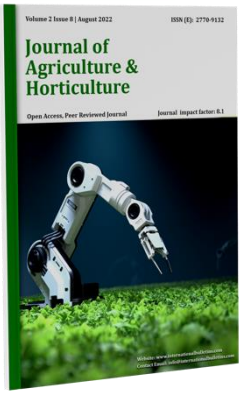

IN THE CONDITIONS OF STRONGLY SALINATED SOILS EFFICIENCY OF DRIP IRRIGATION METHOD

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Abstract: The amount of water used for salt washing in the experimental area for salt washing of soils when using drip irrigation method on saline soil, obtained according to the change in the depth of seepage water when salt is washed by drip irrigation method observational data are presented.

Key words: Drip irrigation, watermelon, melon, crop, salt washing, irrigation rate, soil porosity, soil moisture.

Enter. Special attention is being paid to the effective use of irrigated land in order to ensure food security in the world.

Extensive irrigation and land reclamation measures are being implemented in our republic today to improve the land reclamation, restore, maintain and regularly increase soil fertility, and create additional water sources. As a result of these measures, today drip irrigation methods are used on the area of 43 thousand ha, on the area of 34.0 thousand ha using a film on the edge and on the area of 45.6 thousand ha using portable flexible pipes. In the action strategy on the five priority directions of the development of the Republic of Uzbekistan, further improvement of the reclamation condition of irrigated lands, development of the network of reclamation and irrigation facilities, intensive methods in the field of agricultural production, first of all, water and special attention is paid to the introduction of modern agrotechnologies that save resources.

Research materials and method. The researches were carried out based on generally accepted methods: measurements and analyzes in the researches were adopted in PSUEAITI "Methods of studying agrophysical, agrochemical and microbiological properties of soil in cotton fields", "Methods of conducting field experiments", "Methods of agrochemical and agrophysical research in irrigated cotton areas, field and vegetation experiments with cotton" methodological manuals were used.

Analysis and results. In the second version of the experiment, drip irrigation pipes were placed at intervals of 3 m, 60 m long, after 4 m from the first option area placed in the experimental area to wash saline soil by drip irrigation method (pipe d- 16 mm, droplet spacing 30 cm). In the second variant of the experiment, the amount of water used for salt washing was based on the water standard determined for the first salt washing in the first variant of the experiment (according to the formula of I.F. Muzichik).

For the first time, the theoretical salt leaching rate was 1181 m^3/ha. In drip irrigation, it is necessary to divide the rate of this saline wash, because in the drip irrigation method, firstly, it is not possible to give water in large amounts, and secondly, to prevent the level of seepage waters from rising. and salty washable 1 m. it is possible to completely clean the layer

from salts. For this, it is required to divide the total salt washing rate into tacts even in drip salt washing.

The tacts of distributing the rate of drip irrigation are determined as follows.

$$\eta = \frac{5 \cdot 24}{10} = \frac{120}{10} = 12 \text{ marta}$$

he water consumption in each tact is T=m/n = 1181/12 = 98.4 m3/ha

The experimental area is designed for the cultivation of polys crops, so the row spacing is 3 rows of 3 m, the length of the row is 60 m (60*3=180m), when there are 3 drippers per meter (180:0.3= 600 pieces) there are 600 droppers, their water consumption is 5 l/hour; average one-time water consumption is 98.4 m3 or 100 m3 (100,000 l).

The duration of salt washing is determined as follows.

Water was supplied from t = 100000/(600·5) = 100000/3000 = 33 hours (or 11 hours per row).

Table 1.

Water consumption in salt washing with drip irrigation

Number of brine washes	Duration and duration of saline washing	Standard m3/ha	The number of beats	One-time standard l.	Duration of saline washing, number	Salt washed days day/month
1	1-25.XI	1200	12	100000	33	11-12
2	2-26.XII	1200	12	100000	33	11-12
3	1-25.01	1200	12	100000	33	11-12
4	1-25.02	1200	12	100000	33	11-12
total	115	4800	48	400000	132	

The data obtained on the total water consumption and the number of strokes are presented in Table 1. According to the data of this table, the duration of salt washing is 115 days (November, December, February, March), the amount of water used during this period is 4800 m3/ha., the number of salt washing is 48 times, every duration of water supply was 33 hours.

The methods of salt washing with drip irrigation mentioned above have shown their effect on soil moisture levels. Scientific data on changes in soil moisture during salt washing are presented in Table 1. These obtained data show that the soil moisture before saline leaching (end of October) soil moisture is on average 1 m. in the layer was 14.2%, the limited field moisture capacity of the soil (CHDNS) was 63.7%. During the first month (November) in the experimental area, 1 m of soil was watered at the rate of 1200 m3/ha. 21.7%, compared to CHDNS, 97.3% moisture was formed in the layer. When analyzing the distribution of moisture according to the depth of the soil, 0-30 cm of the soil. is the highest (22.7-23.5%), i.e. 101.8% compared to CHDNS, 30-50 cm. 22.0-22.5% in the layer, 98.7-100.9% compared to CHDNS, the lower 70-100 cm of the soil. layer was 19.5-20.5%, and compared to CHDNS it was 84.4-91.9%.

During the month of January, salt washing continued in the experimental area. Also this month, the total salt washing rate is 1200 m3/ha, and this water is distributed every 11-12 days in 100 m3. At the beginning of January, soil moisture before salt washing is 1 m. 20.8% in

the layer, 93.3% compared to CHDNS. This indicator is 0.9% less than at the beginning of December, mainly due to the absorption of moisture from the surface of the earth into deep layers.

Table 2

Soil moisture % before washing in option 2 with drip saline washing

Repeat №	Soil layer sm	October 30	December 2	January 1	February 1	March 1
I	0-30	9,7	23,3	19,0	23,5	24,0
	30-50	12,3	22,5	20,0	23,0	23,5
	50-70	15,7	20,4	22,1	22,4	23,0
	70-100	18,9	19,5	21,0	20,5	22,6
	o‘rtacha	14,5	21,4	20,5	22,4	23,3
II	0-30	8,5	22,7	20,3	23,3	23,5
	30-50	13,0	22,5	22,1	23,5	23,0
	50-70	15,5	21,4	22,0	23,0	23,3
	70-100	18,5	20,2	20,5	22,5	23,5
	o‘rtacha	13,9	21,7	21,2	23,1	23,3
III	0-30	7,7	23,5	19,0	23,5	23,0
	30-50	13,5	22,0	20,0	23,3	22,7
	50-70	16,2	21,7	22,2	23,2	23,0
	70-100	19,2	20,5	21,3	23,5	22,5
	o‘rtacha	14,2	21,9	20,6	23,4	22,2
	in an average layer of 1 m	14,2	21,7	20,8	23,0	23,0
	% of soil relative to CHDNS	63,7	97,3	93,3	103,1	103,1

When soil moisture was determined in early February before the next saline wash, the average moisture content in all soil layers was 23.0%, and compared to CHDNS, it was 103.1%. . shows that the layer is completely saturated with water.

The data obtained on the distribution of moisture on the sides of the soil, i.e., on the right and left sides of the dripper pipes, during drip salt washing, are presented in Fig. 1. As this figure shows, the soil moisture along the right and left sides of the drip irrigation pipe is 50 cm on each side during the first salt wash. it was observed that it was fully wetted in the width. In this case, 1 m of soil. -50 in the depth of the layer and in the pipe; 50 cm. 21.6% moisture content in width, 100 cm. 15.4% at a distance and 13.3% at a distance of 150 cm. In the next saline wash, the width of soil wetting reached 100-120 cm wide from the humidifier

pipe, and after the 4th saline wash, it was 50 cm. soil moisture is 23.9% in width up to 100 cm. 21.2% at a distance and 18.0% at a distance of 150 cm.

In general, in the 2nd variant of the experiment, 4800 m3/ha of water was used for salt washing using the drip irrigation method during the months of November-February. m3/ha. The given water level is 0-30 cm of the soil. 22.7-23.5% in the layer of CHDNS compared to 101.8%, 30.-50 cm. 22.0-22.5% in the layer compared to 98.7-100.9% CHDNS, 1 m. 19.5-20.5%, 84.4-91.9% humidity compared to CHDNS was formed in the layer.

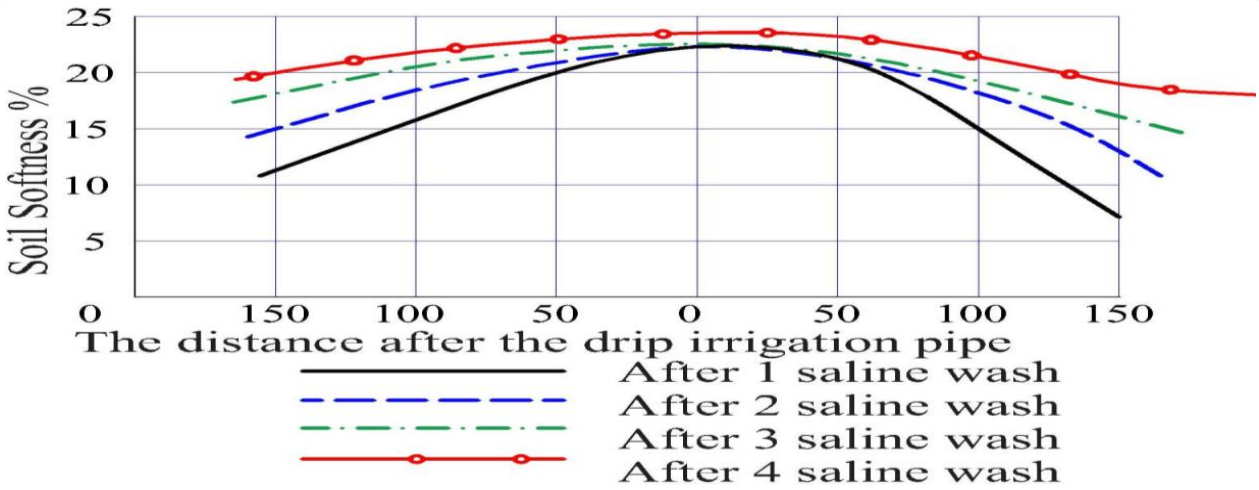

Figure 1. Wetting of the soil on the sides during drip salt washing.

Also, soil moisture during drip irrigation is 50 cm from the drip irrigation pipe. the highest humidity (23.9% compared to CHDNS and 107%) was observed in the distance. This pointer is 100 cm. at a distance of 21.2% (95.0% compared to CHDNS), at a distance of 150 cm it was 18.0% (80.7% compared to CHDNS). As a result of salt washing, the depth of seepage water is 143-148 cm (before salt washing) and 102-111 cm. (after salt washes) increased to.

Soil salts of brine leaching standards
effect on washing.

The effectiveness of salt washing in saline lands is based on the soil conditions of the place, the depth of the seepage waters and the amount of salts in them, the level of drainage of the land (type of drains, depth, distance between them, the flow modulus of the drainage water), the technology of preparing the land for salt washing (ploughing, deep softening, leveling , the sizes of the checks, the relationship between the arrows and the checks) and depends on the duration of salt washing, the norms of watering.

The soil of the experimental area is light gray, salty and highly saline, medium in terms of mechanical structure (in 1 m layer), there are open ditches, seepage water is located close to the surface of the earth (120-142 cm during salt washing), 30 cm initially when preparing the land for salt washing . plowed in depth and 10x20 m checks were taken, saline leaching was carried out from November to the end of February 2020, with a total leaching rate of 2232 m3/ha in the 1st option of the experiment. , in the 2nd variant of the experiment (salt washing by drip irrigation) - 4800 m3/ha of water was consumed.

The above salt leaching rates had different effects on the leaching of salts from the soil. The results of the scientific research on leaching of salts from the soil are presented in Figures 3.8.1-3.8.2. According to the data of this table and the picture, in the 1st variant of the

experiment, 1 m of the soil as a result of salt washing. the amount of dry residue in the layer decreased from 2.314% to 1.322%, i.e. by 57%, the reduction of salts mainly corresponded to the amount of chlorine ion (from 0.639% to 0.087%) and sodium (from 0.671% to 0.201%), relatively reduced leachate, calcium (from 0.278% to 0.222%) cation and sulfate (0.517% to 0.403%) anion were recorded.

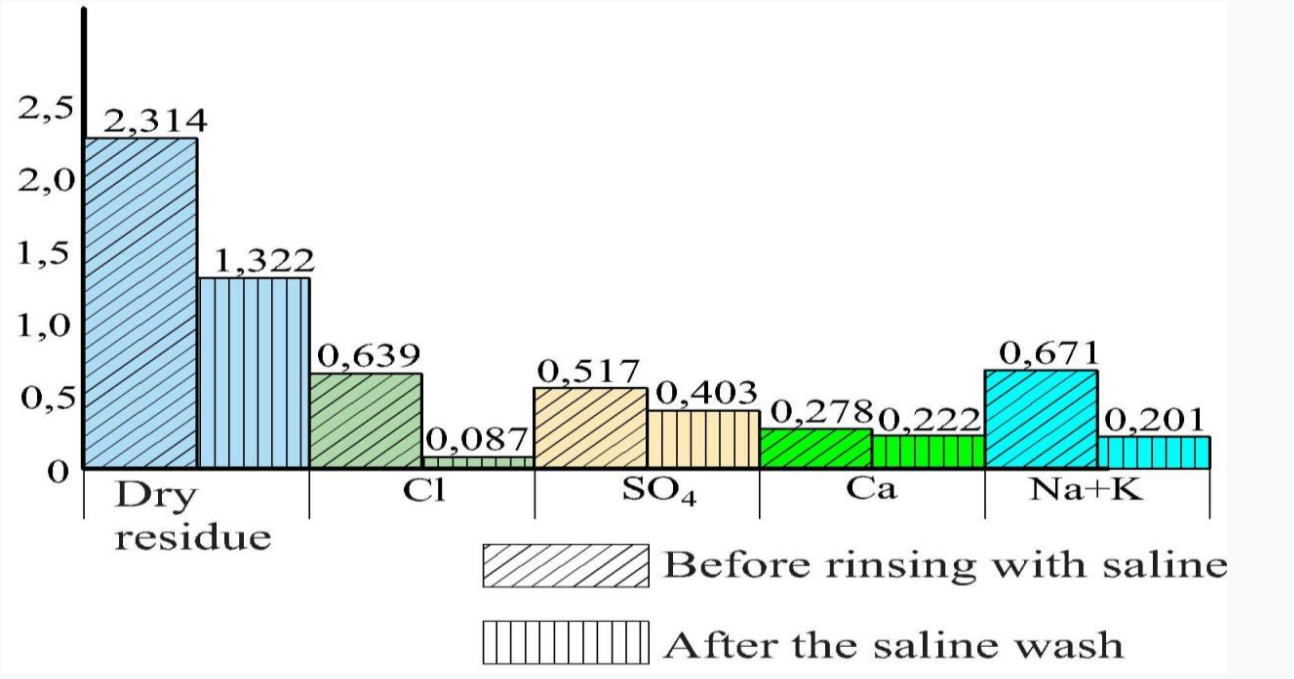

Figure 3.8.1. Washing of salts in the soil in the 1st option of the experiment.

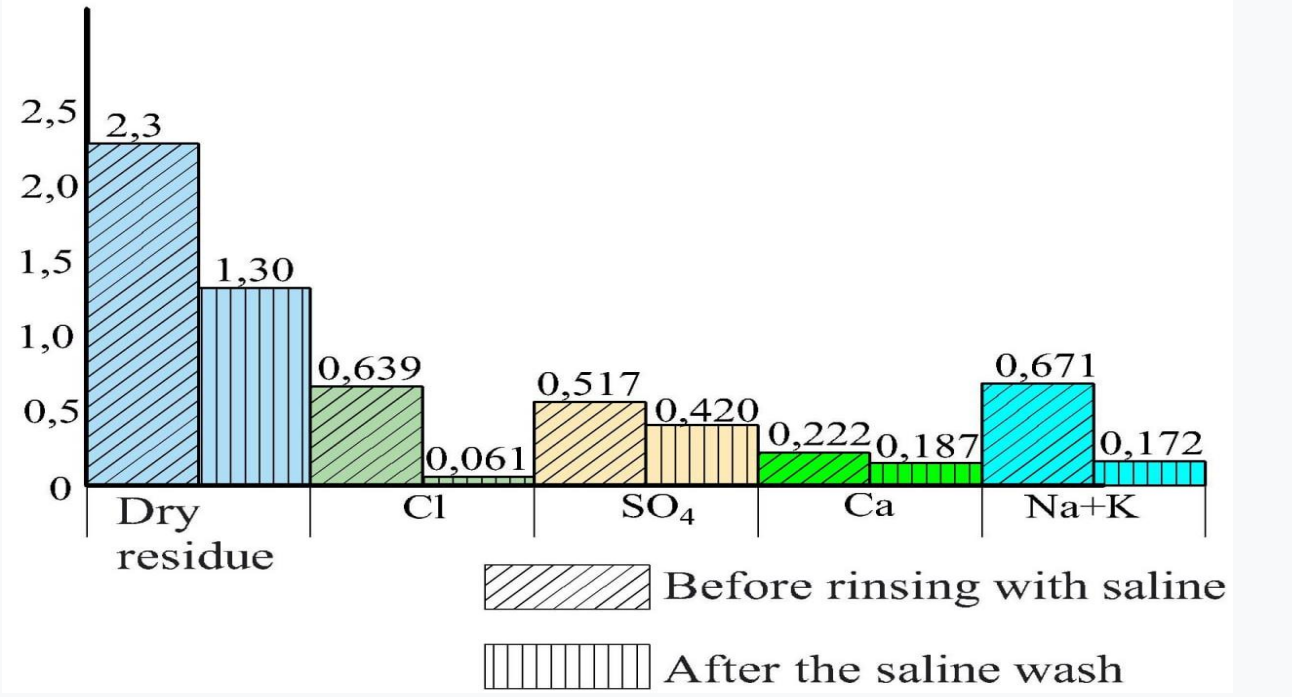

Figure 3.8.2. In the 2nd variant of the experiment, leaching of salts in the soil.

In the experimental area, it was observed that there were changes in the ES-indicator of salts under the effect of salt washing. In this case, the ES-index of the soil before salt washing is 1 m on average in the 1st variant of the experiment. 3,228-3,970 ds/cm in layer. is, and it belongs to the category of saline soil according to the accepted classification. In this variant,

after salt washing of the soil, the ES indicator decreased from the saline level to the average salinity level (2.12-2.26 ds/cm) at points 1 and 2, and at point 3, i.e., the amount of salts in the soil was 3,670-4,350 ds/cm before salt washing. presence, decreased to the level of 2.30-2.55 ds/cm (strong salinity) after saline washing.

In the 2nd variant of the experiment, i.e. when the saline is washed by the method of drip irrigation, as in the 1st variant of the experiment, the amount of dry residue in the soil is from 2.30 to 1.30%, the amount of chlorine ions is from 0.639% to 0.061%, the amount of sodium is from 0.671% to 0.172% , SO4-from 0.517% to 0.420%, and calcium decreased from 0.222% to 0.187%.

During saline leaching by drip irrigation, leaching of salts in the soil is mainly within 100 cm of the drip irrigation pipe. (50+50 cm) was observed in the field, where the ES index of the salts was on average 1 m. in the depth was 0.73-0.80 ds/cm., 100 cm from the drip irrigation pipe. at a distance this indicator is 1.41-1.51 ds/cm at 150 m. and at a distance, the salts were almost not washed away (2.65-3.35 ds/cm).

The main reason for this is that the water supplied through the drip irrigation system was distributed to a distance close to the dripper pipes (100 cm) and ensured the washing of salts of the same width and depth (100x100 cm), after which it was observed that the water filtered in a more vertical direction before reaching further distances.

In the experimental area, the water rates given for saline leaching resulted in the leaching of salts from the soil depending on the leaching methods (through check and drip irrigation method).

2232 m3/ha of water used for saline leaching in the 1st option of the experiment (through checks) reduced the salt content of the soil from saline level to moderate and strong salinity level. In the 2nd variant of the experiment (drip salt leaching), when the total salt leach rate is 4800 m3/ha, the amount of salts in the soil is 100 cm (50+50 cm) wide and 100 cm deep around the drip irrigation pipes. salts at a distance of 200 cm (100 + 100 cm) decreased to a moderate salinity level, and salts at a distance of 150 cm (150 + 150 cm) remained at the level of salinity without washing.

Conclusions

1. The rate of salt washing according to the tacts of distribution of the rate of dropwise salt washing was equal to 1181 m3/.

2. Soil moisture was 14.2% on average in one meter layer, limited field moisture capacity of soil (CHDNS) was 63.7%.

During the first month (November) in the experimental area, as a result of water supply at the rate of 1200 m3/ha, 21.7% moisture was created in one meter layer of the soil, 97.3% relative to CHDNS.

When analyzing the distribution of moisture by the depth of the soil, 0-30 cm of the soil. is the highest (22.7-23.5%), i.e. 101.8% compared to CHDNS, 30-50 cm. 22.0-22.5% in the layer, 98.7-100.9% compared to CHDNS, the lower 70-100 cm of the soil. layer was 19.5-20.5%, and compared to CHDNS it was 84.4-91.9%.

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