar beet planted in the meadow-alluvial soils of the Khorezm branch of the former Research Institute of cotton growing of Uzbekistan, the cultivation of sugar beet into a chronic field adversely affected its growth and development.

In the first year of the experiment, the number and mass of leaves in the plant were 38,5 pieces and 273,5 g. in the first year of the planting option of beet absolute sugar. In the third year of the experiment, these indicators were 24,9 piece and 198,7 g, in the sixth year-19,7 piece and 154,3 g. it was observed. Also, in the data obtained on the diameter, length and mass of root fruit, the same legislation is observed, in the

Table 56

The mode of irrigation, the effect of mineral fertilizers on the growth and development of sugar beet (Fergana region, meadow-salt soils)

CHDNS of relative irrigation regime, %	Norm of fertilizers, kg/ha.	Seedling thickness, thousand/ha	Actual seedling thickness thousand/ha.	Root length, sm.	Root diameter, sm.
60-70-65	N 100 R 70 K 40	90	90,3	15,2	7,7
		110	111,8	15,0	7,6
	N 150 R 140 K 80	90	91,6	17,1	8,2
		110	111,6	16,8	8,1
60-75-65	N 100 R 70 K 40	90	89,9	14,4	7,3
		110	111,5	14,1	7,0
	N 150 R 140 K 80	90	91,2	15,2	7,7
		110	110,3	14,6	7,2

Table 57

The effect of irrigation procedure and planting thickness on the growth and development of sugar beets

(Jizzakh region, meadow-gray soils)

Opt.	CHDNS of relative irrigation regime, %	At the end of the validity period				
		Actual seedling thickness thousand/h	Leaf length sm.	Leaf width sm	Root diameter, sm.	Root mass, g
1	65-65-60	94,1	21,2	9,7	6,7	1096
2		111,4	20,0	9,0	6,0	989
3		130,3	18,0	8,3	5,3	640
4	70-70-60	92,3	19,2	8,2	7,2	1325
5		109,2	20,4	7,8	6,8	820
6		131,0	19,8	6,9	6,0	655
7	75-75-60	90,6	22,2	10,2	8,2	1440
8		112,4	18,4	8,9	8,0	970

first year of the respectively 13,1 sm, 24,7 sm. and 1238,4 g, in the third year of the experiment 11,6 sm, 23,6 sm. and 910,3 g. and in the sixth year 7,4 sm, 18,7 sm. and 714,6 g. made up.

Apparently, by the sixth year of the experiment, biometric indicators decreased by 40-50% compared to the bench press. In contrast, positive data were observed in sow options by sharing experience.

According to the systems established in the second year of the experiment, sugar beets were sown after winter wheat and bean. According to the data obtained, when sugar beets are sown after the fall, the number and mass of its leaves are 31,5-32,1 pieces and 239,5-244,4 g. root fruit diameter, length and mass respectively 13,0-13,9 sm, 25,8-27,0 sm, 4361,6-1300,8 g. made up. When planted after the bean, respectively, the leaves 35,6 sm.; 258,1 g; 14,0 sm; 27,1 sm and 1450,6 g. it was determined. Similar indicators indicate the third year of the experiment (2002 y.) observed when sugar beet is sown after two years of growing, the number and mass of the leaves are 37,7 pieces, 261,4 g. root fruit mass is 1423,6 g. made up. The cultivation of sugar beets after two years of sorrel also did not give a positive result (table 59).

Based on the above information, it can be concluded that for the normative growing development of sugar beet, it is desirable to determine the thickness of the seedlings in its care to 90 thousand/ha, the norm of mineral fertilizers to NPK 150:105:75 kg/ha, the order of irrigation to 75-75-70% compared to CHDNS.

Table 58

The effect of irrigation procedure and planting thickness on the growth and development of sugar beets (Meadow-gray soils of Samarkand region)

№ Opt.	1-june		1-july				1-august			
	Leaf length sm.	Root length, sm.	Leaf length sm.	Root length, sm.	Leaf mass, g	Root mass, g.	Leaf length sm.	Root length, sm.	Leaf mass, g	Root mass, g.
1	24,3	15,7	27,5	24,6	361,3	291,7	32,8	30,2	521,2	684,8
2	24,7	15,7	28,2	25,1	376,2	297,0	33,0	30,8	523,6	796,3
3	25,4	15,7	28,5	25,1	372,2	311,5	30,6	30,8	538,5	794,7
4	24,1	15,6	28,5	25,3	372,9	314,7	30,7	30,6	541,0	795,6
5	24,8	16,2	28,5	25,5	374,9	313,7	29,9	30,3	544,1	782,2
6	24,6	14,9	28,2	24,7	365,1	288,9	29,5	29,4	507,6	681,7
7	25,2	14,9	28,7	25,3	376,8	324,3	30,6	30,2	535,2	883,2
8	24,8	14,6	27,9	24,9	371,5	326,5	31,0	29,9	558,5	892,0
9	25,3	15,4	28,1	25,2	372,3	328,9	29,8	29,3	557,8	899,8
10	26,1	15,8	28,3	25,8	374,2	328,2	29,9	29,3	566,5	891,2

Table 59

Biometric indicators of sugar beet in crop rotation systems
(Meadow-alluvial soils, Khorezm region)

№ Opt.	Location of crops by years						Number of leaf, piece	Leaf mass, g	Root mass, g.	Root diameter, sm.	Root length, sm.
	2000	2001	2002	2003	2004	2005					
2000 yr.											
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	38,5	273,5	1238,4	13,1	24,7
2001 yr.											
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	30,6	224,8	1110,3	11,3	23,3
4	Winter wheat	Sugar beet	Soy bean	Winter wheat	Cotton	Cotton	31,5	239,5	1361,6	13,0	25,8
6	Soy bean	Sugar beet	Cotton	Cotton	Winter wheat	Cotton	35,6	258,1	1450,6	14,0	27,1
8	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton	32,1	244,4	1300,8	13,9	27,0
2002 yr.											
1	Sugar beet	-//-	-//-	-//-	-//	-//-	24,9	198,7	910,3	11,6	23,6
5	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton	37,7	261,4	1423,6	14,6	27,5
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	22,4	178,6	837,0	9,0	24,0
7	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat	29,5	224,5	1236,0	13,0	29,5
2004 yr.											
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	22,8	184,0	785,0	8,5	22,2
2005 yr.											
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	19,7	151,3	714,6	7,4	18,7

The root fruit yield, sugar content and sugar yield

The effect of this root fruit on productivity was observed when it was studied different planting thickness, norms of mineral fertilizers and irrigation procedures by sequencing it with agricultural crops in the cultivation of sugar beets.

According to the data from the experiment conducted on typical gray soils of the Tashkent region, the yield of root fruit was high when the thickness of the seedlings was 110 thousand hectares, regardless of the standard of mineral fertilizers and the order of irrigation. Norm of mineral fertilizers NPK 150:105:75 kg/ha, irrigation procedure 75-75-70%, planting thickness 110 thousand/ha, the root fruit yield average in three years to 51,24 t/ha, the same fertilizer norm and irrigation procedure to 90 thousand/ha in the thickness of seedlings this indicator was 48,53 t/ha. In general, the additional yield obtained by the thickness of the seedlings was 1,29-2,66 t/ha among the options.

Table 60

Sugar beet of mine and local fertilizers impact on root fruit productivity (Tashkent region, meadow alluvial soils)

Opt.	Annual amount of fertilizers, kg/h				Root yield, t/ha	Addiotional yield, t/ha	
	N	P_2O_5	K_2O	Manure, t/ha		Relative to control	On the background
1	-	-	-	-	17,50	-	-
2	120	120	80	-	22,40	4,90	-
3	-	-	-	10	24,40	6,94	2,04
4	120	120	80	10	28,50	11,0	6,10
5	-	-	-	20	26,25	8,75	3,85
6	120	120	80	20	30,57	13,07	8,17

In the care of sugar beet, the supply of mineral fertilizers to a high standard (NPK 150:105:75 kg/ha) allowed to obtain an additional root fruit crop of 4,98-7,78 t/ha between options. The thickness of the seedling was 110 thousand/ha, while the irrigation procedure was 70-70-65%, when the mine fertilizers NPK norm was applied to 100:75:50 kg/ha, the root fruit yield was 39,35 t/ha, while the NPK was applied to 150:105:75 kg/ha to 44,9 t/ha.

It should be noted that since sugar beet is a moisture-loving plant, the effect of irrigation procedures was also noticeable. When sugar beet was watered 75-75-70% in high irrigation, the additional yield from root fruit was an average of 3,72-6,26 t/ha compared to the second irrigation procedure (70-70-65%). The norm of mineral fertilizers was NRK 150: 105: 75 kg/ha, the thickness of the seedling was 90 thousand/ha, when the sugar beet was watered in the order of 70-70-65% irrigation, the yield was 43,0 t/ha, while the same fertilizer was watered in the order of 75-75-70% of the norm and the thickness.(table 61)

According to the results of the experiment conducted in the conditions of barren soils of the Kashkadarya branch of the former Uzbek Institute of scientific research on cotton growing, in all options with a seed thickness of 110 thousand/ha, the yield from root fruit to 1,23-3,03 t/ha was higher than the norm of mineral fertilizers and irrigation procedures. Also, the high standard of mineral fertilizers also had a positive effect on productivity. If the norm of mineral fertilizers was N_{100} R_{75} K_{50} kg/ha, the irrigation procedure was 75-75-75%, the yield in the option with a seed thickness of 110 thousand/ha was 58,6 t/ha, then in the same planting thickness and irrigation procedure, the yield in the section of mineral fertilizers to N_{150} R_{105} K_{75} kg/ha was 66,3 t/ha. The high order of irrigation also had a positive impact on productivity. The irrigation procedure was 70-70-70%, N_{150} R_{105} K_{75} kg/ha, the yield was 11,0-55,6 t/ha in option with a planting thickness of 75-75-75% compared to CHDNS in the same fertilizer standard and planting thickness ensured that the yield was 66,3 t/ha (table 62).

Also, in the study conducted in the conditions of meadow-burrow soils of the Bukhara region, the highest yield of root fruit was observed in the option with a planting thickness of 90 thousand per hectare, the standard of mineral fertilizers N_{150} R_{140} K_{80} kg/ha, the irrigation procedure is 60-80-65% compared to CHDNS, to 52,8 t/ha made up. In general, under these conditions, the fact that there were 90 thousand/ha of planting thickness ensured that the yield of root fruit was high.

It is worth noting that in the options with a watering order of 60-70-65% compared to CHDNS, the effect of mineral root fruit on the yield was observed to the same as that of the indicators are 467,3;434,2 t/ha (N100 R75 K40 kg/ha) and 459,4; 428,6 t/ha (N_{150} R_{140} K_{80} kg/ha) organized (table 63).

In the experiment conducted in the conditions of meadow-salt soils of the Fergana region, the highest yield was observed in the options where the seedling thickness was 110 thousand/ha, the lower order of irrigation was 60-70-65% compared to CHDNS, and the use of mineral fertilizers N_{150} R_{140} K_{80} kg/m². The highest level of sugar content was observed in the option where the seedling thickness was 110 thousand bush, the irrigation procedure was high, the yield was 60-75-65% compared to CHDNS, the yield was in the norm of N_{100} R_{70} K_{40} kg/ha and it was 21,2% (table 64).

Table 61

Root yield of sugar beet
(Typical gray soils, Tashkent region)

Options	CHDNS of relative irrigation regime, %	Norm of mineral fertilizers kg/ha	Seedling thickness, thousand/ha	Root yield, t/ha			Average productivity, t/ha	Additional yield, t/ha		
				1993 year	1994 year	1995 year		From seedling thickness	From mineral fertilizers	From the order of irrigation
1	70-70-65	NPK 100:75:50	90	38,49	35,76	39,95	38,06	-	-	-
2			110	39,61	37,0	41,44	39,35	+1,29	-	-
3		NPK 150:105:75	90	43,40	39,99	35,75	43,04	-	4,98	-
4			110	45,55	41,66	47,73	44,98	+1,94	+5,63	-
5	75-75-70	NPK 100:75:50	90	42,31	38,03	45,02	41,78	-	-	+3,72
6			110	43,73	39,52	47,13	43,46	+1,68	-	+4,11
7		NPK 150:105:75	90	49,16	44,44	52,14	48,58	-	+6,8	+5,54
8			110	51,46	47,76	54,51	51,24	+2,66	+7,78	+6,26

NSR_{05}=± t/ha 1,21 t/ha ; 1,10 t/ha ; 1,03 t/ha

Table 62

Leaf and root yield of sugar beet
(Loamy soils, Kashkadarya region)

Options	Root yield, t/ha				Average productivity, t/ha			Leaf yield, t/ha	Sugar content, %	Sugar yield, kg/ha (In an average of three years)
	1993 yr.	1994 yr.	1995 yr.	In an average of three years	From seedling thickness	Norm of mineral fertilizers	From the order of irrigation			
1	49,45	49,78	44,77	48,00	-	-	-	19,36	20,9	100,2
2	50,74	50,88	46,08	49,23	+1,23	-	-	22,84	21,2	104,3
3	55,22	55,44	50,66	53,77	-	5,77	-	21,85	20,5	110,2
4	57,31	57,22	52,46	55,66	+1,69	6,43	-	25,36	20,7	115,2
5	57,6	58,33	53,47	56,35	-	-	8,35	22,28	20,3	114,3
6	59,27	60,63	55,90	58,60	+2,,5	-	9,37	26,12	20,6	120,7
7	64,13	65,42	60,36	63,30	-	6,95	9,53	24,87	20,2	127,8
8	67,03	68,53	63,43	66,33	+3,03	7,73	10,67	28,82	20,4	135,3

NSR_{05}=0,542; 1,091; 1,077 t/ha Sx 1,78%; 3,59%; 3,54%

Table 63

Irrigation procedure, the norm of mineral fertilizers and the thickness of seedlingseffect of sugar beet on root yield

(Meadow-gray soils of Bukhara region)

CHDNS of relative irrigation regime, %	Norm of fertilizers, kg/ha	Seedling thickness, thousand/ha	Actual Seedling thickness, thousand/ha	The thickness seedlings at the end of the application period	Root yield, t/ha
60-70-65	$N_{100} P_{75} K_{40}$	90	92,6	81,5	46,73
		110	111,3	94,6	43,42
	$N_{150} P_{140} K_{80}$	90	91,9	96,3	45,94
		110	108,5	95,7	42,86
60-80-65	$N_{100} P_{75} K_{40}$	90	93,5	85,2	50,10
		110	111,3	92,6	43,72
	$N_{150} P_{140} K_{80}$	90	94,7	88,7	52,88
		110	108,4	93,8	45,65

Similar studies were conducted in the conditions of meadow-gray soils of Jizzakh and Samarkand regions, the highest root fruit yield was determined in the Jizzakh region in the options with a seedling thickness of 90 thousand/ha, irrigation procedure 75-75-60% compared to CHDNS, to 92,0 c/ha., while the highest sugar content was determined in the option where the irrigation order of 90 thousand per hectare of planting thickness was 65-65-60% compared to CHDNS-22,3% (table 65).

Table 64

Irrigation procedure, the norm of mineral fertilizers and the thickness of seedlings effect of sugar beet on root yield (Fergana region, meadow-salt soils)

Opt.	CHDNS of relative irrigation regime, %	Norm of fertilizers, kg/ha	Seedling thickness, thousand/h	Actual Seedling thickness, thousand/h	Amount of sugar, %	Productivity, t/ha	Additional yield, t/ha		
							From the order of irrigation	From mineral fertilizers	From seedling thickness
1	60-70-65	N 100 P 70 K 40	90	90,3	20,3	53,47			2,43
2			110	111,8	20,5	55,90		7,21	
3		N 150 P 140 K 80	90	91,6	20,2	60,36			2,85
4			110	111,6	20,4	63,43	9,79		
5	60-75-65	N 100 P 70 K 40	90	89,9	20,9	44,77			9,32
6			110	111,5	21,2	46,09		6,14	
7		N 150 P 140 K 80	90	91,2	20,5	50,66			1,81
8			110	110,3	20,7	52,47			

Table 65

The effect of irrigation procedure and planting thickness on the yield and sugar content of beet root

(Jizzakh region, meadow-gray soils)

Options	CHDNS of relative irrigation regime, %	Actual Seedling thickness, thousand/h	Productivity t/ha	Sugar level, %
1	65-65-60	94,1	63,5	22,3
2		111,4	53,0	21,6
3		130,3	51,0	19,0
4	70-70-60	92,3	78,0	21,2
5		109,2	69,5	20,1
6		131,0	60,0	18,8
7	75-75-60	90,6	92,0	19,7
8		112,4	86,0	19,1

In the experiment conducted in the soil conditions of Samarkand region, a relatively high crop of root field left 90 thousand bush per hectare of planting thickness, supporting the norm of the ore oghuz to N_{150} R_{100} K_{75} kg/ha in its care, irrigation works were 75-75-60% compared to CHDNS, ensuring that the yield was 60,19 t/ha (table 66).

Similar data were obtained from the experiment in the conditions of meadow-alluvial soils of Khorezm region, the root fruit crop in the amount of 58,86 t/ha was irrigated at 90 thousand hectares of sugar beet planting thickness, the norm of mineral fertilizers was N_{200} R_{140} K_{80} kg/ha, the irrigation procedure was carried out at 75-75-60% compared. (table 67).

Table 66

The effect of irrigation procedure and planting thickness on the yield and sugar content of beet root

(Meadow-gray soils of Samarkand region)

Opt.	Norm of fertilizers, kg/h			CHDNS of relative irrigation regime, %	Seedling thickness, thousand/h		Root yield t/ha
	N	P_2O_5	K_2O		At the beginning of the validity period	At the end of the validity period	
1	-	-	-	70-70-60	90	86,5	53,5
2	100	70	50	70-70-60	90	86,8	56,4
3	100	70	50	70-70-60	110	105,8	57,5
4	150	100	75	70-70-60	90	85,8	57,8
5	150	100	75	70-70-60	110	106,9	59,7
6	-	-	-	75-75-60	90	86,4	54,9
7	100	70	50	75-75-60	90	86,0	58,2
8	100	70	50	75-75-60	110	106,1	59,5
9	150	100	75	75-75-60	90	86,3	60,2
10	150	100	75	75-75-60	110	107,2	59,9

Proceeding from the above information, we can conclude that in order to obtain a high yield from sugar beet, different agrotechnics are required in different soil climatic conditions of the Republic.

Table 67

The effect of irrigation procedure, the norm of mineral fertilizers and the thickness of seedlings on the yield of sugar beet root

(Khorezm region, meadow-alluvial soils)

Opt.	Experience options		Seedling thickness, thousand/ha	Root yield on repetetions, t/ha			Average
	CHDNS of relative irrigation regime, %	Norm of fertilizers, kg/ha		I	II	III	
1	70-70-60	NPK 100-70-40	89,3	37,0	47,5	53,3	45,93
2		NPK 200-140-80	87,1	39,5	63,0	64,6	55,70
3	75-75-60	NPK 100-70-40	90,6	38,9	61,0	59,6	53,16
4		NPK 200-140-80	88,3	41,7	68,9	66,0	58,86

In its cultivation, even in all soils, the same planting thickness, the norm of mineral fertilizers and irrigation procedures will not be supported. When obtaining a rich and high-quality harvest from sugar beets, the use of agrotechnical measures in accordance with the results obtained from research, corresponding to soil types, becomes important in practice.

One of the main features of sugar beet is its level of sugar content. According to the data from the study conducted in the conditions of typical gray soils of the Tashkent region, with the entire period of validity of sugar accumulation in the sugar beet, this process begins mainly in early August. If the level of sugar content in August was 13,3-15,0% on average, in September 14,0-15,5%, and in October the highest indicators were observed, then the level of sugar content was determined to be 16-20% and more.

It should be noted that the thick (up to 110 thousand/ha) placement of the plant in the field increased its sugar content. It was observed that in the options with 110 thousand/ha seedlings of the experiment, the sugar content was 90-0,5% higher than in the options with 0,3 thousand/ha.

The high standard of mineral fertilizers adversely affected the level of sugar content. If the sugar content of the mineral fertilizer was 150-105% in the options given the norm to 75:18,3:18,8 kg/ha, then in the options fertilized by the norm to 100:75:50 kg/ha, this indicator was observed to be 19,1-19,6%, that is, to 0,8% higher.

The high level of irrigation procedures also adversely affected the level of sugar content. The level of sugar content in options with an irrigation procedure 70-70-65%, respectively 20,6-20,9-19,7-20,0 if the irrigation order is 75-75-70%, then in options with a watering order of 1,0-1,5%, this indicator is less, that is, accordingly to 19,1-19,6-18,3-18,8% it was equal. (Table 68)

It is worth noting that, although in the low-sugar options, where the sugar content of root fruit was high, the above-mentioned options, on account of the high yield of root fruit, the sugar yield was abundant. According to the data obtained from sugar beet root fruit on sugar yield, the highest sugar yield was observed in the option of the experiment with a seedling thickness of 110 thousand/ha, the norm of mineral fertilizers is NRK 150:105:75 kg/ha, and the irrigation procedure is 75-75-70% - 9,32 t/ha.

According to the data from the experiment conducted on the meadow-alluvial soils of the Khorezm region, the highest level of sugar beet in root fruit was found in 1bean : 1sugar beet : 2 cotton: 1winter wheat: 1bean : 2 in the options planted after the winter wheat in the cotton system 20,0-19,0%. The highest sugar yield was observed in the options of 1bean : 1sugar beet : 2cotton: 1winter wheat : 1cotton system after bean: (8,7,0 t/ha) and 2alfalfa: 1sugar beet: 1bean:2cotton system after alfalfa (8,27 t/ha).As a result of the cultivation of sugar beets into a chronic field, the sugar content decreased by 4,2% compared to the initial figure. The minimum indicator for crop rotation systems 1bean : 2cotton: 1sugar beet : 1cotton: 1winter wheat: 18.5% was determined in the option planted after the cotton in the crop rotation system (Table 69).

Table 68

Dynamics of sugar accumulation in sugar beet
(Typical gray soils, Tashkent region)

Options	CHDNS of relative irrigation regime, %	Norm of mineral fertilizers, kg/ha	Seedling thickness, thousand/ha	1993 yr.			1994 yr.			1995 yr.		
				1.YIII	2.IX	1.X	1.YIII	2.IX	1.X	1.YIII	2.IX	1.X
1	70-70-65	NPK 100:75:50	90	14,0	15,3	17,6	14,6	16,8	21,6	15,3	16,5	20,6
2			110	14,4	16,0	17,8	15,0	17,3	21,6	15,3	17,4	20,9
3		NPK 150:105:75	90	13,4	14,7	16,4	14,0	16,5	21,0	13,8	15,7	19,7
4			110	13,7	14,9	17,1	14,3	16,9	21,3	14,4	15,1	20,0
5	75-75-70	NPK 100:75:50	90	13,3	14,0	15,8	13,4	15,8	20,6	13,3	15,3	19,1
6			110	14,2	14,5	16,2	13,8	16,1	20,9	14,1	16,0	19,6
7		NPK 150:105:75	90	13,0	13,7	15,4	13,0	15,1	19,6	12,8	14,9	18,3
8			110	13,4	13,8	15,9	13,1	15,6	20,0	13,0	15,0	18,8

Table 69

Sugar beet sugar level and sugar yield when planting alternately (Meadow-alluvial soils, Khorezm region)

№ Opt.	Type of crops by years						Root yield, t/ha	Root sugar yield, t/ha
	2000	2001	2002	2003	2004	2005		
2000 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	25,7	0,07
2001 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	27,0	0,06
4	Winter wheat	Sugar beet	Soy bean	Winter wheat	Cotton	Cotton	48,9	0,08
6	Soy bean	Sugar beet	Cotton	Cotton	Winter wheat	Cotton	53,0	0,09
8	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton	49,0	0,08
2002 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	27,6	0,06
5	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton	58,4	0,08
2003 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	26,7	0,05
7	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat	38,5	0,07
2004 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	27,1	0,05
2005 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	26,5	0,03

A brief history of sugar beet crop rotation

In conclusion from the numerous studies conducted and practical results in production, we can say that the role of sugar beet switching in planting is important.

High and high-quality root fruit crop from sugar beets was obtained when planted after the planting, when the harvest was well pasted for her. When determining the role in the alternation of sugar beet planting, it is important not only to choose a good pastoral for sugar beet, but also to develop other agricultural crops after sugar beet, that is, to determine the effect of sugar beet on other crops, as well as on the nutrient and water regime of the soil.

It is known that, on the scientific basis, the role of crop rotation in determining its location in planting and placing them correctly, in the fight against weeds, diseases and pests in the future, in the productive use of nutrients and water in the soil, in increasing the efficiency of mines and local fertilizers, plays an important role in obtaining high and high quality.

As pointed out M.A.Belousov (1947), it is required to pay attention to several important cases when determining the location of sugar beet in the alternation planting. Indeed, sugar beet will also be very demanding on nutrient elements in the soil, such as cotton, in particular the nitrogen element in the soil. Also, sugar beet is more demanding on the agrophysical properties of the soil, and the better the bulk mass and water permeability of the soil, the higher the biological potential yield. It is not recommended to take care of sugar beet in areas where the sizob water is close to 1,0-1,5 meters, since in such cases sugar beet can be infected with root disease.

Another of the main rules of sugar beet cultivation is to take into account climatic conditions and various external factors. One of such factors is the degree of supply of soil with moisture.

The systems of exchanging agricultural crops in wet inadequate areas are also different. In sufficiently supplied climates with moisture, the best for sugar beet is the autumn wheat, peas, corn and fairy-tale potatoes. In such areas, the sugar beet salinity in the alternation planting system can be set up to 30%. In these regions, winter wheat, intermediate crops can also be used. They can be well pasted with sugar beets, along with the accumulation of reserve moisture in the soil during the autumn.

Adding a clean plow to the planting system, where moisture in the soil is constantly exchanged in insufficient areas, creates good conditions for sugar beet. In such regions, the cultivation of peas, corn (for silage) and after many years of grasses in winter wheat and after it, sugar beet adversely affects the soil moisture system, and these crops (winter wheat and sugar beet) do not grow well as a result of insufficient moisture in the soil. Therefore, when planting sugar beets in these regions on an exchange with other crops, of course, it is necessary to place sugar beets after a clean plow.

In areas where there is not enough moisture, it is possible to collect moisture in the soil only during black plowing. Therefore, it is necessary to place sugar beets in these regions after the fall. Sugar beet is not recommended to be placed after summer repeated crops, sunflower, perennial grasses, as well as sugar beet, and increasing the sugar beet salinity by 20% in the alternation planting system does not give a good effect.

In general, in areas where there is not enough moisture, planting sugar beets after grain crops or after black plowing and clean plowing ensures a high and high-quality harvest of sugar beets.

It is also not recommended to plant sugar beet after winter intermediate crops in the years when the air has come dry. Under such conditions, it is desirable to plant such crops as potatoes, sunflower.

According to S.K.Kondrashev (1943), in 1940-1947 the exchange of beet was cotton-alfalfa-sugar beet the system of exchange in Uzbekistan, of 3alfalfa : 1sugar beet :1cotton: 1sugar beet:1cotton (3:1:1:1:1) or 3alfalfa: 1sugar beet : 2cotton: 1sugar beet: 2cotton (3:1:2:1:2) such as 7, 9-field crop rotation system. In this sugar beet was placed mainly after 3 years of quail and cotton, respectively, sugar beet was 33,3% -22,2%, alfalfa was 33,3%, cotton was 33,3% -44,4%.

Also, sugar beets are used in another alternate planting system, it is 9 field, 3alfalfa: 2sugar beet: 1winter wheat;1sugar beet :1winter wheat:1sugar beet: (3:2:1:1:1:1) received the appearance.

In the Kazakhstan and Kyrgyzstan Republics, a 7-and 8-fields system was used in the cultivation of sugar beets. They are: 8 fields, 1grain-legumes crops+vapor: 1winter wheat: 1sugar beets : 3alfalfa+ (with spring of 1 year): sugar beet : 1spring wheat (1:1:1:3:1:1) or 7 fields 1vapor: 1winter wheat: 1sugar beet: 3alfala (with 1-year spring wheat) : 1sugar beet (1:1:1:3:1) have established systems.

In general, based on the results of numerous studies conducted, as well as the expressed views on the determination of the location of sugar beet in the alternation planting, it is possible to conclude that the best pasted alfalfa, spike-grain crops in the irrigated areas for sugar beet are black and clean plows.

Due to the climatic conditions of the soil of our republic now, when placing sugar beets in the system of sequential planting of existing crops, it is desirable to place it after legumes-cereals, legumes and cereals.

It should be noted that as a result of the cultivation of sugar beets in a row in the field and the placement of it after a well-pasted crop, the moisture reserve in the soil is lost, the toxic properties of the soil increase, the types of diseases and pests increase, which causes a sharp decrease in the productivity of root fruit.

Research on the role of sugar beet in the exchange of plantations in different soil-climatic conditions of Uzbekistan has practically not been conducted, and this fact is very rare.

Due to this, extensive research work was carried out in 1993-1995 and 2000-2005 on determining the location of sugar beet in the former Uzbek Research Institute of cotton and its branches in the conditions of a new agricultural system, determining the influence of exchange planting systems on the agrophysical, agrochemical, microbiological characteristics of the soil.

Table 69

Alfalfa-winter wheat-sugar beet of 1945-1953 in Uzbekistan crop rotation system (Data from M.A.Belousov)

Years	1	2	3	4	5	6	7	8	9
1945	Alfalfa	Sugar beet	Winter wheat	Sugar beet	Winter wheat	Sugar beet	Sugar beet	Alfalfa	Alfalfa
1946	Alfalfa	Alfalfa	Sugar beet	Winter wheat	Sugar beet	Winter wheat	Sugar beet	Sugar beet	Alfalfa
1947	Alfalfa	Alfalfa	Alfalfa	Sugar beet	Winter wheat	Sugar beet	Winter wheat	Sugar beet	Sugar beet
1948	Sugar beet	Alfalfa	Alfalfa	Alfalfa	Sugar beet	Winter wheat	Sugar beet	Winter wheat	Sugar beet
1949	Sugar beet	Sugar beet	Alfalfa	Alfalfa	Alfalfa	Sugar beet	Winter wheat	Sugar beet	Winter wheat
1950	Winter wheat	Sugar beet	Sugar beet	Alfalfa	Alfalfa	Alfalfa	Sugar beet	Winter wheat	Sugar beet
1951	Sugar beet	Winter wheat	Sugar beet	Sugar beet	Alfalfa	Alfalfa	Alfalfa	Sugar beet	Winter wheat
1952	Winter wheat	Sugar beet	Winter wheat	Sugar beet	Sugar beet	Alfalfa	Alfalfa	Alfalfa	Sugar beet
1953	Sugar beet	Winter wheat	Sugar beet	Winter wheat	Sugar beet	Sugar beet	Alfalfa	Alfalfa	Alfalfa

The researches were carried out in Fergana, Surkhandarya, Khorezm, Bukhara, Sirdarya, Kashkadarya and Jizzakh branches of the former Uzbek Institute of cotton Research. Experiments are conducted in a single system in all branches, the experimental system is presented in Table 70.

Table 70

Experience system

№	Crop rotation system	Years					
		2000 y.	2001 y.	2002 y.	2003 y.	2004 y.	2005 y.
1	Permanent sugar beet (control)	Sugar beet	Sugar beet	Sugar beet	Sugar beet	Sugar beet	Sugar beet
2	1:1:1:1:2	Winter wheat	Sugar beet	Soy bean	Winter wheat	Cotton	Cotton
3	2:1:1:2	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton
4	1:1:2:1:1	Soy bean	Sugar beet	Cotton-plant	Cotton-plant	Winter wheat	Cotton
5	1:2:1:1:1	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat
6	1:1:1:1:2	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton

On crop rotation of sugar beet in a short system according to data from Fergana the study conducted on the meadow-salt soils of the region, in 2000 the yield of sugar beets was 52,89 t/ha, bean 2,36 t/ha, corn 3,51 t/ha, alfalfa 9,50 t/ha. Of experience 1:1:1:1:2, (winter wheat: sugar beet: bean: winter wheat: 2cotton) when planted after winter wheat, the sugar beet in the alternation planting system root fruit yield to 42,06 t/ha, 2:1:1:2, (2alfalfa: sugar beet: bean: 2 cotton) to 58,57 t/ha when grown after 2 years of quail in the system. Much, 1:1:2:1:1, (bean: sugar beet: 2cotton: winter wheat: cotton) is sown after the bean in the system to 43,60 t/ha. much, 1:2:1:1:1, (bean : 2cotton: sugar beet: cotton: winter wheat) to 41,57 t/ha when sown after 2 years of cotton in the system. Much, 1:1:1:1:2, (winter wheat: sugar beet: winter wheat: bean: 2cotton) to 44.2 t/ha when planted after winter wheat in the system. And in the control option, the yield of sugar beets is planted 4 year in a row to 52,89 t/ha. from 31,12 t/ha. decreased (table 71).

Table 71

Root fruit yield of sugar beet in short-turn planting systems (Fergana region, meadow soils)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 yr.	2002 yr.
1	Sugar beet	Sugar beet	Sugar beet	52,89	42,83	37,1
2	Winter wheat	Sugar beet	Soy bean	3,51	42,06	2,7
3	Alfalfa	Alfalfa	Sugar beet	9,50	13,9	58,57
4	Soy bean	Sugar beet	Cotton	2,36	43,6	3,02
5	Soy bean	Cotton	Cotton	2,47	4,42	3,67
6	Winter wheat	Sugar beet	Winter wheat	3,61	44,2	4,12

In the first year of this experiment, which was conducted on the barren soils of the Surkhandarya region, a field background was prepared, in 2000 sugar beets, autumn vegetables, soy were planted in the field according to the experimental system.

In the control option of the experiment, when sugar beets were sown in one field for 3 years in a row, the yield decreased to 5,1 t/ha. The yield of sugar beets planted after the fall is 77,8-76,15 t/ha in comparison with the control option, an additional yield of 3,55-1,84 t/ha was obtained. In the option planted after the bean, the yield is up to 79,69 t/ha. while sown after 2-year alfalfa, the highest is 86,4 t/ha organized (table 72).

Table 72

Sugar beet in short-turn planting systems root yield (Surkhandarya region, bald soils)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 yr.	2002 yr.
1	Sugar beet	Sugar beet	Sugar beet	76,05	74,29	70,95
2	Winter wheat	Sugar beet	Soy bean	2,79	77,8	1,93
3	Alfalfa	Alfalfa	Sugar beet	8,71	12,54	86,4
4	Soy bean	Sugar beet	Cotton	1,84	79,69	4,46
5	Soy bean	Cotton	Cotton	1,88	4,68	4,7
6	Winter wheat	Sugar beet	Winter wheat	2,88	76,15	4,9

According to the experience of the Andijan region on the soil of the hungry, when sugar beet is sown after the winter wheat, the yield of root fruit is 41,57; 41,47 t/ha after alfalfa 2 years of planted 41,96 t/ha, while sown after the bean, the highest is 43,53 t/ha made up. In the control option, the yield of root fruit in two years is 35,4-39,22 t/ha. although the yield when planted 3 years is up to 36,61 t/ha. decreased (table 73).

Table 73

Sugar beet in short-turn planting systems root fruit yield (Andijan region, hungry grassy soils)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 yr.	2002 yr.
1	Sugar beet	Sugar beet	Sugar beet	35,4	39,22	36,61
2	Winter wheat	Sugar beet	Soy bean	3,94	41,56	2,55
3	Alfalfa	Alfalfa	Sugar beet	84,4	19,5	41,96
4	Soy bean	Sugar beet	Cotton	1,84	43,53	2,88
5	Soy bean	Cotton	Cotton	1,81	3,26	3,01
6	Winter wheat	Sugar beet	Winter wheat	4,16	41,47	5,53

Table 74

Sugar beet in short-turn planting systems Root fruit yield (Bukhara region, meadow alluvial soils)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 ry.	2002 yr.
1	Sugar beet	Sugar beet	Sugar beet	45,2	59,0	46,38
2	Winter wheat	Sugar beet	Soy bean	3,98	70,37	2,52
3	Alfalfa	Alfalfa	Sugar beet	7,45	8,76	66,63
4	Soy bean	Sugar beet	Cotton	2,15	59,75	4,92
5	Soy bean	Cotton-plant	Cotton	2,08	3,75	5,1
6	Winter wheat	Sugar beet	Winter wheat	2,9	59,25	4,13

According to the results of the experiment conducted in the conditions of meadow-alluvial soils of the Bukhara region, when sugar beet was planted in one field itself 2-year, the yield decreased to 6,2 t/ha, when planted 3-year to 8,82 t/ha. The yield of sugar beets planted after the fall is the highest to 70,37 t/ha. while sown after the bean to 59,75 t/ha after 2 years of planted alfalfa 66,63 made up (table 74).

The yield of sugar beet root fruit in the control option of the experiment conducted in the conditions of meadow-gray soils of the Sirdarya region was 36,97 t/ha in the first year, 2 years 19,85 t/ha, 3 years 16,09 t/ha. made up. It was also observed that sugar beets were harvested at 22,95 t/ha when sown after winter wheat, 1,4 t/ha when sown after 2 years of alfalfa, the highest 25,2 t/ha when sown after the bean (table 75).

Table 75

Sugar beet in short-turn planting systems root fruit yield (meadow gray soils of sirdarya region)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	**2001 yr.**	**2002 yr.**	**2000 yr.**	**2001 yr.**	**2002 yr.**
1	Sugar beet	Sugar beet	Sugar beet	36,97	19,85	16,09
2	Winter wheat	Sugar beet	Soy bean	7,03	22,05	0,96
3	Alfalfa	Alfalfa	Sugar beet	7,87	12,67	14,03
4	Soy bean	Sugar beet	Cotton	2,13	25,2	2,47
5	Soy bean	Cotton	Cotton	2,08	2,26	2,23
6	Autumn wheat	Sugar beet	Autumn wheat	7,08	18,7	5,34

According to the data of the experiment conducted in the conditions of meadow-gray soils of the Jizzakh region, the yield of sugar beets in the 1-th year of the experiment was 62,5 t/ha in the control option, 2 year 62,1 t/ha, 3 year 52,3 t/ ha. it was observed that he founded. When sugar beet was grown after winter wheat, it was determined that the yield of root fruit was 68,0 t/ha, after 2 years of alfalfa 60,1 t/ha, after bean to 64,3 t/ha (table 76).

Table 76

Sugar beet in short-turn planting systems root fruit yield (Jizzakh region, meadow gray soils)

Opt.	Short rotation planting system			Crop yields, t/ha		
	2000 yr.	2001 yr.	2002 yr.	2000 yr.	2001 yr.	2002 yr.
1	Sugar beet	Sugar beet	Sugar beet	62,5	62,1	52,3
2	Winter wheat	Sugar beet	Soy bean	4,65	68,0	2,43
3	Alfalfa	Alfalfa	Sugar beet	4,42	12,25	60,10
4	Soy bean	Sugar beet	Cotton	2,45	64,3	3,61
5	Soy bean	Cotton	Cotton	2,59	3,78	3,83
6	Winter wheat	Sugar beet	Winter wheat	4,28	66,2	4,85

According to data from the experience conducted in the conditions of the meadow-alluvial soils of the Khorezm region, its yield has sharply decreased as a result of the consecutive cultivation of sugar beet into a chronic field. In the first year of experience, the yield is up to 35,4 t/ha. in the 5-th year of the experiment, compared to the initial indicator, it reached 8,27 t/ha,while in the 6-th year it reached 16,76 t/ha decreased observed. In the second year of the experiment, when sugar beets are sown after the fall, the yield is up to 41,56-41,47 t/ha in terms of options, while sown after the soy to 43,53 t/ha. made up.

Table 77

Root yield of sugar beet in crop rotation systems
(meadow-alluvial soils, Khorezm region)

opt.	Type of crops by years						Root yield, t/ha	Additional yield relative to control t/ha
	2000	2001	2002	2003	2004	2005		
2000 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	35,4	-
2001 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	39,2	-
4	Winter wheat	Sugar beet i	Soy bean	Winter wheat	Cotton	Cotton	41,51	2,34
6	Soy bean	Sugar beet	Cotton	Cotton	Winter wheat	Cotton	43,53	4,31
8	Winter wheat	Sugar beet	Winter wheat	Soy bean	Cotton	Cotton	41,47	2,25
NSR_{05}-1,019 t/ha, Sx –3,32%; NSR_{05}-1,296 t/ha, Sx –4,26%								
2002 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	36,61	-
5	Alfalfa	Alfalfa	Sugar beet	Soy bean	Cotton	Cotton	44,96	8,35
NSR_{05}-0,787 t/ha, Sx = 2,56%; NSR_{05}-1,247 t/ha, Sx =4,06%								
2003 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	31,01	-
7	Soy bean	Cotton	Cotton	Sugar beet	Cotton	Winter wheat	40,58	9,57
NSR_{05}-1,2 t/ha, Sx =3,95% ; NSR_{05}-0,841 t/ha, Sx =2,76%								
2004 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	27,13	-
2005 yr.								
1	Sugar beet	-//-	-//-	-//-	-//-	-//-	18,64	-

This means an additional yield of 4,31 t/ha in relation to the control option. In the third year of the experiment, the yield of sugar beets planted after two years of alfalfa rest to 44,96 t/ha. the additional yield was 8,35 t/ha. When planted after two years of germination in the next year, the yield is up to 40,58 t/ha. organized (table 77).

Based on the results obtained from experiments on the cultivation of sugar beet alternation, we can conclude that in almost all soil climatic conditions of the Republic, chronic cultivation of sugar beet for 3-4 years in one field leads to a decrease in its yield to 6,0-17,0 t/ha. In order to obtain a high root fruit crop regardless of the climatic conditions of the soil, it is necessary to take 1bean : 1sugar beet : 2cotton: 1winter wheat:1cotton:after sugar beet the crop rotation, 2alfalfa:1sugar beet:1bean:1cotton:system after alfalfa crops ensures quality and high yield.

Cultivation of sugar beet seeds

Planting beet rootstocks planted in the first year is a widely used method of obtaining seeds, transplanting them into the fields for the second year seeds. Seed beets are not recommended to be placed next year in the field where beets are planted. When sown for seeds, the tubers are 60 sm. the range is planted and maintained between. The thickness of the seedlings will also be 160-180 thousand plants hectare, more than the sugar beet planted on an industrial basis. After cooking sugar beets, which are planted for sowing, it is recommended to harvest the air at a temperature not lower than 6-8 degrees. Because, the early harvested root fruit is early sagging, rotting, and after a cold fall, it has a negative effect on the root fruit.

Seeds of rootstocks are planted over 30 sm. buried with soil in thickness. In the spring, after the opening the root fruit is sorted and prepared for planting. If possible, the field should be planted 35-40 tons/ha of manure in the spring. Then the boron is made and the trowel is pressed. Before planting, the annual amount of phosphorus and potassium fertilizers and a portion of nitrogen fertilizers are given.

Feeding sugar beet seeds begins from the period when the stalk of leaves appears and the flower-bearing branches appear. 120-150 kg/ha in nutrition is given nitrogen in pure form.Herbicides against weeds are used on the fields on which weeds are planted beets.

Beet seeds are crushed twice. For the first time leaves and growing branches 10-12 sm. from above it is chopped, the second time 2-3 sm from the top of the branches on the eve of the entrance to the flower. the part will be knocked out. In it, additional branches are formed, seed quality is improved.

Additional pollination of sugar beet with seeds allows an increase in the yield of the extracted seeds. To do this, a long rope is dragged over the field into which the flower enters.

30-40 percent of the seed in the stems is harvested in special tubers when the seed-nuts enter the brown color. When it is twisted in the hand, it is lightly ground into ores and, after drying thoroughly, it is milled in combs. It is also possible to leave sugar beet rootstocks, which are left for seeds in regions where the winter temperature is not so cold, without roasting them in the field this year, so that next year they will grow seeds.

In Central Asia countries, beets, which are planted for seeds, can also be planted from seeds as a repeated crop in the summer. Because, the leaves of sugar beets, planted in the summer, are completely preserved, and also give a not very large root fruit. And such rootstocks are well preserved in winter. Seeds planted in the summer rootstocks from beets are resistant to diseases and give 10 percent more seeds than in the spring.

Experiments on the study of agrotechnics of abundant and high-quality seed cultivation from sugar beet in the conditions of typical gray soils of the Tashkent region were conducted in 2000-2002 y. The soil of the experimental field is a typical gray soil, the mechanical composition of which is heavy sand. The Sizot waters are located at a depth of 18-20 meters. The soil is low in nitrogen and phosphorus, with potassium it is provided by an average norm. The experiment was conducted on 4 repetitions. The row is 60 sm. The area of each piece is 45 m². In the experiment, the parent seeds of sugar beet were planted in the system of three maturing, 1 row paternity, 5 row motherhood. The system of experiments was presented in table 78.

Before plowing the field after harvesting the autumn crop is 100 kg /ha using NRU-0,5. in the amount of phosphorus, 50 kg. potash fertilizers are laid and lightly watered. Then 30-35 sm. with two-layer plugs be driven to the depth. The norm of planting is 10 kg/ha. SPCH-6FS Rumine was used in planting. When planting seeds, the range is between 60 sm. so, 3-5 sm. planted in depth.

Table 78

Experience system

Options	Planting time	Seedling thickness thousand/h	Norm of mineral fetilizers, kg/h		
			N	R	K
1	1.08	90	100	75	50
2			150	105	75
3		110	100	75	50
4			150	105	75
5	1.09	90	100	75	50
6			150	105	75
7		110	100	75	50
8			150	105	75
9	1.10	90	100	75	50
10			150	105	75
11		110	100	75	50
12			150	105	75

At the time when 2-3 pairs of sugar beets extracted from the leaves were single transplanted 90 thousand and 110 thousand seedlings per hectare. Between the series, two cultivations and one manual chop were performed.

According to the information obtained, sugar beets planted on 1 August fully sprouted on 15 day, when sown on 1 September on 21 day, when sown on 1 October on 29 day. The data obtained on 1 September showed that the number of sugar beet leaves planted on 1 August amounted to 6,5-7,1 piece, and on 1 September 5,6-6,1 piece.

Root fruit weight according to information received on 1 September, when sown on 1 August 8,1-8,7 g., 1 October 12,0-17,5 g., when planted on the date of 1 September 10,7-11,7 g. made up.

Sugar beet seeds were brought into the wintering without making it unique. Before winter, the planting thickness of sugar beets is 125,6-143,6 thousand/ha according to the options on a medium scale made up. In the spring sugar beets were unified according to the experimental system. Before harvesting sugar beets, when its planting thickness is calculated (only plants that have seeds ruffles), this indicator is on average 83,0-85,4 thousand/ha. and 105,4-106,0 thousand/ha. made up.

The effect of its planting times on the thickness of the sugar beet seedlings was also determined. According to the data obtained at the end of the validity period, sugar beet seedlings planted at 1.10 were found to have decreased by 4,2-7,4% compared to the thickness of the seedlings at the beginning of the validity period, and 3,6-6,5% compared to the sowing during the previous periods.

The effects of planting periods and different fertilizer standards on plant height, seed mass of 1000 piece and seed yield were also determined. According to the data obtained at the end of the validity period, the height of the plant planted at 1 August is 115,5-140,1 sm., the height of the plant planted within the 1 September term is 109,5-128,7 sm. made up. Mine high norm NPK 150: 105: 75 kg/ha to 12,89 sm in terms of application, it was found that the NPK was 100:75:50 kg/ha while the options applied to 115,5-126.5 sm. 1000 piece of seed mass in sugar beet planted in the early term 1,7-2,0 g. from 1000 piece of seed mass of sugar beet planted in the late term a month it was observed that it was heavy (table 79).

The fact that sugar beet seedlings have a thickness of 90 thousand/ha also ensured that the seeds are large and of good quality. For example, 1 August in the second option, when planted in the term, was applied to NPK 150:105:75 kg/ha and has a seedling of 90 thousand/ha, the weight of 1000 pieces of seeds is the highest - 14,8 g. showed the indicator.

In other data obtained on plant growth and development, the above legislation was also observed.

Judging by the data obtained on the seed yield of sugar beets, the highest yield was observed in the 4-th option of the experiment. In this sugar beet was sown in the period of 1.08, when NPK was 150: 105: 75 kg/ha and seed yield was 110 thousand hectare of seed thickness 1.42 t/ha. In the experiment, the minimum seed yield was observed in the 7-th option to 1,27 t/ha. (Table 80).

In the third period of the experiment, the specified planting thickness was not obtained, since the sugar beet seeds that were planted did not come out well from the wintering.

Field experiment conducted in the conditions of meadow-salt soils of the Fergana region consisted of 6 options, 4 repetitions, and was conducted on 4 yaros. The area of each section is 192 m², the total area is 0.80 ha. made up.

After the winter wheat harvest, instead of sugar beet seeds and seedlings were planted the stubble was watered. Then he was plowed into the fertilizer using NRU-0,5. After the drive, the land was leveled and made harrow. Before planting, the trowel is pressed, and then with in the time limits specified in the application, the sugar beet R-032 grade is using the Romanian seyalka SPCH-6-FS. Turn, 10-12 kg/ha 3 sm. the range at a depth of 60 sm. planted. During the period of operation, the planting thickness of sugar beet was an average of 57.1 thousand /ha.

According to the data obtained, the highest sugar beet seed yield was obtained in the 2-th optain of the experiment, that is in the 15.08 term the seed was planted 3,01 t/ha. The yield of sugar beet seeds planted at 5.09 is 2,55 t/ha, 15.09 when planted at 2,14 t/ha, 5.10 planted at 2,07 t/ha. made up. In the case of root fruit, the yield is planted in the spring, when the seed is grown to 1,12 t/ha. made up (Table 81).

So, when growing sugar beet seeds, planting it from seeds is considered an optimal method.

Table 79

**Growth and development of sugar beet in seeds
(Tashkent region, typical gray soils)**

№	Number of leaves, piece		Root mass, g.			Plant height, sm.		
	1.09	1.10	1.09	1.10	1.11	In the tube	In the flowering	In the cooking
1	6,5	19,7	8,5	12,0	27,5	47,4	97,5	126,5
2	7,2	21,2	8,1	17,5	53,6	49,1	114,5	140,1
3	7,1	20,8	8,3	14,5	31,7	41,3	92,4	115,5
4	7,0	24,5	8,7	14,8	29,3	45,8	101,8	128,9
5	-	5,6	-	10,7	21,4	17,5	85,6	114,8
6	-	5,7	-	11,5	11,4	20,8	98,5	124,0
7	-	6,1	-	10,1	13,5	21,7	81,0	109,5
8	-	5,9	-	11,7	3,3	28,6	93,8	128,7
9	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-

Table 80

**Seed sugar beet growth, development and yield
(Tashkent region, typical gray soils)**

№	Seedling thickness, Before winter pasture,thousand/h.	Seedling thickness, After winter pasture, thousand/h.	Seedling thickness, before packing thousand/h.	1000 seed weight, g.	Seed yield, t/ha
1	137,0	91,3	85,4	14,3	1,17
2	129,3	90,1	84,4	14,8	1,21
3	135,0	110,6	106,0	13,7	1,38
4	143,6	109,3	105,4	14,0	1,42
5	125,7	91,0	84,3	13,2	1,07
6	125,6	90,7	83,0	13,6	1,11
7	121,8	110,0	105,4	12,7	1,28
8	128,7	110,8	105,7	13,0	1,34
9	-	-	-	-	-
10	-	-	-	-	-
11	-	-	-	-	-
12	-	-	-	-	-

Table 81

**Sugar beet seed yield
(Fergana region, meadow soils)**

Options	Planting time	Repetitions, t/ha				Average seed yield t/ha
		I	II	III	IV	
1	10.04 (Planted from the root)	1,02	1,18	1,21	1,09	1,12
2	15.08 (Planted from seed)	2,99	3,03	3,09	2,94	3,1
3	5.09 (Planted from seed.)	2,34	2,24	2,94	2,07	2,55
4	15.09 (Planted from seed)	2,29	2,02	2,17	2,18	2,14
5	5.10 (Planted from seed)	2,23	2,0	1,91	2,13	2,07

Ecological testing of sugar beet varietes

The research was conductedin 1999-2002 in the conditions of meadow-alluvial soils of Khorezm region. In the study scientific research was conducted on 7 varietes of sugar beet. The experimental system is given (table 82).

Table 82

Experience system

№	Varieties type	Planting norm, kg/ha.
1	Romonskaya-032 (Ukraina)	5-6
2	Viktoria (Moldavia)	2-3
3	Turkey (Turkey)	2-3
4	KVS “Sonya” (German)	1,5-2
5	Gelya (Isroil)	1-2
6	Kranodarskaya-saharnaya (Russian)	4-5
7	Drujba (Russian)	4-5

The main goal of the experiment is to recommend the selection and production of new varieties of sugar beet, resistant to diseases and pests, giving a high and high-quality harvest, the content of which is not less than 18-20%.

The experiment was conducted on the basis of a guide issued for the state sort test areas, the total area of each option was 90 m², of which the calculation area was 45 m².

According to the data obtained, among the varieties of sugar beets tested, the highest root fruit crop is found in “Krasnodar-sakharnaya” and “Druzhba” varieties of the Russian Federation, the yield of which is 42,5-44,5 t/ha. made up. Even on the sugar level, the “Krasnodar-sakharnaya” variety showed a high result, it became known that the sugar level was an average of 20,6%. The minimum root fruit yield in these varieties was observed in the varieties” Victoria “and” Turkey " -26,26-37,83 t/ha. Hence, the planting of the “Krasnodar-sakharnaya” and “Druzhba” varieties for cultivation in production under the conditions of meadow-alluvial soils of the Khorezm region provides a high and high-quality harvest (table 83).

Table 83

The level of yield and sugar content of sugar beet varieties (Khorezm region, meadow alluvial soils)

№	Varieties	Seedling thickness, thousand/h.	Number of leaves,piece	Root mass, g.	Root diameter sm.	Root length, sm.	Sugar degree, %	Root yield, t/ha.
1	**R-0.32**	56,5	25	710	9,7	19,6	20,4	38,73
2	**Victoria**	56,7	30	615	9,8	23,2	18,6	26,26
3	**Turkey**	62,0	31	690	9,9	24,5	19,5	37,58
4	**KVS-sonia**	62,4	24,5	720	11,5	23,7	19,1	39,67
5	**Gelia**	70,5	26	700	10,3	21,4	18,8	37,83
6	**Kranodar**	83,1	26	815	10,5	19,7	20,6	42,5
7	**Drujba**	86,3	22,5	856	9,5	20,8	18,7	44,5

The fight against sugar beet pests and diseases

More than 250 species of beetles in sugar beet can be dangerous. 43 of them are very dangerous. Therefore, the use of timely measures of struggle against insects gives good results.

The main pests of sugar beet are autumn night, caradrina, beet moth, leaf bit, sturgeon and beet leaf. It is necessary to apply measures to combat such insects mainly agrotechnical and biological. Quality work before planting the soil, planting in their own terms, timely loosening of the range, fertilizing, etc. Are considered one of the main agrotechnical measures. Biological fighting measures include the reproduction of birds of various insects, the distribution on the sugar beet fields, the use of deceptive baits.

When insects appear from the cover, and there is a risk of damaging the crop to the cover, chemical fighting measures are used. In this from 25 percent preparation “Ambush” 1 kg/ha or 50 percent preparation “Boloton” 2,5 kg, from 5 percent preparation “Karate” 0,15 kg, from 2,5 percent preparation “Detsis” 0,25 kg, from the drug “Foliton” 0,6 kg. it is applied. Against spiders, leaf burrs and other sucking insects, 25 percent of the drug “Anito” hectare is 1,2 kg, 25 percent of the drug “Ambush” is 0,4 kg, 5 percent of the drug “Karate” is 0,15 kg. used.

In the conditions of Uzbekistan, such diseases as root rotting, flour dew and monilopsis of sugar beet are common. These diseases are mainly caused by poor quality work and improper care of the range of beets. Of the viral diseases of sugar beets, the most common - leaf yellowing is considered, and if the plant is infected with this disease, the yield will decrease by 40-60 percent. The disease is mainly spread by plant lice. Therefore, with insecticides ishlangan the seeds do not fall into the plant until the seeds are sprouted and form 6-7 petals. Such insecticides include preparations “Carbofuran”, “Scooter” or “Gaucho”. Flour, which distributes fungi, rust and other diseases, is sprinkled on one hectare, mixing “Derazol” 0,3 liters of the into 300 liters of water. Measures for the chemical fight against viral and fungal diseases give good results if they are carried out immediately after the appearance of the first symptoms of the disease.

Pick up the harvest

When the sugar beet ripens, the leaves begin to turn yellow and dry, large leaves disappear and small leaves are formed. This period begins in middle September and falls on October. Sugar beet is lightly watered so that it is easy to cook before frying a week.

Sugar beet harvest is harvested using special mexanizm 6-Row “L-6” branded beet harvester and “MRF-6” increasing beet harvester, which increases the price. The harvest should be harvested without getting cold. Because, when the soil temperature is minus 5-6 degrees, the sugar content in the root fruit can decrease.

After the extraction of sugar beets, it is necessary to clean as much as possible from the soil and clay that has stuck. Then the stem part diameter 0,5-1,1 sm. from the edge is cut out. It is desirable to remove the leaf or head part of the beetroot in the form of a bark, with the addition of leaves with buds from the upper sleep.

It is forbidden to shave the head part in the correct form. Because, in this case, along with the loss of yield by 10-13 percent, the rate of its preservation also drops sharply. Sugar beet can lose its weight up to 5-18 percent if stored incorrectly on the dates of its extraction. Therefore, digging, cleaning, scraping work should be carried out in the oven.

In the factories are roasted, cleaned, peeled beets are sorted, soaked, separated from the beaten, separately made stacks up to 3-5 thousand tons.

Beet stacks in the field should be covered with cane, beetroot. If the air temperature is high, then close handles need to be moistened. The harvest is sent from here to the right factories or factories. If long-term storage in field conditions is necessary, special caves are created on the ground near the main road. The lower part of such caves should be 2,0-2,5 meters, the upper part 0,25-0,50 meters, the height 1,20-1,40 meters. The length of the stacks is depending on the amount of harvest. The sides of the cave are closed with moist soil with a thickening of 20-25 sm.

Conclusions

1. Soil fertility is the bar of abundant and high-quality crop cultivation in agriculture, soil fertility is gradually decreasing in irrigated areas of our country, lands whose quality is higher than average and average are reduced by 10%, on average, areas that are lower than average are increased by 12,4%, exchange planting is not sufficiently introduced, organic fertilizers are poorly used, humus and deterioration of agrochemical, agrophysical, meliorative status, negative processes are observed, such as weeds, pests and diseases, a decrease in microbiological and other characteristic features. This situation remains the main obstacle in increasing the level of agricultural production.

2. In order to increase the total amount of cotton without observing the natural fertility of the soil when planting swapping buds, incorrect systems of swapping plants based on cotton singularity such as 3:6 (3 years alfalfa 6 years cotton), 3:7 (3 years alfalfa 7 years cotton), 3:9 (3 years alfalfa 9 years cotton) have been established. In these systems, the capacity of soil fertility reached only 3, 4 years after the alfalfa for the quality and abundant harvest of cotton, and the cultivation of cotton even in 5, 6, 7, 8 and 9 years after the alfalfa led to an extreme decrease in soil fertility, a violation of the ecological balance. According to economic analysis, the system of crop rotation does not yield economic benefits in the current new agricultural system.

3. In the case of chronic cotton planting (monoculture) fertilizer-free care, the amount of humus in the soil tillage layer was tested in 50-70 years (1976-1996 y.) compared to the initial (1926 year) 34,4% -39,3%, 80-th year (2006 y.) went and it was found that it decreased by 54,3%. Also, the total amount of nitrogen is 47,7% - 50,4% and 61,7% respectively, when applied to NPK 150:100:50 kg/ha, respectively, the amount of humus is 19,8%; 29.4% as well as 31.7%, the total amount of nitrogen is 27,5%; 38,6% and 45,7%, and in the option given 30 t/ha under the dew%; 1,8%) decreased to 6-8% in the next 20 years. In the system of crop rotation 3:7 (alfalfa: cotton), the cotton planted after 3 years of alfalfa is 1, 2, 3 - th year yield on average 3,0-3,2 t/ha., while in 4, 5, 6, 7 - th years, decreased by 2,8-2,3 t/ha. it was noted that

the was founded. So, based on the data obtained from 90 years of monoculture experience, one can conclude that if soil fertility is not managed scientifically, then it will definitely decrease. Therefore, in order to ensure soil fertility, to maintain the law of return on soil and to ensure sustainable yields, it is necessary to develop and implement in practice short-turn crop rotation systems based on science suitable for each soil-climatic region of the Republic. A sharp change in the structure of arable land, a reduction in the area of the clover crop rotation system necessitates wide introduction into the production of short-turn crop rotation systems that restore, preserve and increase soil fertility in the Republic.

4. In the system of crop rotation 2:1 (winter wheat+ repeated crop-beans : winter wheat + repeated crop-beans + intermediate crop-rye) 12.43 – 16.80 tons hectare, in total on account of only winter wheat, repeated and intermediate crops 1 : 1:1 (winter wheat + repeated crop + intermediate crop-triticale:soy bean : cotton and winter wheat + repeated beans : cotton: soy bean) in the system of crop rotation it was determined that 12.09 -16.09 tons of root and stubble remained. As a result of the decay and decomposition of some of these residues in the soil, it was observed that the bulk mass of the soil in the subsurface layers of typical gray, tairim and meadow-alluvial soils decreased, the amount of water-resistant aggregates increased, while the water permeability of the soil increased by soil types.

5. The amount of nitrogen, phosphorus, potassium in the root of the repeated mash, respectively 1,46%; 1,0%; 1,05%; 0,416% nitrogen in the root of the autumn tree, 0,157% phosphorus, 0,217% potassium, 0,214% nitrogen, 0,126% phosphorus, 0,146% potassium grown in the systems of short-turn planting; 1,46%; 1,0%; 1,05%; 1,29%; 0,32%; 1,6%;, in the intermediate crop triticale root 0,363%; 0,145%; in angi 0,277%; 0,107%; in the soy root 1,29%; 0,37%; the presence of 1,6% was determined. The maximum amount of nitrogen, phosphorus, potassium in the soil by root and stubble residues, nodular bacteria return to the soil by alternation of 2:1 (winter wheat+repeated beans:winter wheat+repeated beans+intermediate crop rye cotton) and 1:1:1 (winter wheat + repeated beans + intermediate crop tritikale : cotton + intermediate crop tritikale : bean) observed in the systems, this nitrogen 181,8

kg/ha, phosphorus 67,2 kg/ha, potassium 112,3 kg/ha. made up. As a result, the amount of humus in the soil, respectively, according to the systems, is 0-30 sm. in the layer to 0,045%, the total nitrogen content to 0,028% and 0,024%; 0.013%,it was proved that a gradual positive solution to the law of return on soil by planting legumes-cereals, legumes and intermediate crops in short-rotation alternation planting systems, this increasing can maintain soil fertility.

6. In short-turn systems of crop rotation, repeated legumes after the fall-cereals, intermediate crops, intermediate crops after the cotton, soy bean cultivation as the main crop, positively affected the activity of microorganisms in the soil and the microflore of the soil. As a result, it was determined that the number of useful fungi, bacteria in the soil increased by 1,7-2,3 times, the number of ammoniferous, azotobacterial and oligonitrophilic micro organism by 1,1-1,5 times, and the number of denitrifying micro organism by 2-3 times. This condition reduces the absorption process of humus, nitrogen and organic substances in the soil, creating conditions for greater accumulation of carbon and nitrogen-containing organic substances, creating a positive microbiological environment in the soil.

7. As the main crop in various crop rotation systems, applied in all soil-climatic conditions conducted studies have decreased by 3-4% to be the death of seedlings in the cotton planted after them as a result of planting legumes-cereals as a repeated crop and intermediate crops, so on account of 0.13-0.16 t/ha. it was determined that an additional crop could be obtained. Also, there was a positive effect on the growth and development of the larynx, the larynx was 17,3-15,1 sm. more than the control, the number of the larynx was 2,1-1,6 pieces. The result is typical gray soils 2:1 (winter wheat+repeated beans:winter wheat+repeated beans+intermediate crop rye : cotton) in the system of the cotton to 0.5 t/ha, 1:1:1 (winter wheat+repeated beans+intermediate crop triticale : cotton:soy bean) in the system of 0.61 t/ha, meadow-alluvial and tilted soils 1:1:1 (winter wheat + repeated beans : cotton + intermediate crop triticale : in the bean system, an additional harvest of 0.31-0.32 t/ha was achieved, respectively.

8. Short-turn exchange of "Akdarya-6" varieties of cotton in the conditions of

typical gray soils(2:1, 1:1:1, 1:1) fiber output in the cultivation after the main crop (bean), repeated legumes-cereals (beans) and intermediate crops (rye, triticale)in the systems is 1,2-1,5% compared to the control, fiber length 0,8-2,1 mm. on top, the mass of 1000 pieces of rye is 6,8-13,4 g. increased observed. These legalities were also noted in the "Khorezm-127" varieties of cotton planted on meadow-alluvial soils, and in the "Bukhara-6" varieties planted on barren soils.

9. In the short-turn 2:1 (winter wheat+repeated beans:winter wheat+repeated crop-beans+intermediate crop rye : cotton) system, repeated crop-beans is planted after the fall, which has a positive effect on the growth and development of the winter wheat, the additional grain yield is up to 0.67-0.91 t/ha compared to the control swapped sowing 1: 1 to 0.33-0.54 t/ha when swapped with a grain in the system made up. As a result of grain sowing on the soil, the grain yield decreased to 0.49-1.67 t/ha on typical coarse soils, 0.2-0.25 t/ha on meadow-alluvial soils, 0.25-0.3 t/ha on fertile soils. So it is possible to plant it in one field two years in a row, if necessary, in the fate of which repeated legumes-grain crops are planted in the autumn root.

10. Economic efficiency when using the cotton in the norms of NPK 250:175:125 kg/ha and 150:100:50 kg/ha respectively 149250-95700 sum/ha, when fertilizing to 30 t/ha each year, the highest yield in the care of the alfalfa-cotton after the quail in the swapped planting system 3:7, 2-3-4 years (204900-255300-249000 sum/ha).

The highest economic efficiency in short-turn crop rotation systems corresponding to the conditions of farmer farms in the conditions of market economy in typical gray soils 2:1 (winter wheat + repeated beans : winter wheat + repeated beans + intermediate crop rye : cotton) in the system 827050 sum/ha, in typical and barren soils 1:1:1 (winter wheat+ repeated beans + intermediate crop triticale : cotton + intermediate crop triticale: soy bean) money; it was determined that it was up to 1284400 sum/ha, in meadow-alluvial soils it was up to 377950 sum/ha in the system 1:1:1 (winter wheat+ recurrent beans + intermediate crop-triticale : soy bean).

Based on the results of numerous studies conducted on the technology of cultivation of sugar beets in different soil climatic conditions of the Republic and its alternation, it is possible to draw the following conclusions:

11. In order to ensure food security in the country, to meet the demand for sugar and sugar products, to reduce the volume of sugar imported from abroad and to organize its production in ourselves as much as possible, the establishment and selection of sugar beet varieties with high sugar content, high sugar content, resistant to diseases and pests, considering the increasing number of, the continuation of the research work on further improvement of the technology of quality crop production is also required to make recommendations to the practice. After all, the climatic conditions of our republic are very favorable for obtaining a rich and high-quality harvest from it.

12. In the northern and middle zones of the Republic, as well as in the regions of Tashkent, Samarkand, Sirdarya, Namangan, Fergana, as well as in the mountainous regions of Andijan region and in the soils of Jizzakh, Kashkadarya, Bukhara regions, autumn plow 30 sm, in the soils of layer of Andijan region, in the soils of layer of Surkhondarya region 35 sm, in on the soil of a hungry 42-45 sm. softened to a depth of 28-30 sm. it is desirable to drive the rolled out at a depth of 50-60 sm, as well as on saline meadow soils, the upper part of which is a layer of at a depth of half a meter, and all heavy-grained areas with dense layers of haddock bottom softened to a depth of 28-30 sm, and the upper layer Taking into account the fact that the main part of the irrigated areas of the Republic of Karakalpakstan, Khorezm, Sirdarya, Bukhara regions consists of saline soils, it is necessary to conduct plowing as soon as possible, without freezing the land, to attach importance to the plain or unevenness of the field, its location, soil type and the type of crops of the past, driving at depth is required 3 corpuscual (PYa-3-35) plug 35-40 sm. The conduct of salt washing on saline soils is carried out in the order prescribed by our scientists.

13. The varieties of sugar beet “Krasnodarskaya-sakharnaya” and "Druzhba" are suitable for the conditions and climate of alluvial soils of the meadow of the Khorezm region, ensuring a high and high-quality harvest.

14. In order to obtain a rich and high-quality seed crop from sugar beet, it can

be harvested from its seeds (the seed can also be planted root fruit) in the conditions of typical gray soils of the Tashkent region on August 1, in the meadow gray soils of the Fergana region on August 15, 10 kg/ha. planting from 110 thousand/ha to NPK 150:105:75 kg/ha in the thick of the seedling is recommended for maintenance of feeds normalized.

15. The sooner sugar beets are sown, the healthier the plant, more energetic and fertile. Therefore, in different soil and climatic conditions of the Republic it is desirable to start planting with the cultivation of soil in early spring. It is desirable to plant in the North-Karakalpakstan Republic and Khorezm regions of the Republic, as well as in the northern part of Bukhara region for planting periods of 25.03-05.04, in the central regions-Tashkent, Sirdarya, Jizzakh, Samarkand, Navoi regions and the southern part of Bukhara, in the Fergana Valley 20.03-30.03, in the southern regions-Kashkadarya and Planting periods can be 5-7 days late or early, depending on the arrival of spring.

16. In order to obtain a rich and high-quality harvest of sugar beets, its planting thickness is 110 thousand hectares in the regions of Tashkent (typical gray soils), Kashkadarya (bald soils), Samarkand (meadow gray soils), Khorezm (meadow alluvial soils), Namangan (hungry gray soils), Bukhara (meadow alluvial soils), Fergana (meadow gray soils) and Jizzakh (meadow gray soils). in the regions should be 90 thousand /ha of soil.

17. In order to increase the efficiency of mineral fertilizers in the care of sugar beets, as well as to obtain high-quality root fruit crop from beet, in the feeding of sugar beets in the conditions of typical gray of Tashkent and Namangan regions, of meadow gray of Bukhara and Samarkand regions, NRK 150:100:75 of mineral fertilizers in the conditions of barren soils of Kashkadarya region, Andijan region meadow gray and Khorazm region meadow alluvial the application of NRK 200:140:100 kg/ha, in the conditions of the soils of the Fergana region meadow norm up to NPK 250:175:125 kg/ha provides abundant and high-quality harvest.

18. In the irrigation of sugar beets irrigation procedure in the conditions of bald soils of Kashkadarya region is 75-75-75% humidity, irrigation system is 3-3-2 (from

3 times in leaf and root fruit development periods, irrigation standard is 650-900 m³/ha, during sugar harvesting 2 times, 700-750 m³/ha), irrigation procedure in the conditions of typical gray soils of Tashkent region is 75-75-70% the norm is recommended to irrigate to 800-900 m³/h, root fruit 5 times during the period of development, to 900-1200 m³/h, during the period of sugar harvesting 2 times, to 700-800 m³/h).

19. Swapping sugar beet when planting it 2:1: 1:2 (2alfalfa : sugar beet : soy bean 2:cotton:cotton 33.4%, alfalfa 33.4%, soy bean 16.6%, sugar beet 16.6%) after the alfalfa in the short-turn swapping planting system, 1:1:2:1:1 (soy bean: sugar beet: 2cotton,winter wheat, cotton:cotton: 50,0%, wheat 16.7%, soy bean 16,7%, sugar beet 16,6%) in the system, the cultivation after the soy bean ensures the preservation of soil fertility, high and high-quality harvest from sugar beets.

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A P P L I C A T I O N

1-application

For districts of Tashkent region specializing in cotton groving:

a) 1 winter wheat+repeated crop (beans , soy bean, legume):1 cotton:1 soy bean:2 cotton:1 winter wheat+repeated crop (beans, soy bean, legume):1 vegetables : 1 winter wheat+repeated crop (beans, soy bean, legume):1 cotton, 9 weight of field crops: cotton -44,4%, winter wheat-33,3%,soy bean-11,1%, vegatebles, kaleyard, potatoes-11,1%

Years	Fields									
	I	II	III	IV	V	VI	VII	VIII	IX	X
2010	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop
2011	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton
2012	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean
2013	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton
2014	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton
2015	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop
2016	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop	Vegetables
2017	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton	Winter wheat+repeated crop
2018	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Cotton	Cotton	Soy bean	Cotton	Winter wheat+repeated crop	Cotton

2- application

b) 1 cotton +intermediate crop (rye, tritacale, shabdar, bersim, raps, perko) :1 vegatables:1 winter wheat+repeated crop (beans, soy bean, legume):2 cotton + intermediate crop (rye, tritacale, shabdar, bersim, raps, perko):1 winter wheat+repeated crop (beans,soy bean, legume):, 6 weight of field crops: cotton— 50%, winter wheat— 33,4%, vegetables— 16,6%

Years	Fields					
	I	II	III	IV	V	VI
2010	Cotton + intermediate crop	Winter wheat+repeated crop	Cotton	Cotton + intermediate crop	Winter wheat+repeated crop	Vegetables
2011	Vegetables	Cotton + intermediate crop	Winter wheat+repeated crop	Cotton	Cotton + intermediate crop	Winter wheat+repeated crop
2012	Winter wheat+repeated crop	Vegetables	Cotton + intermediate crop	Winter wheat+repeated crop	Cotton	Cotton + intermediate crop
2013	Cotton + intermediate crop	Winter wheat+repeated crop	Vegetables	Cotton + intermediate crop	Winter wheat+repeated crop	Cotton
2014	Cotton	Cotton + intermediate crop	Winter wheat+repeated crop	Vegetables	Cotton + intermediate crop	Winter wheat+repeated crop
2015	Winter wheat+repeated crop	Cotton	Cotton + intermediate crop	Winter wheat+repeated crop	Vegetables	Cotton + intermediate crop

3- application

The Parkent, Bostanlyk, Akhangaron district of Tashkent region speacializing in cereals and vegetables:a) 1 leguminous crops: 2 winter wheat+repeated crop (beans, bean, legume): 1 potatoes: 1 winter wheat+repeated crop (beans, bean, legume):1 vegetables, field 6 weight of field crops: winter wheat-50%, vegetables, field-16,6%, potatoes -16,6%

Years	Fields					
	I	II	III	IV	V	VI
2010	Leguminous crops	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop
2011	Winter wheat+repeated crop	Leguminous crops	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop
2012	Winter wheat+repeated crop	Winter wheat+repeated crop	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Potatoes
2013	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops	Vegetables	Winter wheat+repeated crop
2014	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops	Vegetables
2015	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops

4- application

The Parkent, Bostanlyk, Akhangaron district of Tashkent region speacializing in cereals and vegetables: a) 1 leguminous crops:2 winter wheat+repeated crop (beans, bean, legume): 1 potatoes: 1 winter wheat+repeated crop (beans, bean, legume): 1 vegetables, field 6 weight of field crops: winter wheat -50%, vegetables, field -16,6%, potatoes -16,6%

Years	**Fields**					
	I	**II**	**III**	**IV**	**V**	**VI**
2010	Leguminous crops	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop
2011	Winter wheat+repeated crop	Leguminous crops	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop
2012	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops	Vegetables	Winter wheat+repeated crop	Potatoes
2013	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops	Vegetables	Winter wheat+repeated crop
2014	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops	Vegetables
2015	Vegetables	Winter wheat+repeated crop	Potatoes	Winter wheat+repeated crop	Winter wheat+repeated crop	Leguminous crops

5- application

For areas with moderate,moderate and weak salinity of soil fertility of the Republic soil quality score of 41-60 points: 1 winter wheat+repeated crop (beans, soy bean, legume)+ intermediate crop (rye, tritacale) : 2 cotton: 1 winter wheat+repeated crop (beans, soy bean, legume) : 1 soy bean, 1 cotton, 6 weight of field crops: cotton -50,0%, winter wheat-33,3%,soy bean-16,6%

Years	Fields					
	I	II	III	IV	V	VI
2010	Winter wheat+repeated crop	Cotton	Soy bean	Winter wheat+repeated crop	Cotton	Cotton
2011	Cotton	Winter wheat+repeated crop	Cotton	Soy bean	Winter wheat+repeated crop	Cotton
2012	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Soy bean	Winter wheat+repeated crop
2013	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Soy bean
2014	Soy bean	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Cotton
2015	Cotton	Soy bean	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop

6- application

For areas with low soil fertility of the Republic low-salinity soil quality score 21-40 points: 1 winter wheat : 2 alfalfa : 3 cotton: 1 winter wheat: 1 cotton: 1 soy bean, 9 weight of field crops: cotton -44,4%, winter wheat-22,2%, alfalfa 22,2%, soy bean-11,1%

Years	Fields								
	I	II	III	IV	V	VI	VII	VIII	IX
1	Winter wheat	Soy bean	Cotton	Winter wheat	Cotton	Cotton	Cotton	Alfalfa	Alfalfa
2	Alfalfa	Winter wheat	Soy bean	Cotton	Winter wheat	Cotton	Cotton	Cotton	Alfalfa
3	Alfalfa	Alfalfa	Winter wheat	Soy bean	Cotton	Winter wheat	Cotton	Cotton	Cotton
4	Cotton	Alfalfa	Alfalfa	Winter wheat	Soy bean	Cotton	Winter wheat	Cotton	Cotton
5	Cotton	Cotton	Alfalfa	Alfalfa	Winter wheat	Soy bean	Cotton	Winter wheat	Cotton
6	Cotton	Cotton	Cotton	Alfalfa	Alfalfa	Winter wheat	Soy bean	Cotton	Winter wheat
7	Winter wheat	Cotton	Cotton	Cotton	Alfalfa	Alfalfa	Winter wheat	Soy bean	Cotton
8	Cotton	Winter wheat	Cotton	Cotton	Cotton	Alfalfa	Alfalfa	Winter wheat	Soy bean
9	Soy bean	Cotton	Winter wheat	Cotton	Cotton	Cotton	Alfalfa	Alfalfa	Winter wheat

7- application

For areas soilfertility of the republic with poor salinity soil points quality 61-80 poits: 1 winter wheat+repeated crop (beans, soy bean, legume): 2 cotton: 1 soy bean : 1 winter wheat+repeated crop (beans , soy bean, legume) : 1 vegetables : 1 winter wheat+repeated crop (beans, soy bean, legume) : 2 cotton, 9 weight of field crops: cotton -44,4%, winter wheat-33,3%, soy bean-11,1%, vegetables-11,1%

Years	Fields								
	I	II	III	IV	V	VI	VII	VIII	IX
1	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton	Cotton
2	Cotton	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton
3	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean
4	Soy bean	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop
5	Winter wheat+repeated crop	Soy bean	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop	Vegetables
6	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Cotton	Winter wheat+repeated crop
7	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton	Cotton	Winter wheat+repeated crop	Cotton	Cotton
8	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton	Cotton	Winter wheat+repeated crop	Cotton
9	Cotton	Cotton	Winter wheat+repeated crop	Vegetables	Winter wheat+repeated crop	Soy bean	Cotton	Cotton	Winter wheat+repeated crop

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