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WASHING THE SOIL THROUGH IRRIGATION EROSION AND MEASURES TO COMBAT IT

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ANNOTATION

The paper indicates materials related to water savings with the help of water weir, which installed in furrow in order to protect from irrigation erosion, decreasing erosion of soil and positive effect on cotton yield.

KEY WORDS: ***washing, soil, erosion, combat.***

It is known that soil erosion causes serious damage to the national economy, especially agriculture.

Soil erosion is common in our republic due to irrigation, wind, floods, landslides, mountain erosion (due to strong rains or rapid melting of snow).

Erosion processes occur either under the influence of natural changes, or due to anthropogenic influences.

At present, erosion processes occurring in the course of natural changes are to some extent predicted and managed. But the erosion that occurs in terms of anthropogenic effects requires study, research.

In this article, one of the erosion processes that occur in the anthropogenic effect is the result of the experiments conducted on soil washing, which occurs in roughing and irrigation. In the current period, there are many cases of washing the top, fertile part of the soil, pouring estimated water on each roughness met.

As a result of this kind of erosion, an average of 100-150 thousand tons of soil is washed out of every hectare of land during the vegitation period, and along with this, a huge amount of humus, nitrogen, phosphorus, potassium, other macro-micro elements, crop diseases, agrochemicals used against weeds are also washed and the environment is polluted.

From this kind of erosion, less than half a million, tons, some other authors write that one million tons of cotton are harvested in the Republic every year. Therefore, the fight against this disaster is one of the main tasks.

On the Republican scale, the occurrence of various erosion processes and their area are listed in Table 1. [3]:

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1-Table.
Information about Areas Exposed to Erosion

Type of erosion	Thousand / ha
Total area of the Republic	44884[x]
Damaged by all kinds of erosion	30870
Water erosion:	7067
Mountaineering	5645
Arable land	1422
Irrigation erosion	722
On lalmikor lands (from strong rain or melting of snow)	700
Wind erosion	21873
In the Sahara Sagittarius zone	20031
Irrigated lands	1812
Water and wind erosion at once	1929

X) it is required to identify the data.

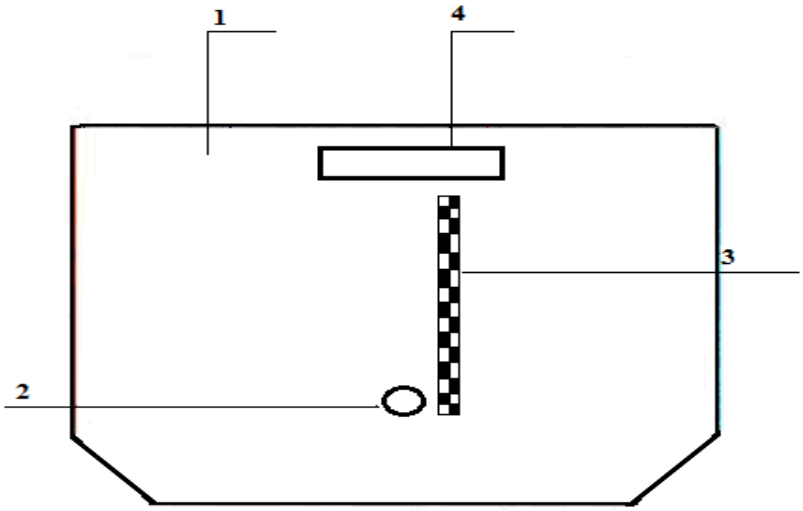
These data indicate that our republic suffers from erosion processes and requires to fight them, to maintain and increase the fertility of lands exposed to erosion.

A number of scientific research works were carried out by our scientists on the origin of irrigation erosion, its negative impact on the agrochemical, agrophysical States of the soil and the fight against it [1;2]. But these problems have not yet found a full-fledged solution, and measures of wide use are absent in production.

One of the most basic in the fight against erosion of this variety is the proper distribution of water into the owner. To solve this problem, scientific research works were carried out together with the scientific research institute of agrotechnologies of cotton selection, seed growing and Cultivation, Department of soil erosion protection and agroecology, Tashkent Institute of irrigation and melioration, Department of soil erosion protection and agroecology. As a result of the research, each owner was tested 2,5 and 4,50 slope in the field of experiment of the scientific research institute "agrotechnologies of cotton selection, seed production and cultivation", in the field of development of water meters and their field conditions, and in the Chinoz district "Kulakhmad ota" in the conditions of typical burlap in the farmer's farm.

The scheme of the water meter – devices produced is shown in Figure 1 below.

Water meter fixture



1 – figure.
1 - plastic wall; 2 - water transfer part; 3-rubber; 4-handle.

The mode of operation of this device is based on the following.

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When determining the flow of water from the device, we must first look at the types of "holes". If the following condition is met, the holes in the objects are considered small.

$$\omega_1 \geq 4\,\omega;$$

where ω_1 – is the surface of the water satchel;
ω-hole surface.

If the following condition is met, the walls are obtained as

$$t < 0{,}5\ d$$

Here it is. t-wall thickness;
d-hole diameter.

To determine the water consumption flowing out of a small object, we use the equations of gravity and, as a result, determine the speed at which it flows through the hole [4,5 and head]:

$$\upsilon_c = \phi\sqrt{2g \cdot H} \quad (1)$$

Here: uc-the speed of the current coming out of the hole.
ϕ -speed coefficient, determined from experience;
g-free fall acceleration;
H-water pressure in front of the hole;

We determine the water consumption through the hole using the following formulas:

$$Q = \mu\omega\sqrt{2gH}; \quad (2)$$

Based on the dynamics of the movement of the current in the rut, we determine the face of the hole:

$$\omega = \frac{Q}{\mu\sqrt{2g \cdot H}} \quad (3)$$

ω = 0,78 d²;

We solve the equations 1 and 2 together and determine the diameter of the hole. The diameter of the hole is determined depending on the flow rate and water consumption. The results of the calculation are presented below (table 2):

2-Table.
Calculation of hole diameter

Water pressure H=2 sm	Q, л/с	0,1	0,2	0,3	0,4	D cp
	d, sm	1,7	2,4	2,9	3,4	2,6
Water pressure H=4 sm	d, sm	1,5	2	2,5	2,9	2,2
Water pressure H=6 sm	d, sm	1,3	1,8	2,2	2,6	2
	dcp	1,5	2,07	2,5	3	2,3

Based on the experiments conducted, irrigation erosion was detected on water meters of different diameters. The results of the experiments are presented (Table 3).

3-table.
Irrigation standards (m³/ha)

option	Water measurement device parameters	Indicators	In the unwashed part of the soil	In the washed sleeve of the soil	In the washed out part of the soil
			Total, m³/ha	Total, m³/ha	Total, m³/ha
1	Simple (on the farm applied)	Irrigation standard (brutto)	6627,0	6886,9	6147,3
		Spent water (netto)	4660,8	4953,0	4324,1
		Running water	1966,1	1933,8	1823,2
		Washed soil, t/ha	36,9	40,3	34,3
2	10мм	Irrigation standard (brutto)	6627,0	6886,9	6147,3
		Spent water (netto)	4660,8	4953,0	4324,1
		Running water	1966,1	1933,8	1823,2
		Washed soil, t/ha	9,0	9,3	8,4
3	15мм	Irrigation standard (brutto)	4730,2	4916,2	4387,0

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		Spent water (netto)	4254,4	4421,8	3945,6
		Running water	475,8	494,4	441,4
		Washed soil, t/ha	15,7	16,3	14,1
4	20мм	Irrigation standard (brutto)	5991,6	6627,1	5556,9
		Spent water (netto)	4526,6	4703,7	4266,8
		Running water	1465,0	1523,4	1290,1
		Washed soil, t/ha	27,7	28,8	24,4

As can be seen from the information obtained, in the erosion-free part of the pike, when watered by the farm method, water was spent on one hectare of land at 6627,0 m^3, the soil was washed to 36,9 t/ha, water consumption in the variant with the diameter of the water meter was 10mm 4661,7 m^3, respectively In the eroded part of the crop feed, the water consumption was 6886,9 m^3 when watered by the farm method, corresponding to the above figures, the soil was washed to 433 t/ha, water consumption in the water meter diameter option was 10mm 4844,9 m^3, respectively, 9,3 t/ha, 15 mm 4916,2 m^3 , 16,3 t/ha, and 20mm 6627,1 m^3,

From this information, it can be concluded that irrigation water is much more economical when the porous is watered with water meters, and in terms of water economy, the best results can be achieved when the diameter of the water meters is 10 mm. But in order for the in this hole to reach the end of the water in the rut with respect to the 15 mm water meter, 4 - 4,5 hours are spent a lot.

In soils that have not undergone erosion, each without fertilizer-on average 16,2, 200 kg of nitrogen per hectare of corn crop, 140 kg of phosphorus and 100 kg of potassium fertilized with 26,3 Centner, or additional yield compared to the fertilizer-free option was 10,1 Centner. Now the goose is without fertilizer, but the yield in the variant where the water meter is appropriate 10 mm is 20,5, in the water meter with 15 mm is 22,1, and in the variant 20,9 mm is 18,9 Centner.

In the soil exposed to erosion, the wheat crop suitable for options is 25,7; 14,5; 21,5; in the accumulation section of 20,0 and 17,4 millet 27,6; 17,9; 21,9 ; 22,6; 23,9; and 24,8 was a Centner.

Thus, when multiplying the crop of the goose, it turned out that the optimal water meter hole diameter is 15 mm, the accuracy of the additional crop was confirmed in mathematical studieslanm (NSR soil type monan 1,09; 1,26 and 1,62 ts/ha).

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