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ҚАЗАҚСТАНДАҒЫ БҰЗЫЛҒАН ЖЕРЛЕРДІ ҚАЛПЫНА КЕЛТІРУДЕГІ ҚҰМДАРДЫ БЕКІТУ ЖӘНЕ АҒАШ-ӨСІМДІК МЕЛИОРАЦИЯЛАУДЫҢ ТӘЖІРИБЕСІ

Мақалада Қазақстандағы бұзылған жерлерді қалпына келтіру кезінде құмдарды бекіту және ағаш-өсімдік мелиорациялауға қажетті шаралар қарастырылған.

Кілт сөздер: мелиорация, құмды жерлер, қалпына келтіру, топырақ.

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WOOD AND PHYTOMELIORATION EXPERIENCE AND FIXING OF SAND AT REKULTIVATION OF THE ERODE LANDS IN KAZAKHSTAN

In the article "Wood and Phytomelioration Experience and Fixing of Sand at a Rekultivation of the Erode Lands in Kazakhstan" the complex of rekultivation works for phytomelioration and fixing of moving sand was considered.

Key words: rekultivation, degradation of lands, fixing of mobile sand, salinization, site.

UDC:626.87:633.18:631.445

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INCREASING THE PRODUCTIVITY OF WATER AND LAND RESOURCES USE ON RICE CROPS OF AKDALA ARRAY OF IRRIGATION

Abstract: The effectiveness of this mode of rice irrigation is defined as the cost of water for irrigation of rice, and on productivity and costs for its cultivation. In this case, the basis for

rice irrigation regime accepted the optimum conditions for the formation of salt, air and soil nutrient regimes, and a layer of water ponded forming the high productivity of rice fields.

Keywords: Irrigation, rice, leach ate, productivity, irrigation standards, rice crop rotation, water - salt balance.

Akdala rice-growing array is located in the middle and downstream of the Ili River and is one of the most promising areas of cultivation of this crop. Today it has invested nearly 31thous.ga, but has the potential to be utilized under the rice crop rotation to 43.4 thous. hectares. However, huge losses of water in the irrigation network and overstated irrigation rates form the unnecessary discharge of water of drainage network, leading to excessive consumption of irrigation water. Therefore, the study and implementation of water-saving irrigation technology of rice, leading to the culture Akdala rice system, the problem is highly relevant and addresses issues of water conservation, improve the social, environmental and economic issues in the region.

We have established the optimal mode of irrigation of rice on Akdala rice system and includes a six stages of regulation of the water layer in paddy fields:

- The first stage - flooding rice paddies layer 8 - 10 cm after planting rice;
- The second stage - the decrease of the water layer to zero due to the termination of the water supply;
- The third stage - the maintenance of the water layer 3 - 5 cm, the activation of germination of rice plants;
- The fourth stage - the increase in the layer of water up to 15 cm, in order to control weeds;
- The fifth stage - the decline of the water layer up to 5 - 6 cm during the tillering of rice plants;
- The sixth stage - to maintain of the water layer 10 - 12 cm during of booting - tasseling, flowering, reaching milk ripeness. During the period of ripeness water supply to the rice paddies stopped, there is a natural decline in the layer of checks and drying before harvesting.

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Filtration of water in rice paddies an irrigation period measured by the vegetation vessels shows that in initial flooding the rice paddies its value reaches a maximum value of 30 mm / day, and then, as the rising ground water is reduced and reaches 14.3 mm / day (Figure 1).

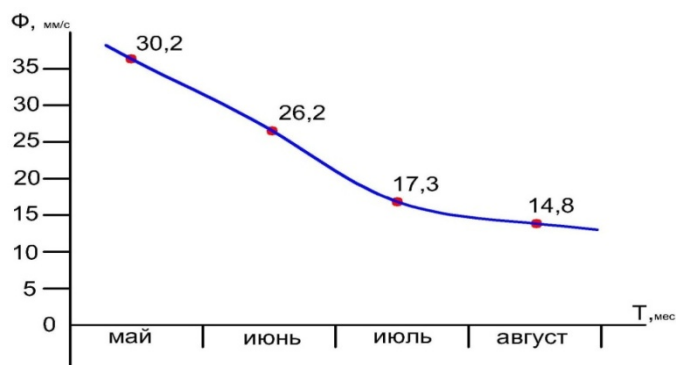


Figure 2 - Schedule of filtration in the rice fields during the irrigation period

On Akdala rice fields rice system with filtration exceeding 10 mm / day up more than 70%, figure 2. When you filter the water from the rice paddies in the amount of 10 mm / day and a renewal of water in paddy fields is due to seepage flow with which the root zone of the rice plants are carried harmful salts and trace elements, and favorable (optimum) conditions for water, air, nutrient and oxygen regimes in all drawing area of rice fields. At these checks with no running water and effluents generated a high prolificness of rice (60 - 70 centner / ha).

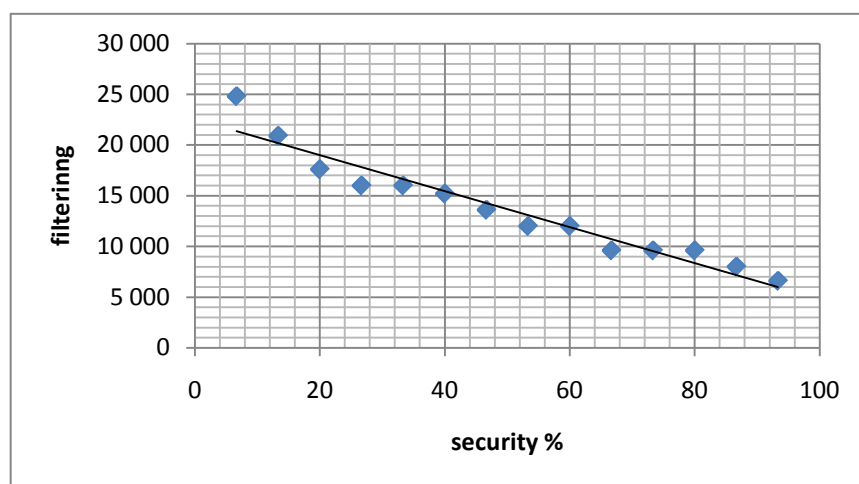


Figure 3 - Empirical curve probability of filtration flow
Probability filtration flow P 10mm/day = 72 %

To determine the productivity rice in the experimental - production area counts the density of rice germination, the number of plants in an area of 1 m² and kustitost. Plant density of rice tillering and productivity the highest on the checks from which the daily filtration flow an irrigation for a period varies between 10 mm / day, Table 1.

Table 1. Filtration, Density of stalks and productivity of rice varieties "Изумруд"

Maps, rice fields		Filtration, mm/day	Bushiness	Number of plants per 1 m ²	Productivity of rice, c / ha
1	1	13,0	1,4	196	57,6
	2	12,0	1,7	217	59,8
	3	9,6	1,2	245	64,1
	4	9,6	1,3	247	65,9
2	5	9,6	1,8	210	64,7
	6	8,0	1,5	221	62,2
	7	5,6	1,3	203	56,5

The volume of water supplied to the rice fields, was measured by weirs Ivanova installed in rice fields to flooding. By volume of water is determined the irrigation norm, which varies from 16,669 m³/ha to 28,542 m³/ha (Table 2).

Table 2. Determination of irrigation norm on the development - the experimental area of rice

№ rice fields	The area of the rice field, ha	A layer of water on the overfall, H, cm	Flow rate of overfall, Q, l/sec	Hydronic module, l/sec ha	Irrigation norm, M, m ³ /ha
1	1,98	2,6	4,05	2,045	17 669
2	1,98	2,7	4,28	2,16	18 676

2	1,98	2,6	4,05	2,04	17 673
2	1,98	2,5	3,82	1,93	16 669
5	2,61	3,3	5,84	2,24	19 332
6	2,66	3,2	5,57	2,09	18 092
7	2,57	4,2	8,49	3,30	28 542
Average	2,25	3,01	5,16	2,26	19 522

The average value of irrigation rate in paddy fields by weirs is 19522 m³/ha for vegetation vessels - 20,794 m³/ha (Table 3).

Expenditures of irrigation water per hundredweight of rice yield is 313 - 332 m³ / c in filtering water from the rice fields for irrigation period - 9600 m³/ha. In this volume filtration rice yield is 64.1 - 65.9 c / ha (Table 3).

Table 3. Components of irrigation rate of rice taken according to vegetation vessels and the cost of irrigation water per hundredweight of rice crop

№ п/п	The volume of saturated soil-ground, settlement, m ³ /ha	Filtering m ³ /ha	Evapotranspiration m ³ /ha	Discharging flow, m ³ /ha	Irrigation norm, m ³ /ha	Productivity of rice, centner / ha	Expenditures of irrigation water, m ³ / centner
1	1 280	13 600	9800	-	24 680	57,6	428,47
2	1 280	12 000	9 800	-	23 080	59,8	385,95
3	1 280	9 600	9 800	-	20 680	64,1	322,62
4	1 280	9 600	9 800	-	20 680	65,9	313,81
5	1 280	9 600	9 800	-	20 680	64,7	319,63
6	1 280	8 000	9 800	-	19 080	62,2	306,2
7	1 280	5 600	9 800	-	16 680	56,5	295,22
Average	1 280	9 714	9 800	-	20 794	61,54	338,84

On the experimental - industrial site Agrofirms "Birlik", where rice was cultivated without faults and flowage, the average irrigation rate was 20,158 m³/ha, including soil-ground saturation - 1280 m³/ha leachate - 9714 m³/ha evotranspiratsiya - 9800 m³/ha. On the industrial crops businesses rice irrigation rate (net) represents 29,273 m³/ha, rice yield 48.0 t / ha, the amount of waste drain discharging flow - 24,930 m³/ha, in which the proportion of percolating water from the rice paddies of 9,714 m³ / ha, the loss of irrigation network - 7836 m³/ha, and the rest is 7380 m³/ha is formed by the non-productive surface water discharges from the rice paddies.

If the loss of water from the irrigation system due to the low efficiency: intereconomic 0.82 and 0.63 onfarm can not be avoided, then the overhead surface discharges can be reduced by 70%, or 5,166 m³/ha. Research has established that the discharge can be reduced by 70% of the irrigated area, filtration of water from rice fields above 9 mm / day. On the surface discharges of these checks should not.

Under the recommended without discharging water saving irrigation technology of rice production of rice under irrigation rate will be reduced to 5166 m³/ha, or 29%, and the yield of rice increased by 15 - 20%.

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ПОВЫШЕНИЕ ПРОДУКТИВНОСТИ ИСПОЛЬЗОВАНИЯ ВОДНЫХ И ЗЕМЕЛЬНЫХ РЕСУРСОВ НА ПОСЕВАХ РИСА АҚДАЛИНСКОГО МАССИВА ОРОШЕНИЯ

Орошение люцерны в рисовом севообороте с поддержанием порога влажности 75% НВ способствует повышению урожайности сена люцерны на 25 – 30%, снижает поднятие солей от грунтовых вод на поверхность почвы. Принятый в Агрофирме «Бирлик» четырехпольный севооборот – два года – рис, затем два года люцерны способствует обогащению почвы органическим веществом, получению хороших урожаев риса и сена люцерны.

Ключевые слова: Орошение, севооборот, люцерны.

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АҚДАЛА СУАРУ МАССИВІНДЕ ЖЕР ЖӘНЕ СУ РЕСУРСТАРЫН ПАЙДАЛАНА ОТЫРЫП, КҮРІШ ӨНІМДІЛІГІН АРТТЫРУ

Күріш ауыспалы егістігіне жоңышқаны суармалауда ылғалдылықты ұстап тұру 75 % жоңышқа дақылы өнімділігін 25-30 % дейін жоғарылатуға жағдай жасайды, топырақ бетіне грунттық сулардан тұздың көтерілуін төмендетеді. «Бірлік» агрофирмасында қабылданған егіс айналым жүйесі топырақты органикалық заттармен байытуға септігін тигізеді, күріш 50 ц/га және одан жоғары жақсы өнімділігін алуға, жоңышқа шөбі суғарусыз – 60 ц/га, кейін суғаруды жүргізу – 80 ц/га және одан жоғары.

Кілт сөздер: грунттық су, төменгі ылғалдылық.