European Journal of Molecular & Clinical Medicine
ISSN 2515-8260 Volume 08, Issue 01, 2021

The Field Of Rice In The Republic Development Prospects And Challenges

B.I.Qalandarov[1], M.Y.Xayitov[2], M.A.Ergashev[3], M.Axtamov[4]

[1,2,3,4]Rice Research Institute

Abstract: The article obtained hybrid seeds of rice using local and foreign varieties and samples for resistance to diseases and pests, shedding and lodging in field conditions, depending on biological and valuable economic characteristics, and determined the salt tolerance of the ridges on the basis of marker proteins. However, in the primary source nursery, the ridges were studied on valuable economic indicators and 10 ridges as early maturing ridges and 9 ridges as middle and late ridges were selected for use in future research as generations.

Key words: rice, selection, ridge, varietal, saline, productive accumulation, yield, grain size, marker proteins, molecular, enzymatic activity.

1. INTRODUCTION

In our country, rice is grown mainly as a primary and secondary crop in the Republic of Karakalpakstan, Khorezm, Tashkent, Syrdarya, Surkhandarya and Fergana, Andijan and Namangan regions on an area of about 114,000 hectares. The average yield is 35-38 centners per hectare, the gross yield is 421,000 tons. This amount only minimizes the growing demand of the population for rice, one of the main food products of our country. According to official data, about 35,000 tons of rice products are imported annually to fully meet the needs of the population.

In rice, a regular increase in yield is the basis for growing a gross crop. Because the land and water resources on earth are not infinite. Therefore, in carrying out this task, it is important to create high-yielding intensive type varieties of rice selection. This, in turn, poses new challenges for scientists in the field.

The purpose of the study. Through individual selection in rice selection, selection of foreign and domestic rice varieties that are quick to adapt to adverse environmental factors, resistant to lodging and shedding.

Tasks of the research: Depending on the purpose of the topic, the research work includes the following tasks.

- Depending on the purpose of the topic, the research work includes the following tasks.;
- Study, evaluation and selection of varietal samples, hybrids and ridges as primary sources, valuable economic characteristics, adaptability to adverse environmental factors and disease resistance.

REFERENCES

In the process of emergence and development of selection, several methods of creating new varieties of plants have been developed and widely used in practice. Existing methods of selection are divided into analytical and synthetic types. An analytical method of selection of a new variety by selecting from existing plant populations or native varieties in nature is a synthetic method of seed selection by first modifying plant genetics in various ways and then selecting from altered plants (hybrids, mutants, populations) [1] .

In the early stages of rice selection, mass and individual selection, i.e. analytical selection, was used because of the selection of other crops. As a result of mass selection in the short term created a number of varieties from the native varietal populations of Central Asia and the Far East with improved morphological features, a uniform (uniform) in length of the growing season, valuable economic characteristics (not shedding, not lying down)

[2]. In particular, T. Iskhakov together with a group of selection scientists in 2005 selected 13 plants from the Alanga variety of rice (on the basis of individual selection), sowed the seeds of each plant separately in the field, studied and tested under the same conditions, to achieve the best result among 13 generations.) distinguishes the generation that has. The selected lines are analyzed and the third (best) line is selected from them. By studying, testing and reproducing this line, a medium-ripe Alexander variety of ultra-plastic, high-yielding, durable, high-quality rice, which will be planted in many areas in the future, will be created. Thus, the Alexander variety is a product of analytical selection [3].

Breeding varieties created on the basis of analytical selection, i.e. natural population - selection from local varieties, often retain the character and characteristics of the original plants from which they originated. They do not have well-developed features such as high yield, product quality, resistance to lodging and disease. Varieties with such a set (complex) of traits and characteristics can be created by hybridization [4, 5, 6]. In our country, such varieties of rice as Lazurniy, Guljahon, Ilgor, Mustaqillik, Nukus-2, Avangard, Tarona have been created by cross-breeding varieties with a set of characteristics such as yield, product quality, resistance to lodging and diseases [7,8].

More than 200 varieties of rice, including IR32, IR36, IR40, IR42, IR64 and IR72, have been created in the classical method at the International Rice Research Institute (IRRI). IR64 is the most widely grown rice variety in the world. Because the growth period is short (110 days), the yield index is 0.55. This variety has multiple and long-term resistance to pests and diseases, resistance to abiotic stresses, wide flexibility, and good response to agronomic practices and management [9].

To date, research on the creation of rice hybrids has been developed in Southeast Asian countries such as Sri Lanka [10], India [11], China [12], the Philippines [13,14], Vietnam [15, 16,17,18], and Bangladesh. created hybrid varieties are grown in the main areas in these countries.

Currently, a number of modern advanced methods are used in the selection to create new varieties [19, 20, 21]. In large rice-growing countries, special research institutes have been established in the areas where selection work is carried out [22, 20]. Here varieties of rice are being developed that are resistant to fungal diseases, lodging and frost, efficient use of

fertilizers, short, more than grain-straw, suitable for mechanization, high technological qualities of grain.

The Anait rice variety was developed in the Russian Federation [23], and by mixing the Australian variety with KPu-92-08, it was possible to create primary sources of low-altitude, drought-resistant erectroid-type rice. In order to create high-yielding varieties using the DNA marker method, abiotic and biotic factors: soil salinity, long-term water retention in rice fields, pirikulariosis disease and drought-resistant primary sources were evaluated.

By mixing the Moroberekan and Ilpumbueo [24] varieties, South Korean scientists created a dormant Hwaweon 7 variety using MAS selection techniques.

Selection work in the United States is characterized by high productivity, low growth of grasses, resistance to low temperatures of air and irrigated water in all phases of vegetation, saline soils and mineralized, irrigated, water, disease and pest resistant, tall, wide plastic, culinary and technological focuses on a complex (complex) of valuable traits and properties, such as high quality and high protein content. In particular, Californian scientists have developed a special variety of Go-2XL and Goal Tender herbicide-resistant oxyfluortene M-206 [26], Clerafield herbicide-resistant varieties CL163, CL151, CL153, CL172, CL111, CL272 [25]. They are also using disease and herbicide-resistant varieties using MAS selection methods to create high-quality and fragrant rice varieties [26].

Today, due to global climate change, the area of saline soils is increasing, and there is a significant shortage of water for growing crops [27]. Improving salt tolerance in crop varieties is one of the possible strategies to overcome salinity problems in agriculture [28]. The creation of salt-tolerant varieties using traditional selection programs has been carried out very slowly due to the complexity of salt-resistance [29, 30, 28]. However, scientists around the world are paying more attention to the creation of varieties resistant to abiotic factors in agriculture, including rice, in order to obtain a rich and high-quality crop [31, 32, 33, 34, 35, 36, 37, 38, 39, 40].

Most abiotic stresses are related to water (drought and excess water), soil problems (salinity, lack of nutrients, and toxicity), and extreme temperatures (heat and cold). These stresses vary with seasonality. They negatively affect the growth and productivity of rice, which leads to low yields. Abiotic stresses are limiting factors in the rice cultivation environment in almost all dry and irrigated lands [41].

In India, a number of rice varieties resistant to different levels of soil salinity have been developed to combat the salt problems associated with a particular state. In particular, Uttar Pradesh has a very high stress-resistant CSR 10; high stress resistant CSR 13, CSR 27, Narendra Usar 2 and medium stress resistant Narendra Usar3, Pokkali, Vytilla 1, Vytilla 2, Vytilla 3, Vytilla 4 and Vytilla 5 varieties for coastal soils of Kerala, Orissa, Kalarat and Bhurarat for SR 26 B variety, Panvel 1, Panvel 2, Panvel 3 varieties for Maharashtra have been developed and are widely used in production [42].

Bataeva et al. [43] conducted a comprehensive screening of the salt resistance of local and foreign selection rice varieties at the Kazakhstan Rice Research Institute. In experiments, the strongest damage to the rice plant was carbonate salinity, followed by chloride and sulfate effects.

In recent years, increasing the net productivity of photosynthesis remains one of the main directions in the selection of rice for productivity. In this regard, small thick dark green leafy dwarf and semi-dwarf plants located in a not-so-vertical form are very promising. Such leaves use more light to distribute it evenly among the plant and reduce the intensity of respiration [44].

The growing season of the created varieties should be in accordance with the appropriate conditions under which rice is grown. That is, it is advisable to create early-ripening varieties for the northern regions, medium-ripening and late-ripening varieties for the southern regions [45].

Previously, the quality of the crop was evaluated on two or three indicators (yield, grain and color of whole rice). output, water absorption and weight gain during cooking, weight of 1000 grains, etc. High-quality varieties include elongated, slender-grained and thin-stemmed, smooth, unbroken, clear vitreous endosperm varieties. Such varieties are highly valued in the world market [46].

Creating varieties of rice resistant to fungal diseases and pests is an important requirement for breeders for all regions where rice is grown.

According to the FAO, the disease kills more than 10% of the crop (about 40 million tons) in rice-growing countries each year. The most effective and promising of the control measures is the creation of resistant varieties [47].

In addition, in the creation of rice varieties, breeders bypass the developmental stages during the growing season, especially the simultaneous ripening of plants in the field, which can be achieved by selecting plants with a flowering period of 10-12 days. In new varieties, the plant leaves should be broad, relatively short, in a vertical position, well tolerated in saline soils, and have a good ability to germinate even when the field is irrigated. In recent years, wild forms of rice have been widely involved in selection work, as most of them have traits that are absent or underdeveloped in the species O. sativa and O. glaberrima.

2. CONDITIONS OF THE RESEARCH, SOIL, WEATHER.

According to the direction of research and the work plan, it was placed on the experimental field of the Rice Research Institute. The experimental fields of the Institute are located in the south-eastern part of the Tashkent region, on the left bank of the Chirchik River, geographically 41 ° 11'16 "north latitude, 69 ° 20'07" east longitude.

2.1. Soil conditions of the study area.

The topography of the area is flat, the soil layer in the experimental fields consists of gray meadow and meadow swampy soils, and the soil is suitable for the soils of the riverbanks. Sand and large and small stones lie in different depths.

Table 2.1.1

Mechanical composition, salinity and pH of the soil of the experimental area.

Depth, cm	**The**	**Mechanical**	**Salinity**	**pH**

	amount of physical mud, %	**structure**	**type**	**degree**	**content**
0-30	51,9	Medium sand	Sulfate	Not salted	7,3

The driving layer is 0-30 and 0-40 cm, below the driving layer is a layer of gel 30-40 cm thick, at a depth of 60-70 cm there is a layer of sand and small stones. The sandy and fine-grained layer is also found at 30-40 cm in some parts of the experimental area.
There are no mineral salts due to the fact that the soils of the experimental area are composed of sand and small stones, and the groundwater flows from the north-east to the south-west.

Table 2.1.2
The amount of humus and nutrients in the soil of the experimental area.

Depth, cm	**Humus, %**	**Nitrogen N-NO_3 mg / kg**	**Phosphorus P_2O_5 mg / kg**	**Potassium K_2O mg / kg**
0-30	1,86	22,4	84	17,6

When the rice paddies are filled with water, the groundwater varies between 0.5-1.0 meters depth. When the rice fields are not filled with water, the groundwater begins to deepen, which lasts from November to February and is 1.5-1.6 m.

2.2. Climatic conditions.
Air temperature and relative humidity vary in different years. These meteorological factors have a significant impact on the growth and development of rice, as well as other agricultural crops.
According to long-term data from the Tuyaboguz meteorological station, the average air temperature during the year is 12.3 degrees, and the highest air temperature in July is +34.5 degrees. The coldest temperature is -6-8 degrees in January, and in some years it can drop to 10-15 degrees. But winter rarely comes cold.

2.3. EXPERIMENTAL METHOD
Field experiments Based on the methodology of the All-Russian Rice Research Institute [38], statistical analysis of the results obtained Dospekhov B.A. method [15].

3. EXPERIMENTAL RESULTS.

3.1. Mixing and hybrid seedlings.
In the cross-breeding nursery, 30 parental forms selected from the collection nursery based on morphological, biological and valuable economic characteristics were planted in buckets in 3 terms. The best developed plants were selected in planted buckets.
The following work was done before mixing:

- The mother plant was cut and the pollen was removed mechanically (castration);
- Pollination was carried out by all pollinators and compulsory free method:
- Pollinated flowers were insulated with a paper bag and hung on a label.

In the reporting year, a total of 2188 flowers were mixed in 28 different combinations using 15 local and foreign varieties and samples. As a result of mixing, 117 hybrid seeds were obtained, which is 5.35% of the total mixing (Table 3.1.1.).

Given that the F0 hybrid seeds obtained as a result of hybridization were very delicate, they were first collected in a laboratory thermostat at + 28 ° C for 7 days and the young plants were transplanted into paper trays filled with fine soil and cared for until they had 2-3 leaves. Then the field was transplanted into rows.

Seeds of 4 F1, 13 F2, 45 F3, 4 F5,13 F6 and 16 individual selection hybrid populations were sown in 6 rows per 1 m2 area at a rate of 500 seeds / m2. Phenological and morphological observations were made at all phases of the growth period (germination, accumulation, tubing, flowering and ripening).

Table 3.1.1. Confusion results

№	Combination		Number of flowers mixed (pieces)	The amount of seeds mixed	
	♀	♂		Pieces	%
	Sonnet	Alexander	105		
	Sonnet	TShD 15-13-1-1-1-1	75		
	Sonnet	Chongwan	16		
	Sonnet	227-09	55	1	
	Polizesti	Alexander	110	17	
	TShD 20-13-1-1-1-1	Alexander	120	9	
	TShD 20-13-1-1-1-1	TShD 15-13-1-1-1-1	35	7	
	Jinbu	TShD 15-13-1-1-1-1	18		
	Jinbu	Chongwan	90	6	
	Jinbu	TShD 20-13-1-1-1-1	56	7	
	Chongwan	TShD 15-13-1-1-1-1	75	18	
	Chongwan	Sonnet	46	1	
	Chongwan	Alexander	85	5	
	Chongwan	227-09	74	1	
	Sanam	Alexander	150	2	
	Nukus-2	Chongwan	40		
	Nukus-2	Alexander	90	11	
	Nukus-2	Osmancik-97	33	12	
	Osmancik-97	Chongwan	110		
	Osmancik-97	Alexander	95		

№	Combination		Number of flowers mixed (pieces)	The amount of seeds mixed	
	♀	♂		Pieces	%
	Osmancik-97	TShD 26-13-1-1-1-1	50		
	TShD 15-13-1-1-1-1	Chongwan	70		
	TShD 15-13-1-1-1-1	Alexander	105	7	
	TShD 15-13-1-1-1-1	Sonnet	130	8	
	Sitora	TShD 15-13-1-1-1-1	70	2	
	Sitora	Alexander	50	1	
	Sitora	TShD 20-13-1-1-1-1	85	2	
	Dunay	Alexander	150		
	Total		**2188**	**117**	**5,35**

Salinity of varieties and ridges on the basis of marker proteins was determined by two methods: salinity in the laboratory and enzymatic activity in the molecular state. Some samples demonstrated double salt resistance.

In samples 2,3,8,10, stress proteins were actively demonstrated under saline conditions. Samples TShD 11-15-1-3-3-1 and TShD 11-15-1-2-1 as standard varieties were found to be resistant to all-round salinity.

Molecular markers of enzyme activity (Glucose 6-phosphate dihedrogenase) in rice samples were investigated, and some samples were evaluated as salt-resistant in terms of enzyme activity.

As a result of the observations, 21 hybrid populations were selected for cross-breeding on the basis of salinity, disease, sedimentation and shedding of saline, disease, sedimentation and shedding, as well as early maturity and morphological features of leaf verticality, medium height, absence of grain stalks.

3.2. Selection nursery

This year, Guljahon, Iskandar and control over this nursery

With UzROS 7-13 varieties, 173 ridges were planted by hand using a template on an area of 2 m2 each. In this nursery, the best elite plant generations (joints) selected from the collection and hybrid seedlings were initially evaluated on the basis of valuable economic characteristics, and the best generations (joints) were selected for study and reproduction in subsequent years. The seeds of the isolated generations according to their valuable economic performance were tested for sowing in the nursery.

According to the results of research in the nursery, during the observation of germination of varieties, the seeds germinated completely in 11-12 days in all plots.

During the growing season, phenological observations were made on the basis of a manual developed by the Variety Testing Commission and the phases of germination, accumulation, germination, flowering and ripening were recorded. Depending on the growing season, 31

varieties were assigned to the early maturing group, 82 to the middle maturing group and 60 to the late maturing group.

During the study period, each specimen of the nursery was evaluated in terms of morphological appearance, and model links were obtained for biometric analysis. According to the results of the analysis (Table 3.2.1.) As early maturing ridges SP-5, SP-8, SP-49, SP-66, SP-87, SP-96, SP-100, SP-110, SP-114 as, SP-14, SP-21, SP-97, SP-105, SP-109, SP-72, SP-85, SP-86, SP-116 as late ridges, SP-4, SP-18, SP -25, SP-30, SP-31, SP-41, SP-46, SP-90, SP-93 ridges were selected by comparison with standard varieties.

Table 3.2.1
The main valuable economic indicators of selection nursery varieties.
(Ertapisharlar Group)

№	Variety and sample name	Botanical species	growth period	plant height (sm)	Spike length. (middle) (cm)	Productive accumulation	Weight of 1000 grains	Productivity ts / ha	Endurance, points	
									To go	Diseases
1	Guljaxonst	*var. vulgaris Korn*	115-117	124-127	21,8	2,3	32,1	68,6	4,5	0
2	SP-5	*var. Gilanica Gust*	109-112	110-112	22,5	2,2	33,3	69,3	5	0
3	SP-8	*var. Nigro-apaculata Gust*	111-113	103-109	22.8	2,3	33,2	67,1	5	0
4	SP-49	*var. Gilanica Gust*	110-112	114-118	22,2	2,2	30,8	65,5	4	0
5	SP-66	*var. vulgaris Korn*	112-114	113-115	22,3	2,3	31,9	64,7	5	0
6	SP-87	*var. Italica Alef*	110-113	115-118	22,1	2,4	32,3	69,2	5	0
7	SP-96	*var. Suberythroseros Korn*	108-112	105-110	22,4	2,2	33,2	69,2	5	0
8	SP-100	*var. Gilanica Gust*	111-113	109-112	21,7	2,4	33,0	68,8	5	0
9	SP-110	*var. Nigro-apaculata Gust*	101-104	113-117	21,3	2,2	32,4	68,5	4	0
10	SP-114	*var. Gilanica Gust*	108-113	98-102	22,5	2,4	32,7	69,3	5	0

Table 3.2.1 (continued)
The main valuable economic indicators of selection nursery varieties.
(Middle group)

№	Variety and sample name	Botanical species	growth period	plant height (sm)	Spike length. (middle) (cm)	Productive accumulation	Weight of 1000 grains	Productivity ts / ha	Endurance, points	
									To go to	Diseases
1	Iskandar st	*var. Erithoceros Korn*	122-126	126-129	23,5	2,4	33,9	78,9	5	0
2	SP-14	*var. Gilanica Gust*	124-126	127-129	24,9	2,4	34,5	81,9	4	0
3	SP-21	*var. Erithoceros Korn*	125-128	128-130	22,8	2,4	34,7	82,3	5	0
4	SP-97	*var. Gilanica Gust*	123-127	127-130	23,6	2,5	34,4	81,2	5	0
5	SP-105	*var. Italica Alef*	125-126	122-127	24,1	2,3	33,9	80,4	5	0
6	SP-109	*var. Bastica*	125-127	131-133	24,8	2,4	34,5	79,9	5	0
7	SP-72	*var. Suberythroseros Korn*	124-126	123-126	23,7	2,4	34,8	80,6	5	0
8	SP-85	*var. Gilanica Gust*	125-128	130-134	23,2	2,5	35,3	80,7	5	0
9	SP-86	*var. Italica Alef*	124-129	129-133	22,8	2,3	34,3	81,8	4	0
10	SP-116	*var. Italica Alef*	123-125	129-131	23,3	2,4	33,3	82,3	5	0

Table 3.2.1 (continued)
The main valuable economic indicators of selection nursery varieties.
(Evening group)

№	Variety and sample name	Botanical species	growth period	plant height (sm)	Spike length. (middle) (cm)	Productive accumulation	Weight of 1000 grains	Productivity ts / ha	Endurance, points	
									To go to	Diseases
1	Uzros 7-13 st	*var. subvulgaris Brsches*	134-139	126-128	20,8	2,7	30,4	85,4	4,5	0

2	SP-4	*var. vulgaris Korn*	137-139	136-137	21,5	2,6	31,1	88,3	4	0
3	SP-18	*var. subvulgaris Brsches*	136-138	129-131	20,6	2,8	32,3	88,5	5	0
4	SP-25	*var. Italica Alef*	134-136	143-145	19,9	2,6	31,8	86,8	5	0
5	SP-30	*var. Gilanica Gust*	130-132	141-143	25,1	2,7	33,4	88,4	4	0
6	SP-31	*var. subvulgaris Brsches*	128-134	132-134	24,5	2,6	33,7	86,9	5	0
7	SP-41	*var. Italica Alef*	131-136	131-132	23,8	2,6	32,9	86,7	4	0
8	SP-46	*var. Gilanica Gust*	133-135	140-142	24.2	2,7	31,5	87,8	5	0
9	SP-90	*var. zerafshanica*	130-134	134-138	23,7	2,5	32,1	86,6	5	0
10	SP-93	*var. Italica Alef*	130-132	141-143	23,1	2,6	30,6	88,6	4	0

4. CONCLUSION

- In the reporting year, a total of 2188 flowers in 28 different combinations were mixed between the ridges using 15 local and foreign varieties and specimens in terms of resistance to diseases and pests, shedding and dormancy in field conditions, depending on biological and valuable economic characteristics. As a result of mixing, it was observed that hybrid seeds were obtained from 117 or 5.35% of the total number of mixed flowers.
- When determining the salt tolerance of varieties and ridges on the basis of marker proteins. Some samples demonstrated double salt resistance. Stress proteins were actively demonstrated in saline conditions in samples 2,3,8,10, and TShD 11-15-1-3-3-1 and TShD 11-15-1-2-1 samples were found to be resistant to salinity in all respects as standard varieties.
- 173 ridges of Guljahon, Iskandar and UzROS 7-13 varieties were studied in the primary source nursery and SP-5, SP-8, SP-49, SP-66, SP-87, SP-96, SP-100, SP-110, SP-114 as intermediate ridges, SP-14, SP-21, SP-97, SP-105, SP-109, SP-72, Sp-85, SP-86, SP-116 as late ridges, It was found expedient to distinguish them as SP-4, SP-18, SP-25, SP-30, SP-31, SP-41, SP-46, SP-90, SP-93 ridges.
- Generations separated on the basis of their valuable economic indicators were transferred for use in future research.

5. REFERENCES:

[1] Abdukarimov D.T. Khusiy selection T. 2007.
[2] Abdukarimov D.T. Қishloқ khўzhalik ekinlari selectionasi va uruғchiligi. Toshkent. 2002.
[3] Galandarov B.I., Saydakhmedova M.E., Khayitov M.Y., Mallaev Zh.I. “Sholi duragailarida heterosis of khodisasini ўrganish” SEDЎITI Halқaro ilmiy-amaliy conference maқolalar teplami. Andijon. 2011th. 48-50 betlar.
[4] Kalandarov BI, Khayitov M.Y., Saidakhmedova M.E., Sattarov M.A., Meliev S. “Sholi nav namunalaring nav yaratish bosқichlaridagi biometrics kursatkichlari” ToshDAUR Republic of Ilmiy-Amaliy conferences tўplami –Toshkent. 2013th. 95-99 betlar.
[5] Kalandarov B.I. “Identification of heterozygosity of rice hybrids in the first and second generations” ЎzSHITI Republic of ilmiy-amaliy materiallari conference - Toshkent: 2013.
[6] Galandarov B.I., Saidakhmedova M.E., Sattarov M.A., Khayitov.M.Y, Rakhmonov M.Zh. “Duragailash va duragai kchatzori” ЎzSHITI Republic of ilmiy-amaliy conference materialari - Toshkent: 2013.
[7] Saydakhmedova M.E., андalandarov B.I., Khayitov M.Y. “Sholining yangi istiқbolli ertapishar navlari” SEDЎITI Halқaro ilmiy-amaliy conference maқolalar teplami. Andijon. 2011 47-48 betlar.
[8] Kalandarov B.I., Saydakhmedova M.E., Mallaev Zh.I., Khayitov M.Y. “Sholi kollektsi namunalari nav yaratishdagi ahamiyati” ЎZSHITI republic of ilmiy-amaliy konfrentsiyasi maқolalar teplami. Toshkent. 2011 13-16 betlar.
[9] Junichi T. Takeshi H. Hiroyoshi I. A practical, rapid generation-advancement system for rice breeding using simplified biotron breeding system. Breeding Science 66: 542–551 (2016) doi:10.1270/jsbbs.15038
[10] Abeysekera S.W. and JayawardenaS.N. Potentials and limitations of hybrid riceproduction in Sri Lanka. Proceedings of the 6th International Hybrid Rice Symposium, 10-12 September 2012,Hyderabad, India. Los Baños (Philippines): International Rice Research Institute. 328 p.
[11] Viraktamath B.C., Hari Prasad A.S., Ramesha M.S., Senguttuvel P., Revathi P., and KempaRaju K.B..Hybrid rice research and development inIndia.Proceedings of the 6th International Hybrid Rice Symposium, 10-12 September 2012,Hyderabad, India. Los Baños (Philippines): International Rice Research Institute. 328 p.
[12] LuoJu, Cao Liyong, and Cheng Shihua.Progress in hybrid rice research anddevelopment in China.Proceedings of the 6th International Hybrid Rice Symposium, 10-12 September 2012,Hyderabad, India. Los Baños (Philippines): International Rice Research Institute. 328 p.
[13] Thelma F. PadolinaThe hybrid rice breeding program in the Philippines. Proceedings of the 6th International Hybrid Rice Symposium, 10-12 September 2012, Hyderabad, India. Los Baños (Philippines): International Rice Research Institute. 328 p.

[14] Xie F, Hardy B, editors. 2009. Accelerating hybrid rice development. Los Baños (Philippines): International Rice Research Institute. 698 p.
[15] Nguyen Tri Hoan. Recent achievements in research anddevelopment of hybrid rice in Vietnam. Proceedings of the 6th International Hybrid Rice Symposium, 10-12 September 2012,Hyderabad, India. Los Baños (Philippines): International Rice Research Institute. 328 p.
[16] Nguyen Thi Lang. Rice breeding for high-yielding & good cooking qualities in the mekong delta. Omonrice 18: 34-40 (2011)
[17] Nguyen Thi Lang, Tran ThiThanhXa, Trinh ThiLuy and Bui Chi Buu. Rice breeding for grain quality in the mekong delta. Omonrice 19: 54-60 (2013).
[18] Virmani SS, Mao CX, Hardy B, editors. 2003. Hybrid rice for food security, poverty alleviation, and environmental protection. Proceedings of the 4th International Symposium on Hybrid Rice, Hanoi, Vietnam, 14-17 May 2002. Los Baños (Philippines): International Rice Research Institute. 407 p.
[19] Junichi T. Takeshi H. Hiroyoshi I. A practical, rapid generation-advancement system for rice breeding using simplified biotron breeding system. Breeding Science 66: 542–551 (2016) doi:10.1270/jsbbs.15038
[20] Kushwaha U. K. S *et al.*: Modification of Rice Breeding Technology in 21st Century. International Journal of Bioinformatics and Biomedical Engineering Vol. 1, No. 2, 2015, pp. 77-84 http://www.aiscience.org/journal/ijbbe
[21] Malali Gowda, R.C. Venu, K. Roopalakshmi, M.V. Sreerekha and R.S. Kulkarni. 2003. Advances in rice breeding, genetics and genomics. Molecular Breeding 11: 337–352.
[22] Khush, G.S and P.S. Virk. 2000. Rice breeding : Achievements and future strategies. Crop Improv., 27(2) : 115-144.
[23] Ostapenko N. V., Djamirze R. R., Lotochnikova T. N., Chinchenko N. N. Dynamics of qualitative changes in the characteristics of the grain sortaAnait. Risovodstvo. №3 (36) 2017. 6-16.
[24] Dong-Min Kim, Ju-Won Kang, Yeo-Tae Yun, Hyun-Sook Lee, In-Kyu Park, and Sang-Nag Ahn. A New High-yielding Rice Variety 'Hwaweon 7' with Lodging Tolerance. Korean J. Breed. Sci. 49(3):250-255(2017. 9) https://doi.org/10.9787/KJBS.2017.49.3.250
[25] 2018 Rice varieties and management trips. California Cooperative rice research foundation. www.crrf.org
[26] 2017 Rice breeding progress report. California Cooperative rice research foundation. January 30, 2018. www.crrf.org
[27] Ahmed, A., Diwan, H. and Abrol, Y.P. (2010) Global climate change, stress and plant productivity. In: Pareek, A., Sopory, S.K., Bohnert, H.J. and Govind, J. (eds) Abiotic Stress Adaptations in Plants: Physiological, molecular and genomic foundations. Springer, Dordrecht, Netherlands, pp. 503–522.
[28] (78). Yamaguchi T, Blumwald E (2005) Developing salt-tolerant crop plants: challenges and opportunities. Trends Plant Sci 10:615-620.

[29] Akter S., Yasmeen R, Ahmed H.U, Sarker M.R.A., Rahman M. S. Salinity Tolerance of Some Elite Rice Breeding Lines at Reproductive Stage. BangladeshRice J. 18(1&2): 33-37, 2014.
[30] Khush G.S. 1997. Origin, dispersal, cultivation and variation ofrice. Plant Mol. Biol. 35: 25–34.
[31] Zelenskiy G. L., Zelenskiy A. G., Skorkina S. S., Romashchenko T. A., Tsogoeva V. V. Selection of rice on povышenie ustoychivosti k vozdushnoy zasuxe. Drawings № 3-4 (32-33) 2016. Pages 9-13.
[32] Kostylev P. I., Krasnova E. V., Redkin A. A., Kalievskaya Yu. P. Napravleniya selektsii risa na ustoychivost k stress-faktoram. Drawings № 3-4 (32-33) 2016. Pages 28-34.
[33] Sattarov MA, Kalandarov BI, Saydaxmedova ME, Khayitov.MY, "Assessment of perspective varieties and varieties of salt on salinity" SEG'DO'ITI Gallaorol branch. Proceedings of the International Scientific-Practical Conference. Jizzax-2013y
[34] Skajennik M.A., Dzyuba V.A., Kovalev V.S., Garkusha S.V., Dubina E.V., Chuxir I.N., Savenko E.G., Pshenitsyna T.S. Creation and improvement of the source material in the selection of cold varieties of rice. Risovodstvo. №3 (36) 2017. 21-29.
[35] Tur N.S. Otsenka risa on soleustoychivost. Krasnodar, 1981.36. Akter S., Yasmeen R, Ahmed H.U, Sarker M.R.A., Rahman M. S. Salinity Tolerance of Some Elite Rice Breeding Lines at Reproductive Stage. BangladeshRice J. 18(1&2): 33-37, 2014.
[36] Bui Chi Buu, Truong Quoc Anh, Bui Phu Nam Anh, Nguyen Nam, Luong The Minh, Nguyen The Cuong, Hoang Van Bang, Truong Vinh Hai1, Luu Van Quynh, Nguyen Van Hieu, Bui Phuoc Tam, Pham Thi Thanh Ha, Chau Thanh Nha and Nguyen Thi Lang. Rice breeding for heat tolerance at initial stageOmonrice 19: 1-10 (2013)
[37] Deepa Sankar et al. Rice breeding for salt tolerance. Research in Biotechnology, 2(2): 1-10, 2011.
[38] Flowers TJ (2004) Improving crop salt tolerance. J Exp Bot55:307-319.
[39] Rolando O. T., Kenneth L. M, Casiana V. C., Rachid S, Amelia H. Screening of rice Genebankgermplasm for yield and selection of new drought tolerance donors. Field Crops Research 147 (2013) 12–22. http://dx.doi.org/10.1016/j.fcr.2013.03.016
[40] Ahmed, A., Diwan, H. and Abrol, Y.P. (2010) Global climate change, stress and plant productivity. In: Pareek, A., Sopory, S.K., Bohnert, H.J. and Govind, J. (eds) Abiotic Stress Adaptations in Plants: Physiological, molecular and genomic foundations. Springer, Dordrecht, Netherlands, pp. 503–522.
[41] Deepa Sankar et al. Rice breeding for salt tolerance. Research in Biotechnology, 2(2): 1-10, 2011.
[42] Bataeva D. S., Usenbekov B. N., Rysbekova A. B., Muxina J. M., Kazkeev D. T., Janbyrbaev E. A., Sartbaeva I. A., Garkusha S. V., Volkova S.A. Creation of predselektsionnyx resources for selection of Kazakh soleustoychivyx varieties of rice. Drawings № 3-4 (32-33) 2016. Pages 44-51.
[43] Shatalova M.V. Otsenka vertikalnolistnogo materiala pri selektsii na povyshenie produktivnosti risa. Scientific journal KubGAU, №133 (09), 2017. Doi: 10.21515 / 1990-4665-133-083

[44] Qalandarov B.I., Saydaxmedova M.E., Mallaev J.I., Khayitov M.Y. Collection of articles of the Republican scientific-practical conference UZSHITI "The role of samples of rice collection in the creation of varieties." Tashkent. 2011. Pages 13-16.
[45] Papulova E.Yu. Characteristics of the source material of rice in the creation of varieties with high content of protein and medium content of amylose in the grain. Scientific journal KubGAU, №70 (06), 2011. http://ej.kubagro.ru/2011/06/pdf/23.pdf
[46] FAO (2010) Land and plant nutrition management service,FAO, http://www.fao.org/ag/AGL/agll/prosoil/saline.htm