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THE EFFECT OF ORGANIC AND MINERAL SUBSTANCES ON THE PRODUCTIVITY AND QUALITY INDICATORS OF RICE IN LANKARAN

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ВЛИЯНИЕ ОРГАНИЧЕСКИХ И МИНЕРАЛЬНЫХ ВЕЩЕСТВ НА ПРОИЗВОДИТЕЛЬНОСТЬ И КАЧЕСТВЕННЫЕ ПОКАЗАТЕЛИ РИСА В ЛЕНКОРАНИ

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Abstract. The study of different rice varieties, determination of their compatibility with soil and climatic conditions is the most important direction in the development of agricultural science. In 2022, research work was carried out on three rice varieties in the village of Shikhakaran, Lankaran district: Govhar (regional), Sarykiprik (local) and Avangard (improved). Soil samples were collected and analyzed taking into account the introduction of various organic fertilizers, including nitrogen, phosphorus and potassium in five variants and three replicates. Phenological observations were carried out and the qualitative and quantitative indicators of plants were studied. According to the results obtained, it can be noted that rice growth varies from 109.3 to 148.0 cm, plant bushing is 6.7-15.5 cm. The highest bushing was noted against the background of mineral fertilizer in the Govhar variety. The length of the lateral shoots is at least 21.5 cm, maximum 25.2 cm. Accordingly, the number of grains on the lateral shoots is 56.0-109.4 pcs. On the lateral shoots, the highest indicator was observed in the Govhar variety — 2.0-5.2 g. The productivity of the Govhar variety against the background of mineral fertilizers was 25.5 g, and for the Avangard variety — 23.3 g. The thousand seed weight is 23.2-33.1 g, and the Govhar, Sarykiprik, Avangard varieties were distinguished by relatively high indicators against the background of mineral fertilizer. In grains, in terms of protein content, against the background of organic fertilizer, the Govhar variety was 9.03%, against the background without fertilizer, the Sarykiprik variety - 9.3%, against the background of organic and mineral fertilizer, the Avangard variety — 8.87%. No differences in the amount of sugar in seeds were found between the varieties.

Аннотация. Изучение различных сортов риса, определение их совместимости почвенно-климатическим условиям является важнейшим направлением в развитии сельскохозяйственной науки. В 2022 году в селе Шихакаран Ленкоранского района проведены исследовательские работы по трем сортам риса: Говхар (региональный), Сарыкиприк (местный) и Авангард (улучшенный). Отобраны и проанализированы пробы почвы с учетом внесения различных органических удобрений, в том числе азота, фосфора и калия в пяти вариантах и трех повторностях. Проведены фенологические наблюдения и изучены качественные и количественные показатели растений. По полученным результатам можно отметить, что рост риса меняется от 109,3 до 148,0 см, окустение растений — 6,7–15,5 см. Самое высокое окустение было отмечено на фоне минерального удобрения у сорта Говхар. Длина боковых побегов составляет как минимум 21,5 см, максимум 25,2 см. Соответственно на боковых побегах число зерен составляет 56,0–109,4 шт. На боковых

побегах самый высокий показатель наблюдался у сорта Говхар — 2,0–5,2 г. У сорта Говхар производительность на фоне минеральных удобрений составила 25,5 г, у сорта Авангард — 23,3 г. Масса тысячи семян — 23,2–33,1 г, а относительно высокими показателями отличались сорта Говхар, Сарыкиприк, Авангард на фоне минерального удобрения. В зернах по количеству белка на фоне органического удобрения у сорта Говхар составило 9,03%, на фоне без удобрения у сорта Сарыкиприк — 9,3%, на фоне органического и минерального удобрения у сорта Авангард — 8,87%. В семенах по количеству сахара различий между сортами не обнаружено.

Keywords: rice, Lankaran, Govhar variety, Avangard variety, Sarikirpik variety, productivity, proteins, organic fertilizers, inorganic fertilizers.

Ключевые слова: рис, Ленкорань, сорт Говхар, сорт Авангард, сорт Сарыкиприк, производительность, белки, органические удобрения, минеральные удобрения.

Paddy occupies the 2nd place among all plants in terms of cultivated area on the earth. And the world feeds two fifths of the earth's population. The paddy plant needs heat and high humidity. Paddy, the most adaptable cereal crop in terms of climate, is grown in a large place and landscape types [1].

Since ancient times, the paddy has been grown in Azerbaijan. The paddy agriculture is performed in Astara, Central Aran, Mil-Mughan and Shirvan-Salyan economical regions. In terms of evolution, this plant is grown in the Lankaran-Astara zone because these zones belong to subequatorial, humid tropical, subtropical regions. The population of this region evaluates rice in comparison with the wheat that's why the rice has consolidated its place in the region's national kitchen over the centuries. The historical facts proved that the population of this region was actively busy with the paddy-growing. Encouraged by the state support to the agricultural sector, the residents of the district started to engage in this profitable field again. 526 hectares In 2017, 526 hectares of paddy were planted in Lankaran, 195 hectares in Masalli, and 245 hectares in Aran region-Aghdash. The farmers' interest increases in this area mostly. It is more important to begin sowing from April to May taking into account the regions. It is advisable to plant paddy in the Lankaran-Masalli zone starting from the 1st 10 days of May, in the Shaki-Zagatala and Aghdash zone from the 3rd 10 days of April. Generally, sowing can be performed, if the temperature is 12°C [4, 6].

The paddy loves heat. Minimum germination temperature of the seed is 12-16°C. The period from complete germination of paddy to the end of bushing is 30-32 days. Bushing happens depending on seed sort and the timely implementation of agrotechnical rules. 22-25 days are required from bushing end to flowering. Maturity and wax is formed in 18-20 days. Generally, cultivation period of the paddy ends for 115-140 days. Due to the fact that formation time of paddy worms is in the initial period of bushing after sowing, it is advisable to treat them with "Karte".

Material and Methodology

A main aim of the research: "State program for the paddy-growing in the Republic of Azerbaijan for 2018-2025" was adopted by the order approved by the President of the country Mr. Ilham Aliyev on February 9, 2018. The targets of the State Program for 2025 are to increase the total production to 10 000 hectares, the total production to 40 000 tons, and the average yield to 40 s/h. And this makes it necessary to carry out extensive scientific-researches. All these are possible at the expense of main aim of the research is to achieve development of the local and introduced paddy sorts with rational methods, increase of ecologically pure agricultural products manufacture.

Tasks of research: the following tasks have been set for achieving the goal; the research object - investigation of the morphological, agro-physical and agrochemical indicators; application of organic fertilizers according to soil need; study of the irrigated water resources content; analysis of the climate condition during the plant vegetation; realization of the sowing for the region by applying different organic fertilizers - the cow, sheep and bird manure, mineral fertilizer background and variants without fertilizer, carrying out phenological observations, studying qualitative indicators after crop harvest, performing observations.

The soil samples were taken and analyzed in order to study an amount of macro and micro elements, physical and chemical characters before and after sowing. pH size of soil acidity was calculated by measuring of organic carbon (%) with humid oxidization method, total nitrogen (%) — Kjedal method, absorbing phosphorus (mg/kg) with Olsen method, Potassium (mg/kg) amount with ammonium acetate method. Composition of organic fertilizers, chemical characters of water for irrigation use was studied. The sowing material was selected and cleaned. The research was performed on Govhar, Sarikirpik and Avangard sorts. The observations were performed, qualitative and quantitative indicators were studied in the phenological stages after sowing.

Research Object and Conduction Methods

The research was carried out in 3 repetitions and 5 variants in the 686 m². The variants consist of bird, sheep and cow manure and non-fertilizer variant. The research was carried out on 3 paddy sorts — Govhar, Sarikirpik and Avangard. The influence of the control and different fertilizers on agronomic characters, qualitative and quantitative indicators was analyzed.

During the experiments fulfillment, the phenological observations were performed on all the agro-technical measures, field research works and plants about cultivation of the paddy plant. During the research, the structural analyses were performed, the soil samples were taken before sowing and after crop harvest and their agro-physical and agro-chemical characters were analyzed.

Research Progress

The paddy is mainly planted by 2 methods: i.e. with hand and seedling. It has been proven in practice to carry out sowing with seedling techniques in areas with flat terrain and large water-holding patches. During manual sowing, seed loss and breakage isn't allowed because the seeds are evenly distributed in the food plots. That is, the seed is saved. The technique is used in Lankaran. That is, the paddy is planted by the seedling method. At this time the paddy seedling is grown in the special seed-plots (tumchar) [2, 5].

The sprinkle is begun while the temperature is 10-12⁰ C, but in the water it is 14-15⁰ C at the end of April and at the beginning of May. The sprinkle was performed with 20x20 cm scheme by the quadratic nest method, 1 (one) plant (seedling) was planted in every nest when a length of seedling is 15-17 cm (Figure 1, 2).

The paddy plant needs the water. Watering is preferred during seedling planting. The paddy development is in 2 stages: the period from the 1st paddy germination to bushing (Figure 3, 4). At this time the high humidity should be achieved and the sowing should be buried in water, but the 2nd from bushing phase to wax maturity phase the fields must be buried in water. During the wax maturity the water is gradually cut off and moisture of the field can be dried to 70%. If there are weeds, they must be fought. Darican grass (*Echinochloa* spp), Giz grass (*Cyperus difformis*), weeds were observed (Figure 5, 6) and cleaned with mechanical ways. One of the factors affecting growth and development of the plants is temperature. The paddy, that is a grain plant, is very sensitive to both low (at 1⁰ C temperature) and high temperature stress. If the flowers live at 35⁰ C or more temperature more than 1 hour, the paddy seed can't be formed [1, 3].



Figure 1. Paddy seedling



Figure 2. Newly planted paddy bed



Figure 3. Bushing stage of paddy plant



Figure 4. Phenological observations in the experimental area



Figure 5. *Echinochloa* spp.



Figure 6. *Cyperus difformis*

Predictions for the upcoming season help crop management that is characteristic for yield growth and assessment of the pests. The sorts which are diseases and heat resistant and prognostic models should be offered. Rice yield of paddy changes depending on sort, color, form of the seed, the transport period of rice, degree of seed breakage, glassiness, in which part of the grain is the floury part, cracking degree, growing condition, correct use of the agro-technical measures. Rice

yield rises till 3% depending on fertilizer kind, dose and giving period. Application of the fertilizers increase productivity, highly affects the chemical content of paddy. An amount of albumen can be increased to 2% at the expense of nitrogen against the background of phosphorus and potassium that is given under paddy. 35-40 centners are harvested from each hectare of paddy, there is 50-60 centners and more productivity in the areas where highly agro-technical service is performed [4, 6].

We carried out researches in 3 repetitions, 5 variants on paddy plant in the Shikhakaran village of the Lankaran region in 2022 (Table 1).

3 paddy sorts — Govhar (regional), Sarikirpik (local) and Avangard (improved) sorts were studied in different fertilizer variants. So, these sorts were planted in blocks in the cow, bird and sheep manures, mineral fertilizers are applied, as well as in the non-fertilizer options, all phonological phases of the plants were also agro-technical maintenance work, observation and records were carried out. The seedlings were planted on June 4, 2022. The samples were taken from 3 plants on each variant and repetition which were in the blocs and structural analyses were performed on September 3.

The soil samples were taken on available 15 blocs and they were analyzed in the laboratory (Figure 7, 8).

Harvesting has been done since the 1st 10 days of September. The paddy seeds have been cleaned in different apparatus, sorted and packaged, stored up for next year.

Table 1

SCHEME OF THE EXPERIMENTAL AREA

1/1	Govhar	Poultry manure	6/1	Avangard	Chemical fertilizer	11/1	Sarikirpik	Zero manure
1/2	Sarikirpik		6/2	Govhar		11/2	Avangard	
1/3	Avangard		6/3	Sarikirpik		11/3	Govhar	
2/1	Govhar	Bovine manure	7/1	Govhar	Sheep manure	12/1	Sarikirpik	Poultry manure
2/2	Sarikirpik		7/2	Avangard		12/2	Avangard	
2/3	Avangard		7/3	Sarikirpik		12/3	Govhar	
3/1	Govhar	Sheep manure	8/1	Sarikirpik	Zero manure	13/1	Avangard	Bovine manure
3/2	Sarikirpik		8/2	Govhar		13/2	Govhar	
3/3	Avangard		8/3	Avangard		13/3	Sarikirpik	
4/1	Govhar	Chemical fertilizer	9/1	Govhar	Poultry manure	14/1	Avangard	Sheep manure
4/2	Sarikirpik		9/2	Sarikirpik		14/2	Sarikirpik	
4/3	Avangard		9/3	Avangard		14/3	Govhar	
5/1	Govhar	Zero manure	10/1	Sarikirpik	Bovine manure	15/1	Avangard	Chemical fertilizer
5/2	Sarikirpik		10/2	Avangard		15/2	Sarikirpik	
5/3	Avangard		10/3	Govhar		15/3	Govhar	

As it is seen from the 1st table, a length of the paddy samples changes by 109,0-148,0 cm, a length of the most samples is more than 100,0 cm. Bushing of the plants was observed 6,7-15,5 cm depending on separate samples. According to bushing, the highest index was noted in Govhar sort against the mineral fertilizer. A length of the brooms is minimum 21,5, maximum 25,2 cm.

The number of seeds in broom is accordingly 56,0-109,4. This index was observed in Avangard sort against the background of mineral fertilizer, Govhar sort against the background of sheep fertilizer (Table 2, Figure 9).



Figure 7. An area of the scientific-research experiment



Figure 8. Conducting of the structural analyses

Table 2

STRUCTURAL ANALYZES OF THE RICE PLANT, 2022

№	Variant, variety	Background	Plant height, cm	The number of stems in a plant, in numbers	Broom				Productivity of the plant, gr.	Mass of 1000 grains, gr.	Biomass (Biological Yield)
					The length of the broom, cm	The number of grains in the broom, pcs.	The mass of the grain on the broom, gr.	The mass of the seed in the plant			
1	1/1, Govhar	Poultry manure	117,2	11,1	23,9	111,6	2,47	18,34	20,81	26,4	48,3
	9/1, Govhar		121,0	12,2	22,0	81,3	1,9	17,1	19,0	25,2	50,0
	12/3 Govhar		126,8	13,0	22,0	85,0	2,1	20,3	22,4	24,0	62,4
	Medium		121,7	12,1	22,6	92,6	2,2	18,6	20,7	25,2	53,5
2	2/1, Govhar	Bovine manure	126,7	16,5	24,4	109,4	2,4	29,8	32,2	22,8	73,7
	10/3 Govhar		137,4	11,9	24,7	83,4	1,9	19,5	21,4	21,6	57,4
	13/2, Govhar		129,9	15,6	22,5	78,8	1,9	23,2	25,1	25,2	60,6
	Medium		131,3	14,7	23,9	90,5	2,1	24,1	26,2	23,2	63,9
3	3/1, Govhar	Sheep manure	142,3	17,4	25,4	121,9	2,8	31,1	33,9	23,2	93,4
	7/1, Govhar		136,1	11,0	21,9	70,7	1,8	13,5	15,3	24,8	44,8
	14/3 Govhar		127,7	10,8	22,7	84,5	2,1	15,1	17,2	24,4	46,7
	Medium		135,4	13,1	23,3	92,4	2,2	19,9	22,1	24,1	61,6
4	4/1, Govhar	Chemical fertilizer	155,4	21,8	26,3	123,6	2,9	42,1	45,0	27,6	93,5
	6/2, Govhar		141,3	12,0	24,8	95,3	2,4	18,4	20,8	26,8	62,3
	15/2 Govhar		147,2	12,8	24,6	88,1	1,9	16,9	18,8	24,4	84,8
	Medium		148,0	15,5	25,2	102,3	2,4	25,8	28,2	26,3	103,5
5	5/1, Govhar	Zero manure	128,0	11,4	22,1	78,7	2,0	15,0	17,0	22,4	52,0
	8/2, Govhar		116,7	11,5	21,5	87,5	2,0	16,2	18,2	23,6	44,7
	11/3 Govhar		112,0	8,4	21,2	1,9	11,7	15,6	17,6	24,8	38,6
	Medium		118,9	10,4	21,6	56,0	5,2	15,6	17,6	23,6	45,1
6	1/2, Sarikirpik	Poultry manure	123,2	9,5	24,8	114,4	3,5	29,5	33,1	29,2	63,1
	9/2, Sarikirpik		109,6	7,3	21,2	78,7	2,6	14,4	17,1	31,6	34,6
	12/1 Sarikirpik		109,6	8,2	21,8	96,1	3,3	17,2	20,5	34,8	39,5

№	Variant, variety	Background	Plant height, cm	The number of stems in a plant, in numbers	Broom			The mass of the seed in the plant	Productivity of the plant, gr.	Mass of 1000 grains, gr.	Biomass (Biological Yield)	
					The length of the broom, cm	The number of grains in the broom, pcs.	The mass of the grain on the broom, gr.					
			<i>Medium</i>	114,1	8,3	22,6	96,4	3,2	20,4	23,6	31,9	45,8
7	2/2, Sarikirpik	Bovine manure	124,6	12,4	23,0	123,5	3,3	26,8	30,1	26,8	81,1	
	10/1, Sarikirpik		110,0	6,7	21,9	73,1	2,5	11,0	13,5	30,8	34,0	
	13/3 Sarikirpik		110,4	8,4	20,2	84,2	2,7	13,7	16,4	33,2	39,4	
			<i>Medium</i>	115,0	9,2	21,7	93,6	2,8	17,1	20,0	30,3	51,5
8	3/2, Sarikirpik	Sheep manure	120,6	11,1	23,0	97,1	2,8	21,3	24,1	33,2	54,6	
	7/3 Sarikirpik		113,5	10,5	21,3	90,9	3,1	21,2	24,3	34,0	52,3	
	14/2 Sarikirpik		125,6	9,6	22,6	82,3	2,7	19,0	21,7	32,0	48,2	
			<i>Medium</i>	119,9	10,4	22,3	90,1	2,9	20,5	23,4	33,1	51,7
9	4/2, Sarikirpik	Chemical fertilizer	136,2	12,4	24,5	116,1	3,5	28,1	31,6	28,8	74,9	
	6/3 Sarikirpik		120,9	10,7	21,6	93,3	2,9	17,6	20,6	29	52,1	
	15/3 Sarikirpik		126,9	10,9	23,7	99,9	4,1	20,1	24,2	29,2	73,2	
			<i>Medium</i>	128,0	11,3	23,3	103,1	3,5	21,9	25,5	29,0	66,8
10	5/2, Sarikirpik	Zero manure	120,6	9,1	24,4	105,4	3,5	20,7	24,2	37,2	52,2	
	8/1, Sarikirpik		108,4	7,2	21,4	71,4	2,2	11,4	13,6	31,6	33,1	
	11/1 Sarikirpik		119,1	7,9	22,4	100,6	3,3	19,8	23,1	29,6	44,1	
			<i>Medium</i>	116,0	8,1	22,7	92,5	3,0	17,3	20,3	32,8	43,1
11	1/3 Avangard	Poultry manure	115,0	10,4	23,6	120,7	4,0	26,8	30,8	33,6	61,3	
	9/3 Avangard		109,7	6,8	21,8	85,1	3,0	14,4	17,3	32,0	34,3	
	12/2 Avangard		109,6	8,4	22,4	86,6	2,9	18,8	21,8	32,8	42,3	
			<i>Medium</i>	111,4	8,5	22,6	97,5	3,3	20,0	23,3	32,8	46,0
12	2/3 Avangard	Bovine manure	119,2	9,3	22,5	119,7	3,7	23,7	27,5	30,0	56,0	
	10/2 Avangard		113,9	6,8	22,2	90,9	3,1	14,1	17,2	34,0	39,2	
	13/1 Avangard		112,6	8,3	19,9	86,3	2,9	17,6	20,4	32,0	42,4	
			<i>Medium</i>	115,2	8,1	21,5	99,0	3,2	18,5	21,7	32,0	45,9
13	3/3 Avangard	Sheep manure	119,5	11,6	24,0	123,9	4,0	30,8	34,8	31,6	80,3	
	7/2, Avangard		113,2	6,0	20,8	77,8	2,6	10,9	13,5	31,6	31,5	
	14/1 Avangard		129,1	6,9	22,4	98,6	2,9	16,6	19,5	31,6	42,5	
			<i>Medium</i>	120,6	8,2	22,4	100,1	3,2	19,4	22,6	31,6	51,4
14	4/3 Avangard	Chemical fertilizer	119,9	8,5	24,1	107,5	3,4	18,1	21,5	28,4	58,5	
	6/1, Avangard		108,7	10,2	21,9	92,3	3,0	21,6	24,6	31,2	49,6	
	15/1 Avangard		131,4	11,1	24,4	128,4	3,9	30,2	34,0	32,4	68,0	
			<i>Medium</i>	120,0	9,9	23,5	109,4	3,4	23,3	26,7	30,7	58,7
15	5/3 Avangard	Zero manure	117,5	8,5	23,0	116,7	4,4	25,1	29,6	30,8	72,1	
	8/3 Avangard		99,1	5,7	20,4	83,6	2,8	11,7	14,5	32,4	30,5	
	11/2 Avangard		111,2	6,0	21,0	87,7	2,9	13,5	16,4	34,4	30,9	
			<i>Medium</i>	109,3	6,7	21,5	96,0	3,4	16,8	20,1	32,5	44,4

The highest index of the seed mass on sorts and background is 2,0-5,2 grams was observed in Govhar sort. The plant productivity in Govhar (25,5 g) and Avangard (23,3) sorts was noted against the mineral background. One of the important elements of productivity is considered the plant

productivity and mass of 1000 seeds. These indicators accordingly change by 17,6-28,22 g and 23,2-33,1, Govhar, Sarikipik and Avangard sorts differed on mineral fertilizer background.

While evaluating quality of the paddy, its rice yielding, the increase in the volume of the cooked rice, disintegration and chemical composition of the cooked rice is taken as a basis. An amount of albumen in the seed was superior — Govhar was 9,03% on the background of sheep, Sarikipik was 9,3% on the background of non-fertilizer fertilizer, Avangard sort was 8,87% on the background of cow and mineral fertilizers. The important differences weren't according to the quantity of sucrose (Table 3, Figure 9).

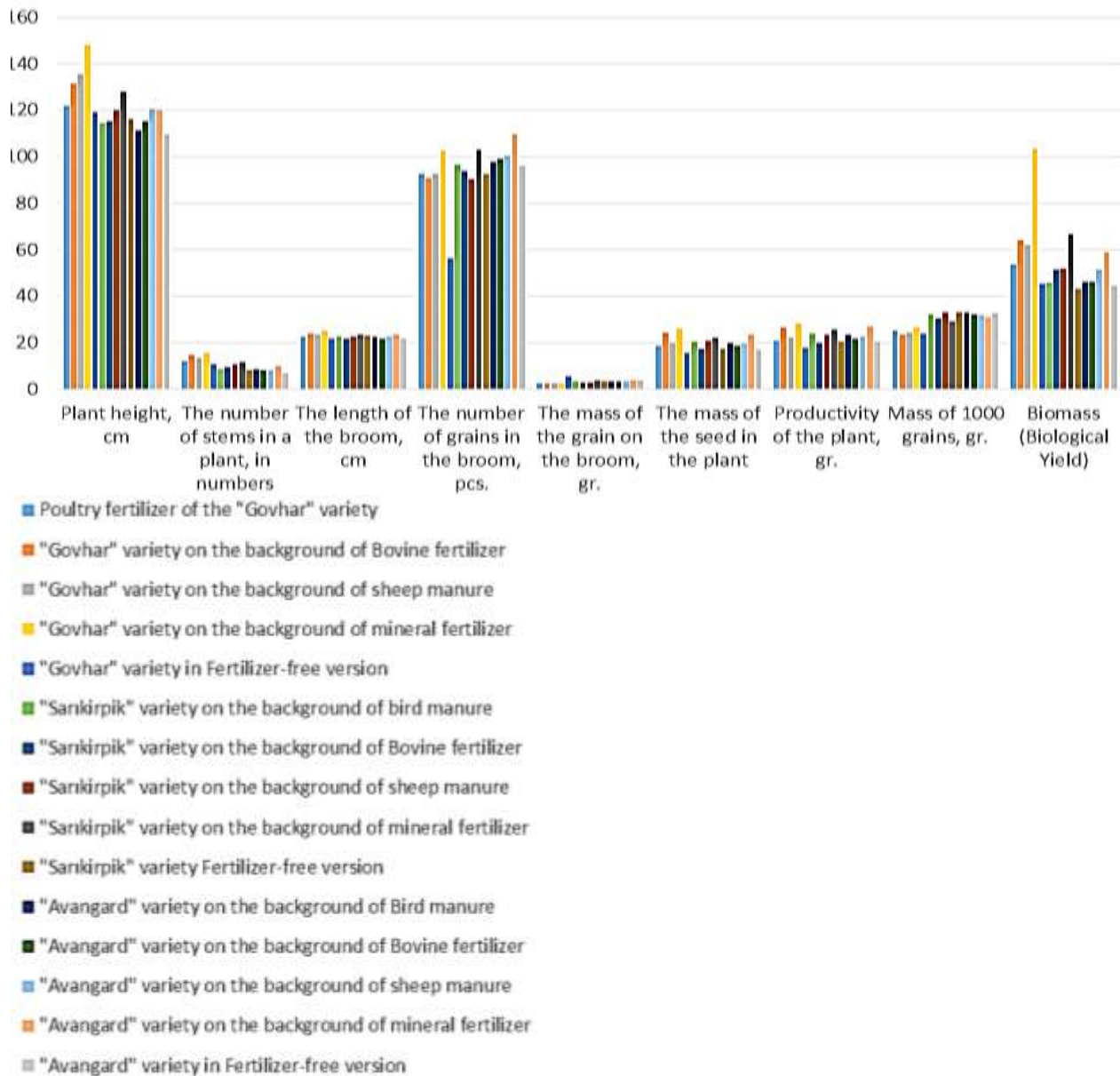


Figure 9. Structural analyzes of rice plant, 2022

Table 3

QUALITATIVE INDICATORS OF THE PADDY PLANT, 2022

The name of the instance	Variants	Mass of 1000 grains, g	Protein, 200 mg	Sugar determination, %	Starch, %	Humidity, %
Govhar 1/1	Poultry manure	18,8	8,03	3,2	70,4	15,2
Govhar 9/1		19	8,03	3,2	70,1	14,8
Govhar 12/3		18	7,61	3,2	70,5	15,3

<i>The name of the instance</i>	<i>Variants</i>	<i>Mass of 1000 grains, g</i>	<i>Protein, 200 mg</i>	<i>Sugar determination, %</i>	<i>Starch, %</i>	<i>Humidity, %</i>
<i>Medium</i>		18,6	7,89	3,2	70,3	15,1
Govhar 2/1	Bovine manure	19,2	7,61	3,2	70,3	15,1
Govhar 10/3		19	8,03	3,2	70,2	14,9
Govhar 13/2		20	8,45	3,2	70,2	14,9
<i>Medium</i>		19,4	8,03	3,2	70,2	15
Govhar 3/1	Sheep manure	18,4	8,87	3,2	70,2	14,9
Govhar 7/1		18,6	7,61	3,2	70,2	14,9
Govhar 14/3		25	10,6	3,2	70,3	15
<i>Medium</i>		20,7	9,03	3,2	70,2	14,9
Govhar 4/1	Chemical fertilizer	18,8	8,87	3,2	70,1	14,8
Govhar 6/2		19,2	8,45	3,2	70,2	14,9
Govhar 15/3		23,6	8,87	3	65,7	14,8
<i>Medium</i>		20,5	8,73	3,13	68,7	14,8
Govhar 5/1	Zero manure	18,6	7,61	3,2	70,1	14,8
Govhar 8/2		18,6	8,03	3,2	70,3	15,1
Govhar 11/3		15	6,34	3,2	70,3	15,1
<i>Medium</i>		17,4	7,33	3,2	70,2	15
Sarikirpik 1/2	Poultry manure	25,6	10,6	3,2	70,3	15,1
Sarikirpik 9/2		25,6	8,0	3,2	70,1	14,8
Sarikirpik 12/1		25,8	8,5	3,2	70,3	15,1
<i>Medium</i>		25,7	9,0	3,2	70,2	15,0
Sarikirpik 2/2	Bovine manure	22,2	8,03	3,2	70,3	15
Sarikirpik 10/1		24,6	8,03	3,2	70,1	14,8
Sarikirpik 13/3		25,2	8,45	2,8	61,5	15
<i>Medium</i>		24	8,17	3,07	67,3	14,9
Sarikirpik 3/2	Sheep manure	24,4	11	3,2	70,3	15,1
Sarikirpik 7/3		25,2	8,45	3,2	70,5	15,3
Sarikirpik 14/2		24	8,45	3,1	68,1	15,1
<i>Medium</i>		24,5	9,3	3,17	69,6	15,2
Sarikirpik 4/2	Chemical fertilizer	24	8,45	3,2	70,1	14,8
Sarikirpik 6/3		24,8	8,45	3,2	70,2	14,9
Sarikirpik 15/2		23,6	8,87	3	65,7	14,8
<i>Medium</i>		24,1	8,59	3,13	68,7	14,8
Sarikirpik 5/2	Zero manure	25,4	11	3	70,1	14,8
Sarikirpik 8/1		24,8	8,45	3,2	69,9	14,6
Sarikirpik 11/1		25,8	10,2	3,2	70,4	15,2
<i>Medium</i>		25,3	9,9	3,1	70,1	14,9
Avangard 1/3	Poultry manure	25,2	8,7	2,8	61,47	15
Avangard 9/3		25,6	8,03	3	65,9	15
Avangard 12/2		26,4	8,03	2,9	63,6	14,9
<i>Medium</i>		25,7	8,25	2,9	63,7	15
Avangard 2/3	Bovine manure	24,2	8,45	3,2	70,2	14,9
Avangard 10/2		25,0	9,72	2,8	61,6	15,2
Avangard 13/1		25,2	8,45	2,7	59,2	14,9
<i>Medium</i>		24,8	8,87	2,9	63,7	15,05
Avangard 3/3	Sheep manure	24,6	8,45	3,1	68,1	15
Avangard 7/2		24,8	8,87	2,8	61,7	15,3

The name of the instance	Variants	Mass of 1000 grains, g	Protein, 200 mg	Sugar determination, %	Starch, %	Humidity, %
Avangard 14/1		24,2	8,45	2,8	61,4	14,9
Medium		24,5	8,59	2,9	63,7	15,1
Avangard 4/3	Chemical fertilizer	24,4	8,45	3,2	70,1	14,8
Avangard 6/1		24,6	9,3	3,3	72,2	14,7
Avangard 15/1		24,2	8,87	2,8	61,3	14,8
Medium		24,4	8,87	3,1	67,9	14,8
Avangard 5/3	Zero manure	24,8	8,87	3,2	70,2	14,9
Avangard 8/3		25,8	8,45	2,9	63,5	14,8
Avangard 11/2		26	8,03	3,2	70,2	14,9
Medium		25,5	8,45	3,1	68	14,9

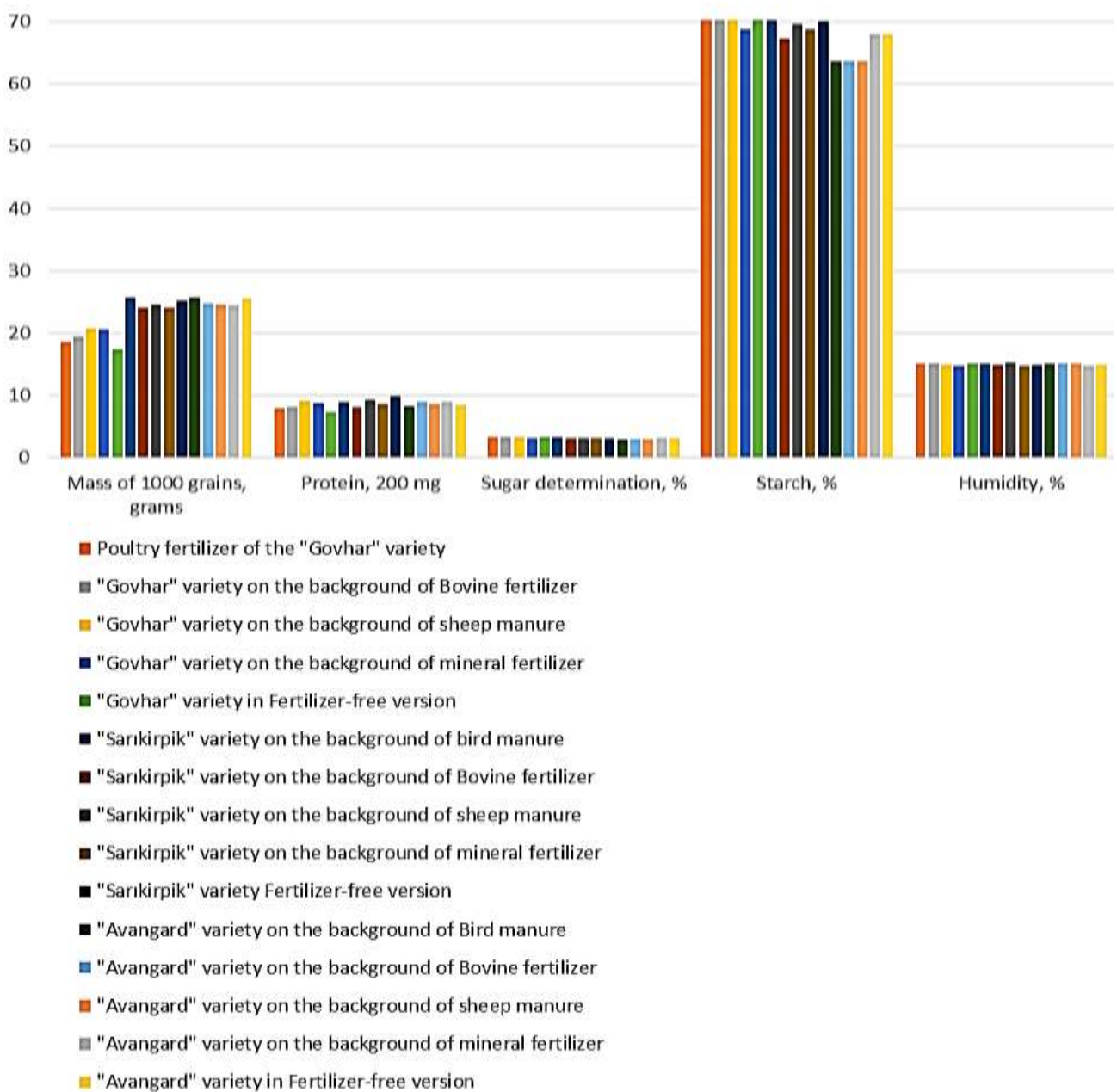


Figure 10. Quality indicators of rice plant, 2022

Conclusion

Recently, some important measures have been realized in the direction of paddy production increase and meeting the population's demand for rice, development of paddy-growing that is one of the traditional areas of agriculture and positive results were obtained.

In the research year, an influence of organic and mineral fertilizers on 3 paddy sorts - Avangard, Sarikirpik and Govhar sorts was studied. The changes occurring in qualitative and quantitative indicators were dynamically and comparatively analyzed, the following results were obtained:

A length of the paddy samples is 109,3-148,0 cm, but the length of the most samples is more than 100,0 cm.

Bushing of the plants was 6,7-15,5 cm depending on separate samples. The highest index according to bushing was noted in Govhar sort on the background of mineral fertilizer.

The length of brooms in plant is minimum — 21,5 cm, maximum — 25,2 cm. The number of the seeds is 56,0-109,4, this index was observed in Avangard sort on the background of mineral fertilizer, in Govhar sort on the background of the sheep manure.

The seed mass differed on sorts and backgrounds, the highest index was 2,0-5,2 grams in Govhar sort. The plant productivity was noted in Govhar (25,5) and Avangard (23,3) sorts on the background of mineral fertilizer.

The plant productivity and mass of 1000 seeds is accordingly 17,6-28,22 g and 23,2-33,1 and they differed with the highest indicators in Govhar, Sarikirpik and Avangard sorts on the background of mineral fertilizer.

Rationality of each research, achievement of its application in private and farmer farms are one of the main issues. For this purpose in June-July and August, in the experimented areas, regional meetings and field days were held with the direct participation of farmers, landowners, large grain farms, large entrepreneurs and specialists of agrarian training centers. Necessary information about new cultivars was given, discussions were held, effective recommendations were given.

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