ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Innovative Development Of Rice Industry.

Tatyana Nikolaevna Polutina*, and Pavel Valeryevich Mikhailushkin.

Kuban State Agrarian University named after I.T. Trubilin, Kalinina St., 13, Krasnodar 350044, Russia.

ABSTRACT

The purpose of the study is to estimate rice industry current development and perspectives for the industry innovative development. The study involves diagrammatic and computational research approaches. Main hypothesis is determination of rice industry development type (decreasing or increasing costs industry) and assessment of innovations implementation for increase of rice production with costs decreasing. The study deals with rice industry development in Krasnodar Territory. Rice industry is considered an increasing costs industry in accordance with microeconomic theory. The authors conclude that organizational-economic mechanism appears to be ineffective. It is shown that, at the current stage of the industry development attention must be paid to innovations implementation. Main innovations offered by Russian Rice Research Institute are considered in the study. State support is required for implementation of innovative technologies and industry development.

Keywords: innovations, rice, Krasnodar Territory, decreasing and increasing costs industries, state support.

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Russian rice industry has been actively developing mostly by virtue of Krasnodar Territory. Rice is not only the most demanded grain in Russia, but also a high-yielding grain. For the last ten years gross output of rice has increased by more than 400 thous. tonnes and yield by 27 q/ha. Over the last years rice yield in Krasnodar Territory constantly exceeds 60 q/ha which is 20 q/ha more than worldwide average figures. The Russian Federation annually exports about 200 thous. tonnes of rice with main supply volume from Krasnodar Territory.

Rice irrigation system square estimates 234.5 thous. ha in Krasnodar Territory. About 100 farms of eight municipal units deal with rice production in Krasnodar Territory.

Rice cultivated areas in Krasnodar Territory occupy 122 thous. ha, with yield 73,2 q/ha in 2017. Gross output in bunker weight estimated 893 thous. tonnes.

Table1: Key figures of rice production in Krasnodar Territory

Indicator	Year							
	2010	2011	2012	2013	2014	2015	2016	2017
Cultivated areas, thous.ha	133,1	135,0	133,3	126,3	130,8	134,3	136,2	122,0
Yield, q/ha	68,3	69,9	71,1	64,4	71,4	70,4	75,2	73,2
Gross output, thous. tonnes	908,9	939,8	947,8	813,1	930,0	945,3	1024,8	893,0

Reduction of cultivated areas is determined by infestation of rice with millet weed and weed rice varieties which dramatically reduce sowing productivity.

In order to solve this problem grounding for saturation of rice rotation with main crop is offered. Within current economic situation optimal amount of rice in crop rotation for the next few years must be at least 60% depending on households' specialization and meliorative condition of used areas.

The amount of funding for repairing work of state meliorative facilities such as tubes, pipelines, hydro technical facilities and pump stations is not enough.

Households have to deal with a challenging problem of irrigation systems. Due to heavy expenses households cannot carry our repair and refurbishment work sufficiently.

In addition Krasnodar rice producers directly depend on water resources and watering for rice cultivation. For this reason many irrigation difficulties emerge during low water years and as the result producers have to save each cubic meter of water.

State support of rice producers for conveying and drainage water expenses compensation for rice sowing was for the first time allocated in Krasnodar Territory.

MATERIAL AND METHODS

Growth in production increases demand and price for factors of production used in production process what results in increase of expenses and price.

Price increase for resources with growth in production results in marginal and average costs increase. Volume of production increases until average costs become equal to price.

Innovative development is the only way which helps to increase volume of production while decreasing marginal and average costs.

ISSN: 0975-8585

There are two types of industries in microeconomics [1-3], they are *increasing cost industry* and *decreasing cost industry* characterized by the process when increase in production exceeds price rate for production.

The correlation assessment of increase in production and production price can be applied for assessment of industries development including rice production.

RESULTS AND DISCUSSION

The assessment was conducted basing on rate of increase to reference period 2010 (diagram 1)

Rice industry was a decreasing cost industry before 2012. Key factors of rice production increase were industry technological development and adoption of innovative technologies.

Since 2013 when rice price rate increased its production volume, adoption of innovative technologies and organizational-economic mechanism can be considered ineffective.

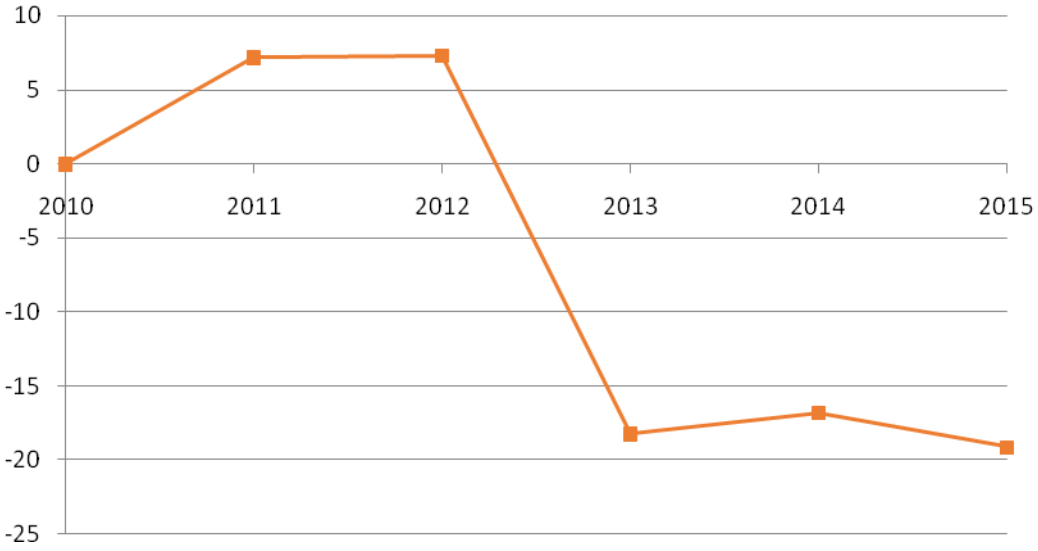

Figure 1: Difference between rice production increase and selling price in Krasnodar Territory comparing to 2010

Intensification of competition in rice industry between large companies will result in small and medium-sized households shutdown what will promote further decrease of expenses.

In order to rice industry became a decreasing cost industry large households need to produce most of production volume.

State regulation interacts increasing and decreasing cost industries differently. Rice industry requires support which not only compensates the difference between expenses increase with production increase, but completely changes the industry development, primarily supporting adoption of innovative technologies.

Russian Rice Research Institute deals with development and implementation of innovative technologies. Its main research results are presented in table 2.

ISSN: 0975-8585

Table 2: Innovative technologies developed by Russian Rice Research Institute

Innovative activities of Russian Rice Research Institute					
Development of high yielding rice, vegetables, and melons varieties: - plant varieties for intensive technologies with improved grains; - resistant to difficult environment plants; - plants of functional type; - plant varieties for energy saving technologies.	*Development of methods of gene complex fixation which determine heterotic effect:* - study of different genetic systems' contribution to productivity of rice samples (*foreign and domestic varieties*); - molecular marking of rice varieties with evenly distributed genetic SSR molecular markers; -production of dihaploids from pollen of heterotic hybrids selected in past years; - hybridization of Russian and foreign rice varieties; - development of plant varieties of japonica subspecies adapted to Russian environment.	*Development of rice cultivation techniques*: - high-yielding adaptive-landscape systems of agriculture; - theoretical basis and methods of fertility increase of rice soils; - highly effective patterns of crop rotation and soil technologies using multifunctional, energy and resource saving technologies; - application of organic micro and macro fertilizers, chemical meliorants, growth regulators and other agrichemicals.	*Agricultural engineering and certification of rice varieties:* - determination of optimal seeding rate, seeding time and techniques, amount of mineral fertilizers for new varieties basing on previous results; -carrying out of ecological and industrial tests of rice varieties in agricultural landscapes of Krasnodar Territory; -impact study of azot fertilizers amount and period of use for new rice varieties; - rice seed multiplication provided for state strain test and approved for processing; - study of rice varieties response to previous plants.	*New technologies and application of fertilizers and other agrochemical agents:* - application of organic and mineral fertilizers using chemical ameliorants, nitrification inhibitors and other agrichemicals corresponding to environmental requirements; - method of calculation of mineral fertilizers doses for rice planned yield; -quick diagnostics technique of rice plants azotization by chlorophyll amount in leaves using N-tester.	*Experimental verification of standarded operation procedures:* -phytopathological assessment of 150 rice varieties; -morphobiological description and assessment of agronomic characters of 150 samples; - DNA certification of 30 rice varieties basing on SSR multiplex analysis; - genotyping of 100 varieties with biotechnology methods: DNA marking and PCR for the presence of Pk, Pi-9, Waxy, qLTG3-1genes.

ISSN: 0975-8585

CONCLUSION

1. The assessment of rice production development in Krasnodar Territory shows that despite of increase of yield, rice export and gross output rice industry continues to be an increasing cost industry.

2. Rice industry requires state support which not only compensates the difference between expenses increase with production increase, but completely changes the industry development, primarily supporting adoption of innovative technologies.

3. Russian Rice Research Institute offers a number of innovative solutions implementation of which can improve industry development.

REFERENCES

[1] Haiman D. N. Current microeconomics: analysis and appliance. Translated from English. – printed in Moscow: Finance and statistics, 1992. – 384 p.

[2] Pindaik R., Rubinfeld D. Microeconomics: Translated from English / Scientific editors: V.T. Borisobich, V.M. Polterobich, V.I. Danilov and others – printed in Moscow: Economics, 1992.– 510 p.

[3] Hitter C. Economics of sectors and enterprises: Translated from English. –printed in Moscow: Finance and statistics, 2004. – 480 p.

[4] Research work report of Russian Rice Research Institute in 2017 - Krasnodar.-2018.– 26 p.