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HYBRIDS IN RICE BREEDING

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Abstract
The results of interbreeding father and mother forms in the creation of rice varieties are fully presented in this article.

Keywords: Rice, variety, interbreeding.

Introduction

Asia is the leader in world rice production and consumption. Asia accounts for 90% of the world's rice production and consumption, and the most interesting fact is that China and India alone account for 55% of this share. However, some factors caused significant negative changes in rice production. Various factors such as changes in water, soil composition and temperature, as well as air pollution and loss of biological diversity will prove our above statement. The Food and Agriculture Organization of the United Nations estimates that food production will need to increase by 70 percent by 2050 to meet the world's growing demand, the world population is expected to reach 9,7 billion. Paddy rice is rich in nutrients, nutritious and easy to digest. One kilogram of rice contains 4000 calories, Rice husking yields an average of 54% rice, 10% ground grain, 13% residue, 3% flour and 20% bran. Food made from rice cooks very quickly, in the human body it is digested and assimilated faster than other cereals. The absorption coefficient of rice is the highest - 96%, the caloric content is 3594, and that of wheat is 3610. Flour is rarely made from rice, it does not contain a sticky substance (gluten).
When rice is processed, husks and rice scraps are obtained, which are used in the preparation of alcohol and sake, vodka, beer, and preserves. Starch is extracted from

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rice bran and is used in medicine and in the preparation of rice flour. Rice and its products contain protein, fat, starch, ash, fiber and phytin (Table 1),

Table 1. Average chemical composition of rice and its products (in relation to initial dry weight,%)

Products	Protein	Fat	Starch	Ash	Fiber	Phytin
Rice	7,88	2,76	65,85	2,26	9,57	5,72
Rice	8,62	0,48	87,72	0,62	0,19	2,07
Lame	8,98	0,79	88,22	0,73	0,25	1,23
Rice bran	13,86	16,80	39,84	9,22	12,88	7,39
Rice husk	3,07	0,68	26,48	20,34	49,19	0,24

The purpose and objectives of the research work: Creation of fertile initial sources and varieties of rice suitable for cultivation in different regions of our Republic, giving high quality rice. To achieve this goal, the following tasks are performed:

1. Study of primary sources for selection;
2. Breeding of selected parent pairs;
3. Carrying out selections in crossbred hybrid populations;
4. Step-by-step testing of selected samples in nurseries (selection, control and variety selection
test);
5. Submission of promising samples to the State Variety Testing Commission based on the test results, During the study, Eastern Europe (Ukraine, Russia), Central Asia (Uzbekistan), Ancient Asia (Iran, Turkey, India, Pakistan) and Eastern Asia (Pakistan, India, China, Korea, Vietnam, Japan), international centers IRRI and WARDA, as well as 791 collections of local varieties were involved in the selection and crossbreeding of genotypes.

Table 2. Geographical origin of variety specimens in the collection nursery

№	Geographical origin	Name of countries	The number of varieties, pcs
1	Eastern Europe	Ukraine, Russia	21
3	Central Asia	Uzbekistan	425
4	Ancient Asia	Iran, Turkey, India, Pakistan	22
5	Eastern Asia	IRRI, China, Vietnam	315
6	South America	Brazil	5
7	Oceania	Australia	**3**
	Total		**791**

The flowering period of the parent components selected for cross-breeding should be compatible, In the breeding nursery, the best-developed parental forms of local and foreign samples with morphological, biological and valuable economic characteristics were selected from the collection nursery, The breeding process itself consists of preparing the mother plant's cuttings, removing the anthers and pollination of the

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flowers, 1/3 of the leaf blades were selected for breeding, They were opened and the flowering upper and immature lower spikes were removed, leaving 15–20 welldeveloped spikes and the rest were scraped off, The pollinated flowers were isolated with a paper bag and the label was hung.

Interbreeding is a very laborious process, and some hybrids - combinations achieve 3-10% results in different years, After obtaining a hybrid (F_0), the breeder proceeds to breed and select the hybrid progeny.

Results obtained: During the research, a total of 54 combined hybridizations were carried out, of

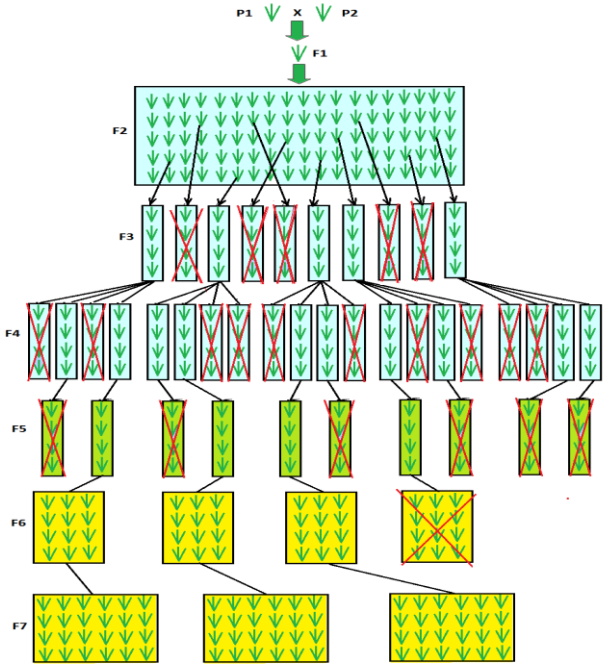
which hybrid seeds were obtained from 21 combinations. Based on the cross-breeding results shown in the table, the most numerous cross-combinations were IR22K1077 x TShD 20-13-1-3-1-1, Sadaf x Lazurniy, S–178 x Ikhlos, Polizesti – Iskandar x Billur, TShD 26-13-1-1-2-1 x Ikhlos, and S–107 x S–117, with 143, 96, 84, 83, and 64 flowers, respectively. In the experiment, it was found that the number of cross-breeding combinations were 1216 pieces.

As for the amount of crossbred seeds, the obtained results were 12 pieces in the foreign and local variety samples Polizesti – Iskandar x Billur, and 9 pieces in the combination of S–178 x Ixlos, IR-21K1002 x Iskandar, In this indicator, a total of 96 hybrid seeds were obtained, which was 7,80 percent of the total crossbreeding presented in the table. These obtained (F_0) hybrids will be planted again in field conditions in the future, and promising varieties will be created on the basis of individual selection.

Table 3. Interbreeding results

№	The name of the combination	Number of crossed rows	Number of flowers	Number of hybrids
1	S–178 x Ixlos	3	96	9
2	TShD 26-13-1-1-2-1 x Ixlos	3	83	7
3	S–178 x Ixlos	2	52	4
4	Sadaf x Lazurniy	5	143	5
5	IR21K1002 x TShD 20-13-1-3-1-1	1	48	3
6	Billur x Lazurniy	1	35	3
7	Sadaf x S–178	2	39	2
8	Billur x Lazurniy	1	42	4
9	S–107 x S–117	3	81	2
10	Polizesti – Iskandar x Billur	3	84	12
11	S–107 x Billur	1	39	2
12	TShD 26-13-1-1-2-1 x Billur	2	63	2
13	IR-21K1002 x Iskandar	2	39	9
14	Osmanchik x Qirgiz-1	1	44	4
15	Qirgiz-1 x Lazurniy	1	37	2
16	Osmanchik x Iskandar	2	43	6
17	IR-21K1002 x Iskandar	1	38	2
18	Iskandar x Yaxont	2	53	3
19	IR22K1077 x TShD 20-13-1-3-1-1	2	64	2
20	Gialoc – 37 x Billur	1	45	9
21	Chokvang x Iskandar	1	48	4
		40	1216	96
7,8 %				

The method of pedigree of F_1 hybrids obtained during the research is to sow the seeds of each plant separately, each plant of the F_1 hybrid is crushed separately from others, stored in bags with numbers and planted separately next year. For example, if 100 hybrid seeds are obtained, next year they will be planted and 100 plants will be obtained, and their seeds will be saved separately and planted again. In this case, each hybrid can be studied joint-by-joint, so that at a certain joint (mostly F_3) invariable (characters and characteristics are stable) generations are formed. Then hybrid generations with similar characters and characteristics are united and can be used in further selection work. Although this method is complicated, it is a very accurate method.



1-figure

The inheritance of plant height, furrow length and weight of 1000 grains in the studied F_1 generation hybrid combinations was determined by the following formula:

$$hp = \frac{F - Mp}{P - Mp}$$

Here:
Hp - is the degree of dominance
F - is the arithmetic mean of the hybrid
R - is the arithmetic index of the paternal or maternal form with a higher index
Mp - is the arithmetic mean of parent forms

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Table 4. Inheritance of plant height, furrow length and 1000 grain weight in F_1 generation hybrids.

№	Name of combinations	Plant height, cm				The length of the panicle				Weight of 1000 grains, g			
		♀	♂	F_1	hp	♀	♂	F_1	hp	♀	♂	F_1	hp
1	S–178 x Ixlos	92,3	104,5	103,2	0,78	15,3	16,7	17,1	1,5	25,0	27,8	28,8	0,28
2	TShD 26-13-1-1-2-1 x Ixlos	130,3	123,1	129,1	0,66	19,0	20,4	20,6	1,2	30,1	34	30,7	0,25
3	S–178 x Ixlos	131,1	130,3	131,0	0,49	21,4	19,1	20,5	0,2	33,3	30,0	33,7	1,23
4	Sadaf x Lazurniy	123,1	105,7	122,1	0,88	20,4	18,6	21,0	1,6	32	30,5	31,7	0,70
5	IR21K1002 x TShD 20-13-1-3-1-1	104,5	123,1	114,1	0,02	16,7	20,4	17,8	-0,3	27,8	32	29,4	-0,21
6	Billur x Lazurniy	131,1	123,1	129,8	0,67	21,4	20,4	21,8	1,7	33,3	32	33,1	0,56
7	Sadaf x S–178	131,1	125,5	129,6	0,45	21,4	21,1	22,0	5,0	33,3	32,5	33,1	0,49
8	Billur x Lazurniy	104,5	129,0	115,4	-0,10	16,7	20,7	18,4	-0,2	27,8	33,4	29,1	-0,53
9	S–107 x S–117	123,1	125,5	126,3	1,66	20,4	21,1	22,0	3,5	32	32,5	32,3	0,32
10	Polizesti – Iskandar x Billur	121,4	125,5	122,0	-0,70	18,7	21,1	20,7	0,6	31,8	32,5	22,9	-0,70

Conclusion:

It is appropriate to use local and foreign varieties of Uzbekistan and IRRI, China, in the crossbreeding of rice varieties.

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