Volume-2 | Issue-4 Available online @
https://procedia.online/index.php/philosophy

Procedia
of Philosophical and Pedagogical Sciences

Advantages of Agrotechnical Measures in Obtaining Abundant Rice Harvest in Regular Rice Fields

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Abstract. This article describes in detail the physico-chemical changes of the soil, mechanical composition, humus and nutrients, and the effect of agrotechnical measures used to increase the rice yield in the experimental area where rice is grown. the article is proved on a scientific basis and the conclusion is given at the end of the article.

Keywords: rice, soil, climate, consistency, seed, fertility, fertilizer, yield, rate, term, water, technology, plain, effect.

INTRODUCTION: In the current conditions, planting period and planting speed are important agrotechnical processes in the cultivation of agricultural crops. Ultimately, the fate of the harvested crop largely depends on these factors. Since the beginning of rice cultivation, it has been cultivated in all countries of the world with strict adherence to the planting period and standards. One of the important factors that determine the final result from rice (yield, gross yield and net income) is the rate of planting per unit area and the thickness of the plant in that area. Planting standards are determined based on the morphobiological characteristics of each variety. One of the urgent tasks is to determine the indicated norm, i.e., the amount of planting, and to develop measures aimed at increasing productivity in rice cultivation using intensive agrotechnics on a scientific basis.

Unfortunately, the quality of the soil in rice fields in our Republic is deteriorating every year. The main purpose of human use of the earth is to obtain the necessary products. The problems of growing agricultural crops are solved by different processing methods. Mechanical tillage of soil leads to loss of its biota, reduction of organic matter content, deterioration of soil composition and erosion. As a result, the soil loses its "health" and becomes infertile, and this process has a bad effect on the amount of the future harvest.

(www.sgp.uz Earth energy biodiversity).

In the world, scientific researches are being carried out in a number of priority directions for

further development of rice cultivation, preservation of soil fertility and effective use of water resources, optimization of the ecological situation, assessment of water-physical, technological, agrochemical properties and land reclamation. In this regard, special attention is paid to the selection of rice varieties suitable for soil-climatic conditions, the development of agrotechnical measures for cultivation, the improvement, restoration and increase of soil fertility in the fields of continuous rice cultivation, and the wide use of scientific and practical achievements [6;7].

Extensive reforms on the development of agriculture have been implemented in our republic in recent years. In particular, according to the decision of the President of the Republic of Uzbekistan dated February 2, 2021 "On measures to further develop rice cultivation" No. PQ-4973, improvement of the continuous and effective system of rice cultivation, storage, processing, stable supply of rice products to the domestic consumer market and export specific tasks have been set for increasing the capacity, strengthening scientific research work in this regard, and wide application of water-saving technologies in rice cultivation [1].

In recent years, due to the global climate change observed in the world, due to natural disasters occurring in many large rice-growing countries, the production volume of rice products has decreased, and the demand for it in the world market is increasing.

Therefore, the constant increase in the prices of food products all over the world and the decrease in the level of quality make it necessary to strengthen the selection, seed production and seed science, agrotechnics and plant protection in rice cultivation, to further increase the volume of food production in the republic, to increase their types, to increase the population's nutritional demands to meet the demand for food products more fully, to increase the export potential.

Stable provision of food needs of the population of the republic, filling the domestic consumer market with rice products produced in our country, reducing the volume of imports and increasing the export potential is one of the priority tasks in the development of agricultural potential.

The degree of salinity of the 4.2 million hectares of total arable land in our republic is increasing and today it is about 65%, of which about 15% are highly saline areas. There is no negative significance of highly saline lands for rice cultivation, rice cultivation is very helpful in improving land reclamation, therefore, rice planting is being organized in highly saline areas of all regions of our Republic and newly developed areas.

There are opportunities to increase the export potential of our country by fully satisfying the needs of the people of our country for this product and by expanding the rice cultivation areas.

Planting of rice in our country, mainly in the Republic of Karakalpakstan, Khorezm, Tashkent, Andijan, Namangan, Fergana, Syrdarya and Surkhondarya regions, on an area of about 130 thousand hectares, introducing advanced agrotechnical measures to obtain abundant and high-quality crops expansion of the areas of varieties, introduction of water and resource-saving technologies in rice cultivation is required. It is known that the productivity can be increased by 35-40% due to the high yield and seed quality and yield.

Today, the rice grown in our country cannot fully cover the rice requirements of the people of our republic. Because in terms of per capita rice cultivation, our republic lags far behind

many countries. For example, in the Asian countries specializing in rice cultivation (Japan, Korea, China, India, etc.), while more than 100 kg of rice per capita is grown, this indicator does not even reach 10 kg in our country. Therefore, the main task facing the science and practice of rice farming is to dramatically increase the yield of rice and the amount of gross product by any means.

Consistent reforms in the agrarian sector serve to develop the grain industry in our country, increase the production of grain products, and increase the productivity of the land.

LITERATURE ANALYSIS AND METHODOLOGY.

In order to ensure food security in a number of developed rice-growing countries in the world, due to the creation, selection, rational placement and use of advanced resource-saving technologies of cultivation, in order to ensure food security, high productivity and economic efficiency are achieved by improving grain quality. One of the most important agrotechnical measures in the cultivation of a high yield of rice is the exact determination of the planting date and seed rate.

In scientific research conducted by N.V. Vorobev on the methods of planting rice seeds, the germination rates of 1.5-2.0 cm of seeds are sown, 70% of the seeds germinate in the first week, and 17-23% of the rest in 12 days. [3]

Yu.K. Goncharova found out in her scientific research that rice plants form different seedling thicknesses at different planting rates. When the planting rate is increased, the number of seedlings per unit of area will be more, in the option with a low planting rate, it will be more per plant, depending on the level of crowding. Photosynthesis net productivity per plant was higher in the low-planting option. The development of crop structures, the length of the furrow, the completeness of the grain were determined in the variants with a high sowing rate, and the yield was 10-12 centner more. [3]

When determining the planting rate, it is determined based on the weight of 1000 grains. If the weight of 1000 grains in rice grain is high, the quality indicators in the seed composition are also high. Nutritiousness and quality of cereals made from grain will be high. Therefore, the importance of planting dates for full ripening of grain [5].

The planting rate is determined by the optimal amount of plant growth per hectare, and it depends on the number of seedlings saved, productive stems and the degree of crowding. Breeding biopreparations also promote moderate germination of rice seeds [4].

It is important to determine the planting rate and period correctly, so that the morpho-biological development of the plant is moderate, the plant reveals all its potential and the yield is the highest. From long-term laboratory and practical observations, it was found that the changes in planting dates had an effect on the vegetation period and productivity of the plant [2].

In rice, when the number of seedlings is increased, the restriction of tillering will allow the plant to speed up the lateral fertilization. Thinning of the plant causes a shortage of rice grains, which drastically reduces productivity. But even if the lawns grow sparsely due to the low planting rate, it is extremely important to feed the plants at high rates, that is, 4 mln. it is possible to get the desired yield even by planting seeds per hectare [2].

B.I. Qalandarov, in the scientific research carried out in the experimental fields of the Rice

Research Institute, it was found that the rate of planting rice seeds affects the formation of the leaf surface by 45-65%, the accumulation of dry mass of one plant by 53-62%, the plant height by 21-30%, the rate of nitrogen fertilizers and 21-40, 30-39 and 68-88% influence on the formation of leaf surface, dry mass of one plant and plant height, respectively, and glassiness ($r_{Guljahon}$ = 0,78; r_{Ilgor} = 0,86; r_{Tarona} = 0,85) between positive, vitreousness with the norm of nitrogen fertilizers ($r_{Guljahon}$ = -0.57; r_{Ilgor} = -0.49; r_{Tarona} = -0.51), rice yield ($r_{Guljahon}$ = -0.68; r_{Ilgor} = -0.68; r_{Tarona} = -0.68), negative among whole rice yield (rGuljahon = -0.72; r_{Ilgor} = -0.65; r_{Tarona} = -0.63), husk yield ($r_{Guljahon}$ = 0.63; r_{Ilgor} = 0.72; r_{Tarona} = 0.63) it was found that there is a positive correlation between.

Methodological basis of the research: Conducting field experiments and phenological observations are carried out according to UzPITI methods (1981, 2007), that is, "Methodological guidelines for conducting field experiments" (2007). The vitreousness of rice is determined according to GOST 10987-76, the amount of rice output and the amount of whole rice output according to GOST ISO 6646-2013. Estimation of leaf area of rice plant Vishnu M. Bhan and H.K. Pande (IRRI) method, Agrochemical analyzes in soil and plants. "Методы агрохимических и микробиологических исследований в поливных районах", Tashkent, (1963), "Методы агрохимических анализов почв и растений Средней Азии" (1977) and the biological activity of soils to D.G. Zvyagintsev's "Methods of soil microbiology and biochemistry" (1980) is carried out according to economic indicators were calculated in the method of V.N. Polojyi, mathematical static analysis of the obtained results was calculated in the dispersion method in the " Методика полевого опыта" manual of B.A. Dospehov (1985) and in the Microsoft Excel program.

During field research:

- to determine the influence of external factors (weather, light, heat) on the field fertility of rice seeds and seedling thickness of different planting periods and standards;
- to study the effect of planting periods and standards on the growth periods of rice varieties and the development of productive stems;
- to study the effect of different planting periods and standards on the change of the leaf surface and the net photosynthetic productivity of the rice plant;
- to determine the effect of different planting periods and standards on the accumulation of above-ground dry mass of rice varieties; to determine the effect of different planting periods and rates on rice crop structure, yield and technological quality indicators of rice.

The following chemical analyzes were performed under laboratory conditions:

- Humus - by the method of I. V. Tyurin.
- Total amount of nitrogen, phosphorus and potassium in one sample by Mesheryakov's method
- The mechanical composition of the soil by the method of N.A. Kachinsky with the help of a hexamethophosphate dispersant

Stationary - field observation works.

The main tasks of field experiments are to provide a comparative scientific, agrotechnical and economic evaluation of new methods or crop care technologies being studied for

introduction to production in different natural and economic conditions using the results of laboratory, vegetation, lysimeter, and small field research.

The following observation methods are widely used in plant science.

1. Laboratory
2. Vegetative
3. Lysimetric
4. Field experiments

Through these monitoring methods, agricultural plants are monitored, data are collected and recommendations are made based on the data for precisely monitored farmers and clusters.

In accordance with the level and state of climate changes occurring now, placing rice varieties based on the soil and climate conditions of each region, improving the complex of effective agrotechnologies that improve rice productivity and its quality, using biofertilizers and biopreparations that feed the plant from the leaves without growing rice using only mineral fertilizers. it is necessary to develop agro-measures that improve their physico-chemical properties.

It is necessary to find effective agrotechnical methods of cultivation in order to obtain a high stable grain yield from the rice crop and to increase the economic efficiency of rice cultivation. With the creation of new productive varieties, there is a need to develop elements of agrotechnical measures for them, including norms for planting seeds.

In the research institute of rice cultivation, scientific and research work is being carried out on agrotechnics of cultivation of newly created early, medium and late ripening rice varieties in many years of field experiments, the effective influence of planting periods and seed standards on rice grain yield and technical and quality indicators of rice has been proven. With the use of new intensive technologies in rice fields, accelerating the germination of seeds, treating seeds with biopreparations in order to create a full lawn, it increases the root system, increases the growth and development of the plant, improves the nutrition of the plant with nitrogen, phosphorus and potassium elements, increases their resistance to phytopathogens, as a result, the flowering phase of the plant increases, which increases the productivity and quality of the product, allows to get the product much earlier, and increases its shelf life.

The scientific researches carried out by breeder scientists of the Research Institute of Rice Cultivation to determine the planting dates of new rice varieties, the norms of feeding with seeds and mineral fertilizers are being continued continuously until now.

The research was conducted in the following options.

1. - Option without fertilizer (control).
2. - Fertilizing at the rate of 30 tons per hectare once in two years (fertilized in 2021).
3. - Application of mineral fertilizers from N150 R120 K150 kg per hectare every year.
4. - Planting a cover crop every fall and plowing for fertilizer.

5. - Planting an intermediate crop once in two years and reaping the blue mass.

Plant height and dry mass accumulation in regular rice cultivation. (Average 3 years).

Table 1.

Variant	Plant height by phase, cm			Dry mass by phase, g.		
	germination	sprouting	fertilization	germination	sprouting	fertilization
1	16,8	37,8	98,7	0,077	1,9	4,5
2	19,3	42,4	115,8	0,097	2,18	4,9
3	19,6	43,7	118,4	0,098	2,48	5,7
4	19,9	43,9	119,8	0,107	2,49	5,9
5	18,5	41,5	116,3	0,11	2,3	5,6

The results of observation and accounting during the years of research showed that the aggregate composition of the soil in the control option (80%) was almost the same in all options, except for the option where 30 tons of manure was applied per hectare in 2 years, and it was 84%.

In the years of research, the volume weight of the soil in the control option was 1.47 g/cm3, and in the remaining options, it remained at the level of 1.27-1.29 g/cm3 due to the applied agrotechnical measures. Among the weeds characteristic of rice field, the number of khilal seeds (3639 pieces), tuganagi (33 pieces), and kurmak seeds is 3640 pieces, which is 4-5% more than the last option, by 4-5% compared to options 2-4. The main reason for this is the destruction of weed seeds by cultivation and cultivation before planting. Such regularity was also observed in the amounts of khilal nodules and kurmak seeds.

No drastic changes were observed in the amount of macroelements and humus in the soil. At the beginning of the study, the total nitrogen content of the experimental fields was 0.20%, phosphorus 0.24%, and potassium 0.44%, while at the end of the study, nitrogen was 0.19%, phosphorus 0.24%, and potassium 0.42%. The amount of humus was 1.6% in the control variant, and 1.7-1.8% in the remaining variants (except for the manure variant). The germination of rice was not affected by the quality index levels of soil fertility and aggregate content. In 1m² the number of sprouts collected over the years in all options was 260-290 pieces.

In all years of the study, the height of the plant in the control variant was 5-8 cm lower in the bud phase, 10-14 cm in the fruiting phase and 16-19 cm in the full ripening period. Differences in plant dry mass accumulation were also mainly observed in the tillering phase. One plant accumulated 1.9 g in the control option, 4.5 g in the fertilization phase, and 1.4 g more in the option with 30 tons of manure and the recommended amount of mineral fertilizer per hectare.

This pattern was also observed in the later stages of plant development. As a result, these indicators were also reflected in the productivity level of the plant. That is, in the control option, the level of productivity obtained from one hectare in the research years was 32-34.9 tons. It was found that in the options where agrotechnical measures were used, it was at the level of 49-53.9 ts. This means that the yield is 20-25% lower than the yield in the fields where the crop rotation system is introduced.

The following factors can be added to the advantages of using new bioagro-technology in

areas where rice is grown regularly: reduction of consumption of mineral and organic fertilizers by 25-50%; reduce the amount of water used for irrigation by almost 2 times; improving the balance of the soil microbial community at the expense of beneficial microorganisms; increase soil fertility; normalization of alkaline pH of saline soils; improvement of soil nutrient balance and plant nutrition; reduction of damage by diseases; decreasing the level of phosphorus and salinity; it is possible to reduce soil contamination with mycotoxins and organochlorine pesticides. It will be possible to supply ecologically clean rice products to the population.

CONCLUSION. According to the obtained results, it is possible to say that in order to increase the soil fertility of rice-growing areas, it is necessary to plant intermediate and siderate crops and apply agrotechnical measures in time, process rice seeds with bopreparats and feed the plant from the leaves. . It is important to create the ground for a high yield of rice. In turn, getting a good harvest from rice is necessary to meet the needs of the population for rice products.

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