COTTON SCIENCE



Volume-2
Issue-1
DOI 10.5281/zenodo.6557199

Chief Editor
Zhōnghuá Mínguó
Editorial Team

Arthropod Management and Applied Ecology

Michael D. Toews
University of Georgia

Melissa W. Siebert
Agriculture Division of DowDuPont

Plant Pathology and Nematology

Kathy S. Lawrence
Auburn University

Paul P. "Trey" Price
LSU AgCenter

Breeding and Genetics

Jinfa Zhang
New Mexico State University

Steve Hague
Texas A&M University

Textile Technology

Noureddine Abidi
Texas Tech University

You-Lo Hsieh
University of California

Economics and Marketing

John Robinson
Texas A&M University

Weed Science

Tom Barber
Dept. of Crop, Soil & Env. Sciences

The multidisciplinary, refereed *Cotton Science* contains articles that improve our understanding of cotton science. Publications may be compilations of original research, syntheses, reviews, or notes on original research or new techniques or equipment. All manuscripts volunteered or invited, are submitted electronically and directed by the editor-in-chief to the appropriate associate editor for a double-blind peer review. The *Journal of Cotton Science* is published four times a year. Articles are available as Adobe PDF

Cotton Science International scientific journal

Founder and Publisher **Zhōnghuá Mínguó**
Published science may 2021 year. Issued Quarterly.
Internet address: http://journals.company
E-mail: info@journals.company

Cotton Science (2022)
Volume-2
Issue-1
DOI 10.5281/zenodo.6557199

INFLUENCE OF LEAF FEEDING ON RICE YIELD

Saitkhanova D.R., doctoral student (PhD) Rice Research Institute, Uzbekistan

Abstract: In this article, research was conducted to study the effect of leaf-feeding on rice plants. The advantages of rice cultivation when using micronutrients in leaf-feeding are determined. Experience shows that the yield was greater by 4-5 C/ ha, rice varieties “Lazurniy "and "Iskandar", the vegetation period was shorter by 10-11 days with leaf feeding.
Keywords: rice, variety, seedlings, seeds, Lazurniy, Iskandar

Introduction. Rice is the staple food of many peoples of the world. Almost half of humanity eats its grain. Rice groats in terms of color, ease of digestion and dietary properties occupies one of the first places among all types of cereals. In terms of calories, it is slightly inferior to wheat. Rice as a hygrophyte is of great agro-ameliorative importance, since with its help saline and waterlogged lands are brought into agricultural exploitation, on which other crops cannot be cultivated.

On the territory of the Republic of Uzbekistan, rice is mainly sown in the early and main periods dry on dry soil or pre-soaked seeds in water.

And as a repeated culture, at a later date, by the seedling method, and as a result, each of the sowing methods has its positive and negative sides. Rice growers will use each of their opportunities, to use one of the methods of rice cultivation.. It should be noted that of all the methods, the seedling method is the most economical, where there is a significant saving in seeds, fertilizers, herbicides and fuels, and lubricants.

Literature review. Rice is one of the most important agricultural crops. According to statistics, rice is the staple food for 50% of the world's population and makes up the majority of the calories received by 3.5 billion people worldwide. According to FAOSTAT data for 2012, rice ranks third in production among agricultural raw materials.[1] According to S. A. Kurbanov, high efficiency of fertilizers is ensured only when they are applied taking into account specific soil and climatic conditions, nutritional characteristics of individual crops and their alternation in crop rotation, agricultural technology, fertilizer properties, and many other factors.

The annual rate of fertilizer for individual crops can be applied at different times and in different ways. The timing and methods of applying fertilizers should provide the best conditions for plant nutrition throughout the growing season and the greatest payback of nutrients in the crop. There are three ways of applying fertilizers: before sowing (or main), with sowing (in rows, nests, holes) and post-sowing (or top dressing during the growing season) [2].

The biotechnology of waste processing based on active microbial associations makes it possible to obtain highly effective microbially transformed fertilizers in domestic practice, which have so far been successfully tested in the field and vegetative experiments. Their positive effect on soil properties, plant productivity has been proven, and their quality is significantly higher than when applying an equivalent dose of mineral fertilizers, liquid manure, chicken manure, etc. [3]

Place and methods of research. The experiments were carried out in 2018-2019 at the Experimental Base of the Uzbek Rice Research Institute. The soil of the experimental plot is meadow-swamp with a close occurrence of groundwater. The predecessor is soybean. Rice varieties “Lazurniy” and “Iskandar” were tested in the experiment. Phenological observations, biometric measurements, and statistical dispersion analysis of the research results were carried out in the studies. “Methods of the State variety testing of agricultural plants” (1985), “Methods of field experience” (Dospekhov B.A., 1985), “Methods of field research” (UzRICBSP, 2007) were used.

Research results. Seeds of rice varieties were sown in cassettes on April 28 and were planted in special greenhouses for growing seedlings. Before sowing rice seeds in a cassette, the

Volume-2
Issue-1
DOI 10.5281/zenodo.6557199
soil brought from the experimental field is sifted through a 2-3 mm sieve, thus clearing coarse mixtures. Then the sifted soil is mixed with rotted manure in a ratio of 1:5 and 30 g of the mineral fertilizer ammophos are placed in each cassette, then 170 g of seeds of the corresponding rice varieties are placed in each cassette. Top covered with soil with rotted manure 0.5 cm thick.

The soil is moistened, then poured with water with a layer of 1 cm. By the end of April, all these are covered with an ordinary film, which is opened during the day with the appearance of the sun. Seedlings appear on the 12-13th day, they are constantly under a layer of water. On day 25, they are fed with a nitrogen fertilizer at the rate of 5% of the annual feed fertilizer.

On the field prepared for seedlings, the soil is filled with water and adapted by mechanisms to these conditions. Thus, each is achieved by maintaining a layer of water at a level of 1-3 cm.

Table -1

Influence of micro fertilizers on standing density and on the number of productive stems

Options	**Method of sowing**	**Number of plants, pcs/m^2**		**Preservation of plants before harvesting, %**	**Tillering rate %**	**Number of productive stems, pcs/m^2**
		At sowing time	**Until harvest**			
Variety Lazurniy						
100% NPK	Manual transplanting	78	75	96,6	3,49	262
	Transplanting by machine	83	81	98,0	3,40	275
	Sowing by seed	279	162	57,9	1,80	291
75% NPK Crystalon	Manual transplanting	78	75	96,2	3,57	268
	Transplanting by machine	83	81	97,2	3,45	280
	Sowing by seed	280	164	58,5	1,82	297
75%NPK Logopuser	Manual transplanting	78	75	96,2	3,59	270
	Transplanting by machine	84	81	96,8	3,45	280
	Sowing by seed	281	162	57,7	1,84	298
Variety Iskandar						
100% NPK	Manual transplanting	78	75	95,7	3,46	259

Volume-2
Issue-1
DOI 10.5281/zenodo.6557199

	Transplanting by machine	83	81	97,6	3,33	269
	Sowing by seed	280	161	57,9	1,71	275
75% NPK Crystalon	Manual transplanting	78	75	96,2	3,52	264
	Transplanting by machine	82	81	98,4	3,38	274
	Sowing by seed	279	162	58,1	1,78	288
75%NPK Logopuser	Manual transplanting	77	75	97,0	3,54	265
	Transplanting by machine	83	81	97,6	3,42	277
	Sowing by seed	276	162	58,3	1,77	288

When the seedlings reach a size of 15-20 cm, they are transplanted onto the main field. Seedlings are planted with a special South Korean machine brand PF-455 according to the scheme of 30-12 cm, 3-4 seedlings in each hole. Manually, according to the scheme 20x20 cm hole 2-3 seedlings. Seed sowing was carried out at the rate of 200 kg seeds per hectare, previously soaked with water the day before sowing. Thus, planting rice was conducted in three ways: seedlings, mechanism, manually, and seeds on dry soil. All records and observations were made according to the general methods used. One of how yields appear is the density of plant standing and it mainly depends on the norm of seed material, their quality, and field germination. With the agrotechnics of rice by the seedling method, these abilities are preserved, but with this method, the main thing for increasing the yield is their tillering ability, and with their high coefficient, a high yield is noted. The yield of rice at a high standing density is determined by the amount of productivity of the stems, this indicator in the seedling method is one of the main indicators of the yield of rice. In agriculture, it is known that among cereals, the field germination of rice plants is lower than that of other cereals, but it is known that the tillering rate of rice plants is greater than that of other cereals. It is known that standing density significantly affects plant height and yield.

In our research, it was found that the safety of rice plants before harvesting depends on the productivity of the stems, the biological characteristics of the variety, and the influence of micronutrient fertilizers. It was revealed that when sowing by seeds or seedlings, the number of productive stems significantly affects the growth and development of rice plant yield.

However, in the studied varieties “Lazurniy” and “Iskandar”, the safety of plants in all options differ, for example, the preservation of seedlings was 92.7-96.0%, and when sown with seeds, this figure is 63.6-67.0%. The preservation of plants mainly depends on the methods of sowing (seedlings, seeds) and foliar feeding with micro-mineral fertilizers. In options 2-3 of the seedling method and foliar feeding, compared with the control option without top dressing, the preservation of plants was high.

Productivity tillering should be plentiful, ensuring the plasticity of the plant. In rice plants, the leaves are studied, divided into 3 tiers. The middle tier ensures the growth and development of the conical part and, on this basis, spikelets are formed on panicles. These leaves on plants influence the transition from vegetative to generative state. With the elimination of 5-6 leaves, rice

Volume-2
Issue-1
DOI 10.5281/zenodo.6557199
productivity decreased by 35%. The leaf surface of rice plants depends on the environmental conditions and also the method of sowing and foliar feeding. In the experiments, the influence of sowing methods and foliar feeding on the leaf surface of Iskandar and Lazurniy rice varieties was studied.

The highest values on the leaf surface were in the “Lazurniy” variety, in the variant 75% + Crystalon micro fertilizer.

Table -2

Influence of sowing methods and foliar feeding on the leaf surface of rice plants

Option	Method f sowing	Leaf surface of one plant, cm^2			
		Tillering	Bulging	Milky ripeness	Yield
Variety Lazurniy					
100% NPK	Manual transplanting	195,5	287,5	178,5	78,0
	Transplanting by machine	198,1	300	185,9	80,2
	Sowing by seed	197,6	311,8	193,9	75,6
75% NPK Crystalon	Manual transplanting	185,4	276,9	170,4	80,6
	Transplanting by machine	185,9	282,6	180,3	82,5
	Sowing by seed	188,8	291,5	192,7	78,8
75%NPK Logopuser	Manual transplanting	174,4	256,4	162,6	82,8
	Transplanting by machine	175,6	267,4	172,2	83,8
	Sowing by seed	179	277,6	182,9	79,9
	HCP_{05}				2,45 c/ha
	HCP				3,4%
Variety Iskandar					
100% NPK	Manual transplanting	193,9	286,3	177,9	84,5
	Transplanting by machine	195,8	298,7	183,2	87,2
	Sowing by seed	197,7	311,6	192,1	78,6
75% NPK Crystalon	Manual transplanting	182,6	276	167,1	88,0
	Transplanting by machine	184,9	283,7	176,8	90,2

Volume-2
Issue-1
DOI 10.5281/zenodo.6557199

	Sowing by seed	187,7	290	187,4	83,2
75%NPK Logopuser	Manual transplanting	171,7	253,6	161,1	88,3
	Transplanting by machine	173,6	266,5	171,7	92,3
	Sowing by seed	177,3	278	184,1	82,7
	HCP_{05}				2,63 c/ha
	HCP				3,5 %

In the tillering phase, the difference between the options of indicators on the leaf surface of the rice is small, and in the later stages of development it is significant, i.e. in the phase of milky ripeness, variety Iskandar 161.1-187.4 cm^2, variety Lazurniy 162.6-193.9 cm^2, in the heading phase of variety Iskandar 253.6-311.6 cm^2, variety Lazurniy - 256.4-311, 8 cm^2.

In the experiment, foliar feeding with complex micro fertilizers increased the yield of rice varieties. High additional yield compared to the control when using Kristallon from complex micro fertilizers 2.3-3.2 c/ha for the Lazurniy variety, 3.0-4.6 c/ha for the Iskandar variety, 3.6-4.8 c/ha ha in the Lazurniy variety, compared with the control when using Logopusher/ha, in the Iskandar variety, 3.8-5.1 centners/ha of grain increase was grown.

Sowing methods: manual and mechanical sowing of seedlings also have a positive effect on the yield, which in these methods is 3.7-4.6 c/ha more for the Lazurniy variety and 7.0-9.6 c/ha for the Iskandar variety, than in the control option.

CONCLUSIONS:

1. Revealed in the varieties "Lazurniy" and "Iskandar" with the seedling method, compared with sowing seeds on the treated soil, it ripens 9-11 days earlier, and with foliar feeding of the plant with micro fertilizer, compared to the control variant without top dressing, the crop ripened 2-3 days earlier.
2. It was noted that in the option with foliar feeding, compared with the control option, without top dressing, the height of the plants is 4-6 cm higher.
3. High yields of 82.5 and 90.2 centners/ha in the varieties "Iskandar" and "Lazurniy" in seedlings with a mechanism and top dressing 75% + Crystalon, and in options without the use of fertilizers, the yield was lower by 4-5 centners per hectare.

References

1. FAO statistics/ World food and agriculture. 2012
2. Kurbanov S., Magomedova D. Seeding rates and productivity of rice varieties. Ştiinţa agricolă, № 1/2010. pp.25-27
3. Binom. Knowledge Lab 2009.
4. Methods of field research (UzRICBSP, 2007).
5 Dospekhov B.A. "Methodology of field experience" Moscow "Kolos" 1985, pp. 350-423