ISSN NO: 2771-8840
Date of Publication: 26-09-2022

Effect of Drip Irrigation of Sunflower Crop on Soil Meliorative Status

Qodirov Z.Z, Oripov I.O', Avezov Sh

Annotation: Many decisions and decrees are being adopted in the Republic on the purposeful use of water resources. On September 6, 2019, the strategy for the development of agriculture in Uzbekistan in 2020-2030 was developed. According to the concept of water management development of the Republic of Uzbekistan for 2020-2030, the areas where water-saving technologies have been introduced are 2 million. ha, including drip irrigation technology for 600,000 ha. applied to the area, 35-40% (3.5-4 billion cubic meters) of water is saved per year. This is 298,000 ha at the expense of water. disused areas can be redeveloped.

Key words: water, crop, irrigation methods, Aral Sea, resource, NS LIVIANTAN

It is known that many factors interact in obtaining a high and stable yield from agricultural crops. Including the irrigation procedure and methods and technologies of irrigation. By the 21st century, the rapid development of various industries and the growth of the population are causing an increase in the need for water. Another factor of the shortage of water resources on a global scale is the uneven distribution of water resources around the world. The lack of water resources in our region may not be noticeable compared to the countries of the African continent, but this does not mean that there are no problems in the field. The water resources of the Aral Sea basin correspond to the basins of two main rivers - the Amudarya and Syrdarya rivers. The total average annual water flow of the Amudarya and Syrdarya basins is 114.4 km3, including 78.3 km3/year in the Amudarya basin and -36.1 km3/year in the Syrdarya basin. The internal (river) water resources of the Republic of Uzbekistan are 11.47 km3, including 4.82 km3/year in the Amudarya basin and -6.65 km3/year in the Syrdarya basin.

Irrigated agriculture is one of the main sectors of the economy of Uzbekistan, and it is the sector that uses the most water.

Currently, 88-92% of the total water used in the country is used for irrigation of crops in the irrigated agricultural areas of Uzbekistan. In this case, water is used to satisfy the physiological needs of crops, i.e. to replace the water used by plants for evotranspiration (evaporation).

Up to 12% of the annual water flow in the canal is wasted due to imbalances (incorrect organization) in the operation of irrigation canals. 17-18% of the water flow is wasted due to the leakage of water from the bottom and sides of the canals. Part of the water conveyed to the canals is wasted at the end of the canals.

Many decisions and decrees are being adopted in the Republic on the purposeful use of water resources. On September 6, 2019, the strategy for the development of agriculture in Uzbekistan in 2020-2030 was developed. According to the concept of water management development of the Republic of Uzbekistan for 2020-2030, the areas where water-saving technologies have been introduced are 2 million. ha, including drip irrigation technology for 600,000 ha. applied to the area, 35-40% (3.5-4 billion cubic meters) of water is saved per year. This is 298,000 ha at the expense of water. disused areas can be redeveloped.

Today, there are 6 methods of irrigation, and each of these methods has its own advantages and disadvantages. Drip irrigation is the most common method of overground irrigation in the world.

Many leading scientists of the world and the Republic have conducted scientific research on the introduction of irrigation methods, and these studies are still ongoing. In addition, experiments on resource-saving technologies are being carried out at the Bukhara Institute of Natural Resources Management of "TIQXMMI" MTU.

Experiments on the development of scientific and practical bases of resource-saving technologies for irrigation of agricultural crops in the conditions of meadow-alluvial soils, sunflower variety "NS LIVIANTAN" in relation to the CHDNS of the soil 75-75-65%, 75-80-70% in order, field experiments on drip irrigation, drip irrigation under the film and drip irrigation in medium mechanical composition soils of

ISSN NO: 2771-8840
Date of Publication: 26-09-2022

"Zarif ota" farm located in Bogi Kalon MFY, Bukhara Region, Bukhara District 2020 - In 2022, field research was conducted. Field experiments were carried out in the following system in order to determine the effectiveness of scientifically based water-saving irrigation technologies of the above-mentioned sunflower variety "NS LIVIANTAN".

Table 1

1.1. Experimental System (For Sunflower Crop)

№	Options	The studied crop type and variety	Pre-irrigation soil moisture % against LFWC	The relative layer of the soil during irrigation, cm
1.	Pre-irrigation (control)	NS LEVIATAN (type)	Actual measurements	50-70-50
2.	Drip irrigation		75-75-65	
			75-80-65	
3.	Drip irrigation from under the film		75-75-65	
			75-80-65	

The experimental system was implemented in 5 options with 4 returns. The dimensions of the plots are as follows: the length of the egate is 100 m, the distance between the egates is 0.6 m, the number of rows is 8, of which 4 are calculation rows, the rest are protective rows, then the area of one option is 1920 m^2, general experience the area was 1920*5=9600 m^2.

The following activities were carried out in the experimental field planted with sunflowers:

- The morphological structure of the soil was studied before the experiment. For this, a section of the soil was dug up to the level of the seepage waters, and the morphology of the soil was determined according to the genetic layers.
- mechanical composition of the soil according to genetic layers 1 m. was determined by the method of N.A. Kachinsky in the samples taken from the soil till the depth.
- the volumetric mass of the soil is determined by taking undisturbed samples. Each year, at the beginning and end of the growing season, in 4 repetitions, each 10 cm soil layer of the experimental options was studied at a depth of up to 1 meter.
- The water permeability of the soil for 6 hours was studied every year at the beginning and at the end of the experiment for all options.
- the limited field capacity of the soil was studied at the beginning of the experiment by placing a frame on the CHDNS 2x2 meter area.
- soil moisture was systematically determined by drying in a thermostat before watering. Soil samples were taken from every 10 cm layers of the 1.0 meter layer in 4 replicates in each variant and analyzed.
- in determining the duration and norms of irrigation, according to the experimental scheme, the CHDNS of the soil and the difference in moisture before irrigation were calculated according to the formula of S.N.Rzhov.
- the amount of water supplied to the experimental field was measured using Chipoletti (VCH-50) water meters.
- The change of the seepage water level was determined using 4 observation wells installed in the experimental area. Pipes have a diameter of 40 mm and are installed at a depth of 2.2 meters. The lower 1.2-meter part of the pipes consists of bubble holes, which are surrounded by a filter (kapron material). The level of seepage water was measured once every 10 days.
- to determine the level of mineralization of sizot waters. The amounts of (dry residue, chlorine ion and sulfate) were determined in all monitoring wells before salt washing and after complete salt washing and at the end of the growing season.

ISSN NO: 2771-8840
Date of Publication: 26-09-2022

➢ Determination of soil salt regime. At the beginning of the study, at the beginning and at the end of the growing season of agricultural crops, soil samples were taken for each variety and variant, and the amount of dry residue, chlorine ion and sulfate was determined (0–30; 30–50; 50–70 and 70–100 cm.).

➢ before the experiment, the amount of humus in the 0-30, 30-50 cm layers of the soil was determined by the method of I.V. Tyurin, the total amounts of nitrogen and phosphorus by the method of L.P. Grisenko, I.M. Malseva, nitrate nitrogen by the calorimeter method, mobile phosphorus by B.P. Machigin, and exchangeable potassium by the method of P.V. Protasov was determined.

 All agrochemical analyzes were carried out based on "Metodika agrokhimicheskikh analizov pochv i rastenyi".

Phenological observations in the experimental field:

- seed germination and seedling thickness are determined according to each option and return,
- height, leaf, yield elements of sunflower on the 1st day of every month (June, July, August, September) on 100 plants (25 in each repetition);
- weight of 1000 pieces of sunflower seeds according to continuously monitored plants (100 plants);
- in the experiment, the harvest was collected from 4 rows of each plot, weighed, crushed, cleaned, and then determined per hectare;
- the quality indicators of sunflower grain are determined according to all options and returns.

Irrigation, feeding and other agrotechnical measures were carried out on the experimental site based on the accepted methods of the Scientific-Research Institute of Cotton Selection, Seeding and Cultivation Agrotechnologies "Field Experiment Methods" (PSUYAITI 2007).

The improvement conditions of the soil of the experimental field are the main criterion for the growth and high yield of sunflower, corn, soybean and beet crops. Therefore, in the cultivation of agricultural crops, the methods of selective sowing and placement of crops according to soil amelioration and fertility are an important factor. Our experimental field is located in the Bukhara district of the Bukhara region, and the hydromodule is included in the M-II-A-v-V region. When agrochemical indicators of the soil of the experimental field were studied, the following was known.

Mineralization of the soil of the experimental field

Table 2

cut	Depth, cm	Alkalinity		Cl		SO_4		Dry residual	Aggregate of salts	CL SO_4
		Total HCO_3 %.да	Total HCO_3 м.э.да	%	milligrams equiv	%	milligrams Equivalence			
1	0-20	0,034	0,56	0,018	0,49	0,048	1,00	0,148	0,124	0,49
	20-40	0,039	0,64	0,011	0,30	0,048	1,00	0,128	0,113	0,30
	40-60	0,040	0,66	0,018	0,49	0,048	1,00	0,142	0,127	0,49
	60-80	0,035	0,58	0,014	0,39	0,048	1,00	0,140	0,118	0,39
	80-100	0,043	0,70	0,018	0,49	0,057	1,19	0,172	0,142	0,42
2	0-30	0,039	0,64	0,014	0,39	0,054	1,12	0,144	0,129	0,35
3	0-30	0,043	0,70	0,021	0,59	0,048	1,00	0,148	0,135	0,59
4	0-30	0,034	0,56	0,018	0,49	0,060	1,25	0,162	0,142	0,39
5	0-30	0,038	0,62	0,016	0,44	0,051	1,06	0,144	0,127	0,42

3-Table

Cut	**Depth, cm**	**Hummus %**	**hummus (humus) Guaranteed**
1	0-20	1,0373	Ўрта
	20-40	0,9471	Ўрта
2	0-30	0,9020	Ўрта

ISSN NO: 2771-8840
Date of Publication: 26-09-2022

3	0-30	0,8569	Ўрта
4	0-30	0,6314	Кам
5	0-30	0,7216	Кам

The study of the agrophysical properties of the soils of the researched field showed that the volume mass of the soil in the plowed layer is around 1.34 g/cm3, and a partial decrease in the volume mass was evident in the subsequent layers. It varied in the range of up to 3 percent. According to the geomorphological, agrochemical, and agrophysical properties of the soil, field experiments are suitable for the cultivation of sunflower, soybean, corn, beetroot and other heat-loving crops for this region. According to the degree of salinity, the soil of the experimental field belongs to the group of weakly saline soils.

Changes in the level of groundwater were determined through 20 permanent monitoring wells.

Salt leaching in winter, rainfall during spring and seasonal irrigation have shown that groundwater varies throughout the year, ranging from 2.0-2.3 m in spring, 1.3-1.6 m in summer, and 2.1-2.4 m in autumn. As a result of seasonal irrigation, the water level rose, and in autumn, after the irrigation was stopped, it decreased again.

In the field where the experiment was carried out, samples of seepage water were taken, and the level of mineralization was studied in the laboratory of the reclamation expedition under the Amu-Bukhara ITHB.

References

1. Isaev S., Khasanov S, Ashirov Y., Gafurov A. and Karabaeva T.-Effects of water saving technology application on growth, development, and yield of cotton in Uzbekistan-E3S Web of Conferences **244**, 02047 (2021), https://doi.org/10.1051/e3sconf/202124402047.
2. Isaev S., Khasanov S, Ashirov Y., Gafurov A. and Karabaeva T.- Effect of water and resource saving technologies of cotton growing on cotton yield-E3S Web of Conferences **244**, 02012 (2021), https://doi.org/10.1051/e3sconf/202124402047.
3. Isaev S., Qodirov Z., Saylikhanova M. and Fozilov Sh-Influence of elements of irrigation technology of medium and late varieties of soybean on soybean yield-IOP Conf. Series: Earth and Environmental Science **937** (2021) 022129, https://doi. doi:10.1088/1755-1315/937/2/022129.
4. Isaev S., Safarova H., Najmiddinov M. and Jumabaev F**.**- Grain yield of repetitive mung bean variety Marjon, after autumn wheat - IOP Conf. Series: Earth and Environmental Science 937 (2021) 022132, https:// doi:10.1088/1755-1315/937/2/022132.
5. Isaev, S., Rajabov, T., Goziev, G., Khojasov, A. Effect of fertilizer application on the 'Bukhara-102' variety of cotton yield in salt-affected cotton fields of Uzbekistan-E3S Web of Conferences, 2021, 258, 03015, https://doi.org/10.1051/e3sconf/20212258 03015.
6. Shamsiev A., Isaev S., Goziev G., Khusanov S., Khusanbaeva N.- Efficiency of the irrigation norm for winter wheat and soy varieties in the typical land of Uzbekistan-IOP Conference Series: Earth and Environmental Science, 2022, 1068(1), 012025, https:// doi:10.1088/1755-1315/1068/1/012025
7. Isaev S., Mambetnazarov A., Khalmuratova B., Goziev G., Ashirov Y.- Efficiency of appropriate irrigation system of cotton and winter wheat in water scarce conditions of Uzbekistan-IOP Conference Series: Earth and Environmental Science, 2022, 1068(1), 012044, https:// doi:10.1088/1755-1315/1068/1/012044.
8. Isayev S. X., Qodirov Z. Z., Oripov I. O., & Bobirova M. B. (2022). EFFECTS OF RESOURCE-EFFICIENT IRRIGATION TECHNOLOGIES IN IRRIGATION OF SUNFLOWERS ON LAND HYDROGEOLOGICAL CONDITIONS. British Journal of Global Ecology and Sustainable Development, 4, 95–100. Retrieved from https://journalzone.org/index.php/bjgesd/article/view/55
9. Egamberdiyev, M. S., Oripov, I. U., Hakimov, S., Akmalov, M. G., Gadoyev, A. U., & Asadov, H. B. (2022). Hydrolysis during hydration of anhydrous calcium sulfosilicate. Eurasian Journal of Engineering and Technology, 4, 76-81.
10. Egamberdiev, M. S., Oripov, I. U., & Sh, T. S. (2022). Development of a Method for Measuring the Layered Moisture State of Concrete and Various Bases. Eurasian Journal of Engineering and Technology, 4, 82-84.

ISSN NO: 2771-8840
Date of Publication: 26-09-2022

11. Qodirov, Z. Z., Oripov, I. A., Tagiyev, A., Shomurodova, G., & Bobirova, M. (2022). WATER-SAVING IRRIGATION TECHNOLOGIES IN SOYBEAN IRRIGATION, EFFECT OF SOYBEAN ON GROWTH AND DEVELOPMENT. European Journal of Interdisciplinary Research and Development, 3, 79-84.