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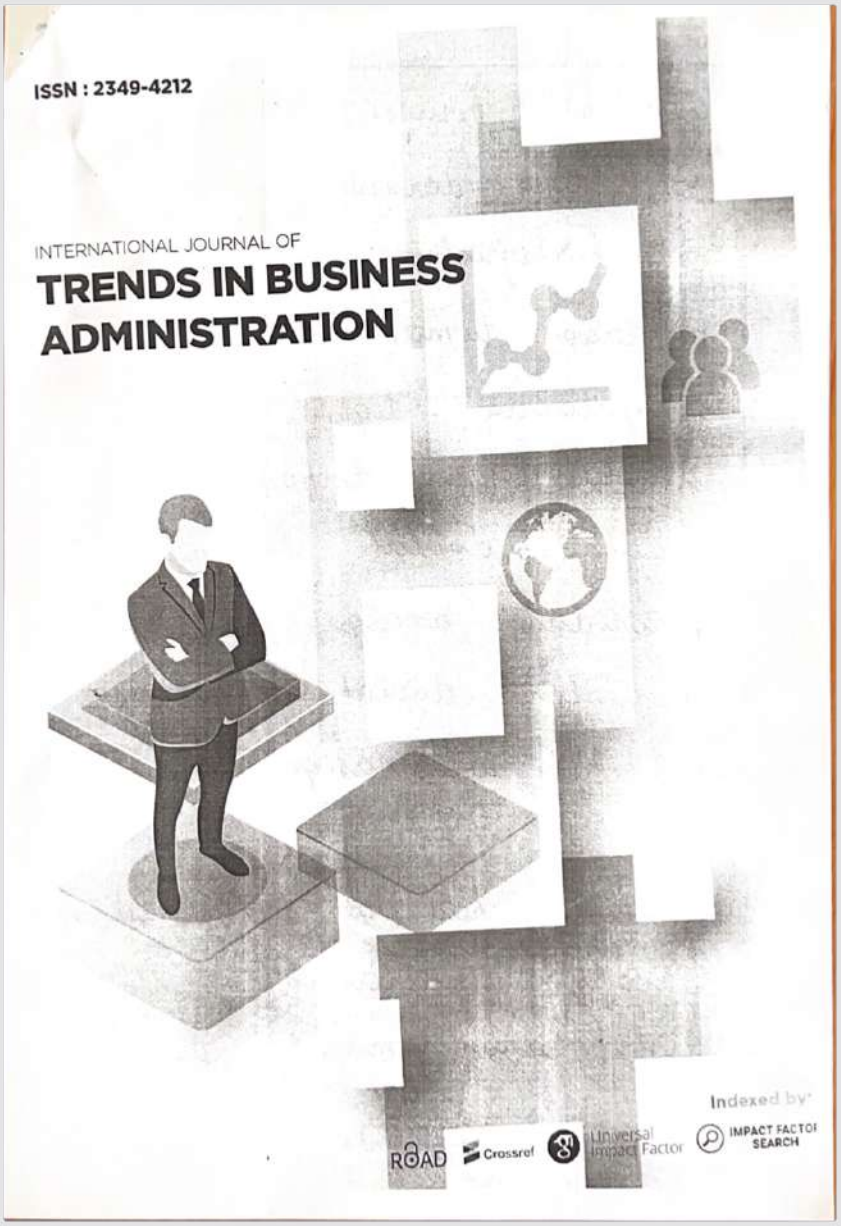

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IMPROVEMENT OF THE REPRODUCTION CYCLE OF HOUSEHOLD AND DEHKAN FARMS

Ashurov Abdullo Faizulloevich - senior lecturer,
Saydalieva Guzal Abdurashidovna – assistant National Research University "Tashkent Institute of Irrigation and Agricultural Mechanization Engineers", Uzbekistan.

Abstract: The article discusses the issues of reducing soil fertility as a result of growing crops in the lands of household and dehkan farms, ways to prevent this process, ways to restore soil fertility. The land, when properly used, restores its productive properties. It is recommended to sow alfalfa widely used in the districts of the Surkhandarya region and on the lands of dehkan farms, which contributes to a significant enrichment of soils with humus and improve their structure to provide animal feed.

Keywords: productivity, appraisal, crop rate, humus, pole acrylic, cartogram, crust for-ming, meliorate, pesticide, soil, porosity.

Introduction.

When growing crops in the lands of dehkan and household plots, the decrease in soil fertility is an objective natural process, if the relevant scientifically based rules are not observed. The land, when properly used, restores its productive properties. It is recommended to sow alfalfa widely used in the districts of the Surkhandarya region and on the lands of dehkan farms, which contributes to a significant enrichment of soils with humus and improve their structure to provide animal feed.

This work is devoted to solving the following issues:

- development of organizational and economic foundations for improving the efficiency of land use of household and dehkan farms;
- establishment of the soil quality score for land plots of household and dehkan farms, since they were not determined;
- management of soil fertility in the land use of dehkan and household plots;
- determination of scientifically grounded rules for increasing soil fertility;

To establish the state of soil fertility of the lands of household and dehkan farms, materials of agrochemical cartograms compiled in 1991 to 2017 by the Surkhandarya zonal agrochemical laboratory were used.

The experiments carried out in the Surkhandarya agrochemical laboratory in 1991 to 2017 show that with the permanent sowing of the same plants, the humus content decreased to almost 1%. The alfalfa crops widely used in the districts of the Surkhandarya region and on the lands of household and dehkan farms contribute to

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a significant enrichment of soils with humus and improve their structure to provide animal feed. An effective technique for increasing the fertility of poorly structured irrigated gray soils is the artificial structuring of their introduction of polymers - semi-acrylamide. In small doses (15-30 kg per 0.1 ha.), these preparations significantly improve the structure (by 15-20% of the previous level), contribute to the creation of a loose, well-permeable and breathable arable layer, reduce water loss through evaporation and eliminate crust formation. Plant yields with artificial soil structuring increase by 15 - 20%, and the growth and development of plants is accelerated.

1) The process of reducing soil fertility in the cultivation of agricultural crops and in the lands of dehkan and household plots is an objective natural process. The level of fertility is not something invariable, it changes dynamically in the production process due to its consumption by plants. Therefore, there is a need to manage the soil fertility of land plots of household plots and dehkan farms in the specific conditions of their use. A specialized classification of soils according to their productivity, built on the objective properties of the soils themselves, is their appraisal. That is, appraisal is a refined agronomic grouping of soils, where the consideration of quality in terms of natural fertility is expressed in points when comparing and refining them according to the average long-term yield of the main agricultural crops. This indicator in the irrigated soils of the Surkhandarya region averaged 68 points in 1991, and according to the results of repeated work in 1999, it decreased by 8 points and amounted to 60 points for irrigated lands, these indicators are mainly determined in general for agricultural land, since the soil bonite score was not determined for the land plots of dehkan and household plots Since today, the quality of soils of land plots of dehkan and household plots (household plots) in taxation and evaluation for their qualitative indicator is taken as a relatively nearby area of agricultural land of the above indicators, in fact, soil quality is much better in dehkan and household plots than in other territories and their bonitet score is somewhat higher. However? in the process of agricultural production, soil fertility decreases with regular use, if not observed, below the scientifically sound rules and related requirements.

2) Soil fertility is restored on the basis of a rational farming system, the introduction of soil protection technologies, and the preservation of humus. Land, when properly used, restores its productive properties. Reproduction of soil fertility in modern agriculture is carried out in two ways. The first involves the use of mineral fertilizers, ameliorants, pesticides, etc., the second - crop rotation, intermediate

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crops, various methods of tillage and sowing methods, etc., these ways are aimed at achieving a single goal, although their mechanism of action is different .

The first mode of reproduction has the strongest impact on land productivity in dehkan farms. This impact is not able to compensate for the loss of soil fertility; its effect is based on the mobilization of the material resources of the soil and is short-term. As a result, this leads to a decrease in permanent sources of soil fertility, although it provides short-term success in increasing crop yields.

The natural basis for the reproduction of soil fertility as a manifestation of the universal law of conservation of matter and energy is ensured by the effective use of organic fertilizers, specialized crop rotations, modern resource-saving technologies for tillage, water reclamation, plant protection products).[3]. The highest effective soil fertility is characterized by soils that, along with a sufficient amount of moisture, have good aeration. And also, with proper use of soils, their fertility not only does not decrease, but also constantly increases.

The structure of the Surkhandarya district includes the southern subzone of the desert, the gray earth belt, the belt of brown (mainly slightly alkaline) soils of medium-altitude mountains and the high-mountain belt of light brown meadow-steppe soils. Gray soils occupy a special place in the system of soil zones. They are distributed in the form of a relatively narrow winding strip along the piedmont and sloping plains and go quite high on the slopes of the foothills and low mountains.

According to bioclimatic conditions, gray soils are located within two soil-climatic provinces: Central Kazakhstan and Central Asian, or Turan. In accordance with this, they are subdivided into northern sierozems, or Kazakhstani, and southern sierozems, or Turan. Those and others, entering the system of vertical zones, depending on the altitudinal position and the associated changes in climate and vegetation, are divided into subtypes: northern light and typical gray soils and southern light, typical and dark gray soils.

Gray soils of all subtypes, modified by prolonged exposure to irrigation, are distinguished under the name of irrigated gray soils. Light gray soils are poor in humus - up to 2.17% in the sod , a sharp decrease is observed downwards. The total reserves of humus in light gray soils range from 50 to 60 t/ha. Their poverty in humus is explained by the high biological activity of soils. The upper layer of light gray soils contains 0.1-0.8% nitrogen. The content of the most mobile hydrolysable nitrogen in gray soils reaches 70% of the total. The content of phosphorus in gray soils varies in a fairly wide range - from 0.1 to 0.24%. Conducted experiments in the Surkhandarya agrochemical laboratory in 1991 to 2001. Show that with permanent sowing of the same plants, the humus content decreased to almost 1%. The alfalfa

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crops widely used in the districts of the Surkhandarya region and on the lands of dehkan farms contribute to a significant enrichment of soils with humus and improve their structure to provide animal feed. In addition, the introduction of manure on the lands of dehkan and household plots contributes to the enrichment of soils with humus. An effective method for increasing the fertility of poorly structured irrigated gray soils is the artificial structuring of their introduction of polymers - semi-acrylamide. In small doses (15-30 kg per 0.1 ha.), these preparations significantly improve the structure (by 15-20% of the previous level), contribute to the creation of a loose, well-permeable and breathable arable layer, reduce water loss through evaporation and eliminate crust formation. .

Plant yields with artificial soil structuring increase by 15–20%, and the growth and development of plants is accelerated. The introduction of organic fertilizers increases the biological activity of soils, in particular, the transition of weakly mobile phosphorus compounds into mobile, plant-accessible forms. In addition, alfalfa crops, improving soil structure, contribute to more economical use of water by plants and reduce its useless loss from the soil for evaporation. On structured soils rich in humus, the efficiency of fertilizers increases. This allows you to get a high yield increase on the lands of dehkan farms for every kilogram of expensive mineral fertilizers.

To obtain high yields of crops on old irrigated soils, it is necessary to apply, in addition to nitrogen and phosphorus fertilizers, potassium, which is confirmed by the available experimental data indicating the effectiveness of potassium fertilizers.

Enrichment of soils with organic matter by introducing manure improves the structure of soils, which favorably affects their water-air regime, sharply enhances the activity of microbes.

Soil cultivation has a great influence on soil improvement. With deep tillage, the soil improves along the entire profile, that is, the density (bulk density) decreases and the porosity increases.

Accounting for the quality of agricultural land is based on the production-genetic classification of land. Land quality records should be based on materials from large-scale soil, reclamation, geobotanical, and agrochemical land surveys.

The detail and accuracy of soil survey materials depend on the method of surveying the boundaries of soil differences and the scale of the soil plan. For soil surveys, previously drawn up plans are used. The accuracy of drawing the boundaries of soil differences largely depends on the completeness and accuracy of the planning basis on which these boundaries are drawn. The more accurate and detailed the geodetic base used for soil survey, the more accurate its materials.

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Therefore, the basis of the survey should be based on plans that quite fully and accurately characterize the land use of dehkan farms.

The accuracy of soil survey materials depends on the number of main and verification sections per unit of the surveyed area. The number of soil profiles is established taking into account the scale of the soil survey and the specific conditions of land use. The number of soil cuts per unit of the surveyed area in the same terrain conditions depends on the scale of the plan. For example, under conditions of the fourth category of complexity, for every 1000 ha of the surveyed area, approximately 67 soil sections should be laid when surveying at a scale of 1: 10,000, or one soil section per 15 ha, and at a scale of 1: 2000 per 1 ha. there is one soil section .

Under more complex conditions, the number of soil cuts increases, while less complex ones decrease.

At present, topographic maps of 1:10,000 scale are also mainly used to conduct a qualitative assessment of agricultural land, rural settlements and lands of dehkan farms. And soil samples for determining the qualitative assessment of land in some cases will not even fall into the territories of individual fields of farms due to the fact that, according to existing standards, the laying of soil pits is provided for in this way. At the same time, he does not even have to talk about the lands of settlements and the territories of dehkan farms, he says. Since on the territory of the category of lands of settlements in the republic, work on the qualitative assessment of lands has not yet been carried out. When necessary (for example, when calculating the land tax rate), the calculations took into account the parameters of a qualitative assessment of land in nearby territories. Naturally, these indicators do not reflect the actual qualitative state of the lands, since the lands of dehkan farms, since they are inherited for life, more attention is paid to them, more funds are invested and more organic and mineral fertilizers are applied. Therefore, it is necessary to improve the methods of accounting and qualitative assessment of land. In order to carry out a qualitative accounting of the lands of settlements and lands of dehkan farms, it is necessary to develop new methodological manuals that would reflect the reliable state of lands in quantitative and qualitative terms.

"Accounting for land quality in the land cadastre system provides for the classification of not only soils, but also lands. In the natural sciences, soil is usually understood as the upper, loose layer of the earth's land, formed under the influence of various factors of soil formation.

The concept of land refers to certain areas of the territory, with a characteristic not only specific soil cover, but also all other conditions on which the method of using the land depends.

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Based on the above, it is proposed to change the procedure for conducting a qualitative accounting of land. First of all, it is necessary to establish that in order to carry out work on the quantitative and qualitative accounting of the lands of rural settlements, the lands of household plots and dehkan farms (personal subsidiary farms of the population), the planning and cartographic basis of a scale of 1: 1000 or 1 : 2000. Taking into account the growth of the population, the creation of new families and new dehkan farms, there are constant changes in the composition of the land fund of settlements, so it is necessary to carry out work on the quantitative and qualitative accounting of land regularly, every 3-5 years. This will make it possible to more accurately assess the quality of soils, to correctly assess the economic activity of dehkan farms, which, in turn, will make it possible to reasonably establish reliable land tax rates.

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Innovative ways of watering household lan...

Innovative ways of watering household lands in the Surkhandarya region of the Republic of Uzbekistan

A Ashurov, G Saydaliyeva and I Khasanov
"TIIAME" National research university, 39 Kori Niyoziy, Tashkent, Uzbekistan

Correspondence: guzal.saydaliyeva@tiiame.uz

Abstract. Under the conditions of water deficit in the republic, one of the most important tasks of household land use is the all-round reduction of water consumption, which is 726.0 thousand hectares in the whole country, and 63.1 thousand hectares in the Surkhandarya region.

The annual water consumption on household lands is about 4.18 million m3, that is, 2.8% of the water consumption in general from the agriculture of the republic and 0.24% of the region 2.4. Innovative methods for irrigation of household lands

Under the conditions of water deficit in the republic of Uzbekistan, one of the most important tasks of household land use is the all-round reduction of water consumption, which is 726.0 thousand hectares in the whole country, and 63.1 thousand hectares in the Surkhandarya region. The annual water consumption on household lands is about 4.18 million m3, that is, 2.8% of the water consumption in general from the agriculture of the republic and 0.24% of the region. [1] In the 2000s, furrow irrigation was perceived as the most progressive, therefore, during this period in the Republic of Uzbekistan, most studies were carried out with the aim of its further improvement. According to numerous reliable sources, it is known that irrigation water losses are up to 30% as a result of the imperfection of the surface irrigation method.

Key words: household lands, irrigation, agriculture, irrigated lands.

1. Introduction

At the same time, several innovative methods for irrigating crops have now been developed, allowing It is natural to reduce the existing irrigation norms, including: drip, sprinkling, subsoil, water spraying. 1981-82 in the Republic, a number of projects were implemented to introduce drip irrigation technologies in experimental plots [3]. According to the group of economists of SIC ICWC [4] The introduction of drip irrigation makes it possible to reduce the rate of water consumption: for vegetables by 55%, for corn - by 50%, for orchards - by 45%; [2] (1 N. Sh. Muminov. Substantiation of forecast indicators of socio-economic development of the Ferghana Valley. Report on the CAW project a, 2014. In this regard, in order to ensure the rational and efficient use of water resources, we considered the possibilities for irrigating household plots of land using the listed innovative methods, their advantages and disadvantages. Drip irrigation is the moistening of the root layer of the soil by continuous drip water supply with a special dropper. A drip irrigation installation or system includes the following elements: a water meter consumed by private household plots, a water sump, a water tank (tank), an electric pump for water intake and filling the tank, a filter, a faucet, main, distribution and irrigation pipelines, droppers (fig. 1)

Figure 1 Drip irrigation installation scheme

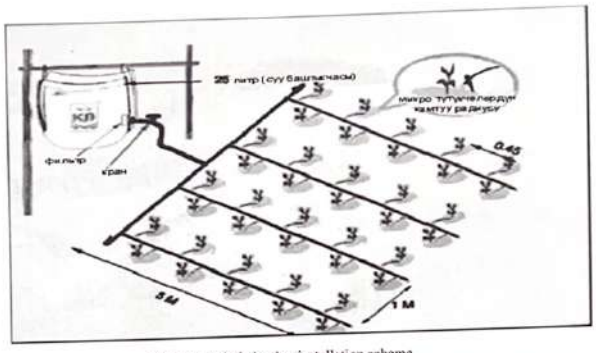

Figure 1 Drip irrigation installation scheme

According to the FAO [7], drip irrigation reduces water consumption in the irrigation of crops up to 12 times compared to surface furrow irrigation [1]. The drip irrigation system can be applied to apricot, apple, peach, cherry, vineyard, tomato, pepper, cucumber, strawberry, watermelon, melon and other highly profitable crops, as well as vegetable greenhouses. Sprinkler irrigation is a method of irrigating agricultural crops, which provides water supply under pressure and its spraying with special sprinkler nozzles. The sprinkler installation includes the following elements: a water meter consumed by private household plots, a water sump. electric pump for water intake and creation of water pressure, sprinkler nozzle, structures for sprinkler installations. This method of irrigation makes it possible to reduce water consumption during irrigation of agricultural crops by 2-3 times compared to surface irrigation through furrows [2]. The general scheme of the sprinkler installation is shown in (Figure 2)

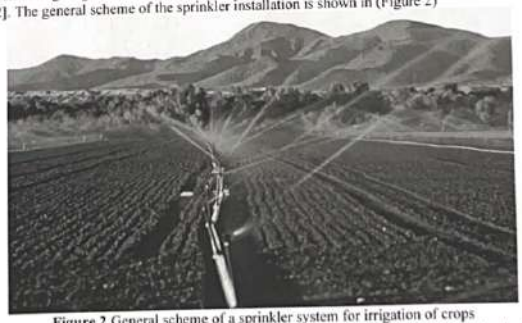

Figure 2 General scheme of a sprinkler system for irrigation of crops

The method of subsoil irrigation involves the supply of water through pipes laid at a depth of 40-45 cm to tubular humidifiers or molehills directly in the arable (subarable) soil layer, moistening it under the action of mainly capillary forces. The subsoil irrigation system includes the following elements: a

water meter consumed by household plots,...

water meter consumed by household plots, a water sump. electric pump for water intake and creation of water pressure, distribution, irrigation and humidification pipelines, switching wells with inspection and drainage aeration pipelines. This method of irrigation allows to reduce water consumption during irrigation of agricultural crops by 4-10 times in comparison with the surface method of furrow irrigation [1]. The general scheme of the subsoil irrigation system is shown (Figure 3)

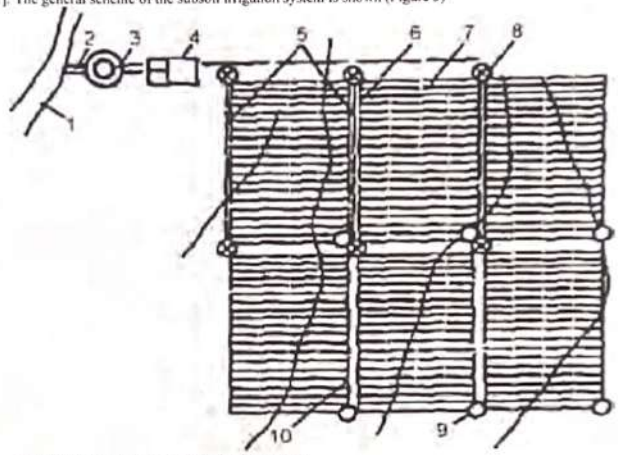

Figure 3 Scheme of the subsoil irrigation system:

1 - source of irrigation; 2 - main pipeline; 3 - electric pump; 4 - treatment facilities; 5, 6, 7 - distribution, irrigation and humidification pipelines; 8.9 - switching and inspection wells; 10 - drainage aeration pipeline.

All innovative watering methods:

- provide a significant reduction in irrigation water (several times) for irrigating the land of a personal plot compared to the existing surface method,
- are mechanized;
- allow you to adjust the irrigation rate and uniform moistening of the irrigated area;
- include installation, instrumentation, water intake from the irrigation network of rural settlements;
- in market conditions, when introducing payments for water as a resource, they significantly reduce their size;
- prevent salinization and waterlogging of lands, as well as soil erosion.

At the same time, it should be noted that certain costs are typical for innovative irrigation methods: firstly, certain investments are required for the purchase and installation of appropriate engineering equipment; secondly, the efficient functioning of engineering installations for irrigation requires operating costs, including repair work, payments for electricity; performing special services for the maintenance of installations.

From the point of view of the main criterion for the transition to innovative irrigation methods - the all-round reduction in water consumption and the careful use of water resources - these irrigation methods are undoubtedly more efficient than the existing surface method.

When analyzing and evaluating the calcula...

When analyzing and evaluating the calculated efficiency of irrigation, it is recommended to use the efficiency indicators of various irrigation methods under optimal conditions for their use, which are based on data from many studies by SPA "SANIIRI" [7]

2. Materials and methods

Advantages and disadvantages of drip irrigation. • significant water savings - since only the root zone of plants is moistened, evaporation losses are significantly reduced, there are no losses from peripheral water flow. • Significant savings in energy, labor costs, fuels and lubricants (POL) and other materials - usually water from canals to the field for irrigation is supplied by pumps.

• Saving of mineral fertilizers by 30-40% - with normal irrigation, 128 kg of nitrogen fertilizer, 23 kg of phosphorus, 15 kg of potassium chloride are consumed per 0.15 hectare of a personal plot. With drip irrigation, 37.5 kg of nitrogen, 22.5 kg of phosphorus, 7.5 kg of potassium are consumed per 1 hectare. At the same time, the absorption of mineral fertilizers is 90-95%, and with traditional irrigation, only 30-35%.

• higher yields and product quality - with drip irrigation, an earlier ripening of the crop is observed. Due to the exact ingress of moisture to the root system of plants and the greater efficiency of fertilizer absorption, a 30-70% increase in yield is guaranteed compared to traditional irrigation. • no secondary salinization - drip irrigation does not require the construction of drainage , underground waters and salts do not rise, the soil structure is preserved.

• Possibility of irrigating heavily crossed areas of the earth's surface with different soil water permeability - drip irrigation system - a system of tubes or tapes, located at the base of plants, ie. on the beds themselves.

• convenience of operations in the aisle - with traditional irrigation, the aisle is filled with water, which makes the movement of equipment and people difficult. • fewer weeds - compared to other irrigation methods. It also follows that from the considered three innovative methods of irrigation of agricultural crops, each of them can be applied to household plots with slightly different efficiency. Thus, the subsoil irrigation system is comparatively more complex and expensive than drip irrigation and sprinkling systems.

This is primarily due to the laying of pipes under the soil, the implementation of plowing the site, as well as the difficulty of replacing these pipes during the operation of the system. This irrigation system is more complex to create and operate, more expensive.

The sprinkler irrigation system, firstly, requires the creation of metal structures for sprinkler nozzles, it is more difficult to operate than a drip irrigation system and requires large investments, as well as insufficient effective soil moisture due to moisture retention by plant leaves.

The listed shortcomings in systems of subsoil irrigation and sprinkling irrigation do not take place in the drip irrigation system.

With conventional furrow irrigation, the net irrigation rate for irrigating 1 hectare of garden area is on average 600 m pcs.) will require 20 m3 of water, which is 30 times less than with furrow irrigation.

3. Results and Discussion

In this regard, for irrigation of household plots in rural settlements, we recommend the method of drip irrigation of agricultural crops and perennial plantations. It is the simplest and most convenient in practical terms, is associated with relatively small one-time capital costs (investments) and provides maximum savings in irrigation water, since it provides its supply directly to the root system, as well as the supply of fertilizers dissolved in it.

Economic Benefits of Drip Irrigation

On average, the cost of installing a drip irrigation system around the world ranges from $1,200 to $3,000 per hectare. Installation of domestic production for wheat will cost land users 91.6 million sums. for 10 hectares, for technical and vegetable crops a little cheaper - 88.4 million sums. The most economical is the drip irrigation system for the garden - 50.4 million sums. This will save a total of

26,890,709 sums, 21,450,729 sums and 30...

26,890,709 sums, 21,450,729 sums and 30,104,813 sums. respectively compared to conventional irrigation.

Thus, taking into account the advantages of SCO:

- 4–10 times water saving compared to furrow irrigation;
- 1.5–2 times increase in crop yield compared to furrow irrigation;
- acceleration of crop maturation;
- washout of the fertile soil layer, salinization and waterlogging of the soil is not allowed;
- large areas can be irrigated with a small water flow;
- land planning is not required, which requires high costs;
- Possibility of fertilizing together with irrigation water.

in order to reduce the irrational consumption of irrigation water in household land use, we consider it necessary to introduce drip irrigation on household plots.

An approximate scheme for placing a drip installation on a personal plot of land is shown in fig. 4

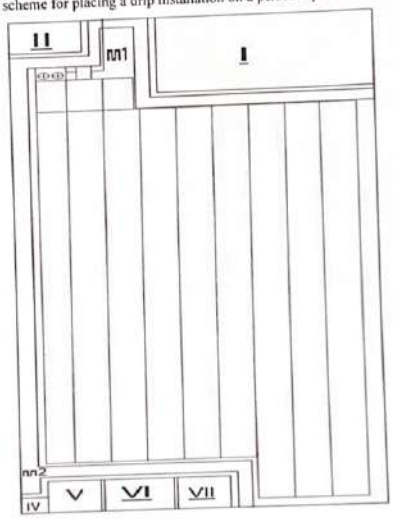

Figure 4. Drip installation placement
I) R zhz \u003d 86.18 sq.m. VII) Pom. for Rpt=46.75
II) R kitchen = 12 sq.m. R household. settlement = 0.04
III) P water supply = 2.25 sq.m. Pl 1 = 16 sq.m.
IV) R toual = 2.25 sq.m. Pl 2 = 2.25 sq.m.
V) Pom. mrs Rmrs=9m sq R pl=18.25m sq
VI) Pom.mrs Rmrs=12m kV

In the course of the dissertation work, I, th...

In the course of the dissertation work, I, the author participated in the introduction of drip irrigation on household plots in the Sherabad region. In April 2021, from the representatives of the United Nations in the form of humanitarian assistance, to the most needy five owners of household plots of the rural settlement "Saroi" of the "Bogobod" mahalla council of the "Tallashkon" massif of the Sherabad district. These owners are seven Abduraimov Panzhi, Khamidov Kholtura, Kholiyorova Normumin and Toshpulatov Gulboya. The total area of these household plots is the same for 0.15 ha and about 0.10 ha for vegetable gardens, with the installation of equipment for drip irrigation by the sponsors of the UN and seedlings of spur varieties of apple trees Starkrimson and Golden Delicious were brought simultaneously with the installation of equipment for drip irrigation and planted a garden. In October 2019, I once again visited Sherabad district and monitored the drip irrigation system in the above-mentioned household plots and made sure that drip irrigation is functioning well.

Drip systems refer to irrigation under pressure.

The role of the dropper is to supply water from an irrigation pipe (diameter 16 to 25 mm and wall thickness 0.25 mm to 1.2 mm) into the atmosphere in the form of droplets without energy.

The design of the flow labyrinth with its small dimensions is the heart of the dripper and this labyrinth corresponds to controlled pressure reduction. The labyrinth is characterized by three parameters: shape, transverse dimensions and length. These parameters determine the flow rate of the dropper depending on the pressure, allowing you to build the appropriate characteristics.

Water in drip pipelines, which is under a certain pressure, passing through the labyrinth of the dropper, enters the pressure compensation chamber. Under normal operating conditions, when the water pressure in the drip pipeline is higher than the pressure at which the compensation process begins, the pressure in the chamber itself will be lower than the working pressure of the pipeline. A flexible membrane mounted in a dropper and located between two pressure levels will begin to bend towards the outlet of the compensation chamber, as a result of which the size of the outlet will also change, which in turn is inversely related to the pressure in the irrigation (drip)) pipeline.

With an increase in pressure in the irrigation pipeline, the size of the outlet decreases; thus, the flow rate of the dropper is kept constant, regardless of pressure changes over a wide range of pressures.

Drip irrigation technology demonstrates their incomparable advantage, compared to alternative methods in terms of a number of objective indicators, the use of drip irrigation systems is not only desirable, but also expedient in terms of gaining the necessary experience.

4. Conclusions

How to install a drip irrigation system. A plastic vessel (a tank with a volume of one ton is installed on a stand 1.0-1.20 m high, a main plastic hose with a diameter of 4 cm is connected to it through couplings; plastic fastening couplings, plastic-owl valves, clamps, filter. To the main hose through couplings connecting a distribution plastic hose with a diameter of 32 cm, plastic hoses with a diameter of 16 cm are connected to it. water, after filling it is given, the water is settled, after half a day the vessel is filled with clear water using an electric pump and the valve is opened.

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