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The Influence of Agro-Technical Measures on Productivity of Rice Plants (Uzbekistan)

Urazmetov Kh.K.

***Abstract*— This article describes the influences of planting in different time of the late-ripening rice on the productivity of rice plants. "Mustakillik" and "Tarona" varieties of rice were experimented and the yields were 95.5 cwt/ha and 97.8 cwt/ha[1] respectively**

***Index Terms*— Mustakillik, Tarona, Rice .**

I. INTRODUCTION

The increase in the world population and the growing demand for food in developing countries lead to the growing cost of agricultural products. According to the Head of the Advisory Group on International Agricultural Research Frank Rijsberman, the demand for food products will grow over coming years. It should be noted that an increase in rice product reserves depends on the region's agricultural crops. It is estimated that in some Asian countries, including India and Thailand, the volume of world rice production is expected to decline by 1% in 2016 compared with 2015 due to the ongoing droughts. For 2015-2016 years, the world rice trade volume was 368 million tons. This was less for 2.6 million tons in comparison with 2014-215. At the same time, the increase in the consumption of rice leads to a 12% reduction in rice reserves of exporters and this causes a reduction of one-third of the reserves of exporters.

The only solution to the problem is to examine new ways to get higher harvest of agricultural land. Therefore, the reform of the agricultural sector, modern, green technologies have become one of the most important challenges facing all countries. Working out agro-technical measures for late-ripening rice varieties taking into account soil and climatic conditions of Uzbekistan plays a significant role in solving issues related to rice production and meeting people's demand for rice products.

Planting time for late-ripening rice is very important factor. Because, during vegetation (development) period, rice crop gains micro elements (nutrition) and temperature required.

Different planting time and providing various norms of nutrition for late-ripening rice were experimented and used agro-technical measures to achieve high yields.

According to the results, providing higher nutrition for "Mustakillik" variety of late-ripening rice led to an increase in the accumulation of rice grains. In terms of figures, 90 kg, 120kg and 150 kg of N (Nitrogen) were experimented and it increased average 2-5, 3-7, and 3-10 days respectively. These measures have influenced starting and ending of graining level of rice. The difference in starting of rice graining was 8-11 days compared to control variety. Although there was not significant difference in starting of graining, however, at the ending point, there was huge difference in graining. This was 6 days in first year of the experiment. Moreover, for "Tarona" variety, starting and ending time of graining was extended due to more usage of fertilizers. Under usage of 150 N kg/ha, this indicator was 9 days longer than control variety.

In all planting period without nitrogen, rice productivity was between 30.2 cwt/ha and 35.2 cwt/ha. This shows that role of nitrogen in rice vegetation and development is significant. Lack of nitrogen influences rice growth adversely. For "Mustakillik" and "Tarona " late-ripening rice varieties, planning time is second half of April or first half of May. If planting time is after that period, this causes rice growth. If rice is planted in second half of April, it will ripe within 128-137 days and if rice is planted in first half of May, it will ripe 126-134 days.

For "Mustakillik" and "Tarona" late- ripening rice varieties, total temperature should be 2900-3080 ^{O}C. This depends on air temperature. Because, in early seasons, day time lasts 12-13 hours, whereas, it increases in summer period. When comparing productivity on rice varieties, early planted rice with high norms of N (120- 150 kg/ha) gave more yields than late planted rice with the same N usage.

This condition was also observed in the period of starting time of ripening and fully ripening of the rice. Ripening period started late for 3 days in the condition of giving 90 N kg/ha compared to control variety. This was 5-7 days and 7-8 days in the condition of 90 N kg/ha and 120 N kg/ha respectively. Also, using N for late-ripening rice varieties leads to an increase in the vegetation period for 9-15 days. An increase in vegetation period comes from using more N which leads to a higher accumulation coefficient compared to control variety, having extra stems, and ripening rice from those stems.

According to the experiments, feeding rice with more N causes to fall down of rice in the field. For example, there was a possibility of falling down to 2 points for "Mustakillik " and "Tarona" varietys when using 150 N kg/ha. The following figure was based on experiment results which included "Mustakillik" and "Tarona" late-ripening varietys. These varietys were planted on 25 April, on 5 May and on 15 May using 90 N kg/ha, 120 N kg/ha and 150 N kg/ha (Figure 1).

Urazmetov Kh.K., Tashkent State Agrarian University (TSAU), researcher

[1] cwt- hundredweight (a unit of weight equal to 100 kilograms)

Time of planting	Rate of fertilization , kg/ha	Mustakillik variety	Tarona variety
25-Apr	Standart	33,1	34,1
	$P_{120}K_{150}$ – Fon	48,9	50,9
	N_{90} + Fon	54,2	58,2
	N_{120} + Fon	67,2	68,8
	N_{150} + Fon	89,3	91,3
05-May	Standart	33,6	35,2
	$P_{120}K_{150}$ – Fon	51,4	59,4
	N_{90} + Fon	58,7	70,4
	N_{120} + Fon	80,3	83,5
	N_{150} + Fon	95,5	97,8
15-May	Standart	30,2	31,3
	$P_{120}K_{150}$ – Fon	45,2	45,6
	N_{90} + Fon	52,9	51,8
	N_{120} + Fon	64,1	62,3
	N_{150} + Fon	80,6	84,8
LSD test P≤05		***1,7***	***1,7***
%		***0,5***	***0,5***

Figure 1- The influence of planting time and fertilizer usage on productivity of late-ripening rice varieties.

"Mustakillik" rice variety planted on 5 May and used 150 N kg/ha gave the highest productivity (95.5 cwt/ha). This was 2.8 times higher in comparison with control variety. In this case, using more N leads to graining with higher quality of rice seeds (grains). Also, in "Tarona" case planted on 5 May, 97.8 cwt/ha yield was taken. Simultaneously, the more N was used, the more yields were achieved.

For 2013-2015 field experiments, the following conclusion can be drawn upon

- For "Mustakillik" and "Tarona" late-ripenng rice variety planted on 25 April, 278 and 279 rice seedings sprouted out and it was 234 and 224 before harvesting respectively.
- Late-ripening rice varietys "Mustakkilik" and "Tarona" planted on 5 May under 150 N kg/ha gave 95.5 cwt/ha and 97.8 cwt/ha yield respectively.
- Seedings of "Mustakillik" and "Tarona" were 2.8 times higher than control variety.

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