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Discussion and Reflection on the Strategy of Rice Production Capacity Improvement in Jiangsu

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ABSTRACT

The rice industry in Jiangsu is of great significance to ensure the food security of Jiangsu Province, as rice is the largest food crop in Jiangsu Province and plays a key role in maintaining national food security and promoting the stable development of the national economy. With the increasing number of people and the rapid development of the economy, the demand for the quantity and quality of food is growing, and ensuring food supply has become the primary goal of agriculture at present and for a long time to come. Due to the limited cultivated land resources, Jiangsu Province is facing great pressure and challenges in improving rice production capacity, and it is particularly urgent to accelerate the green and high-quality development of Jiangsu's rice industry, increase yield and yield, and achieve a balanced increase in yield.

KEYWORDS

Rice; Capacity; Jiangsu; Tactics

1. INTRODUCTION

As an important grain production base in China, the improvement of rice production capacity in Jiangsu Province is of great significance to ensure national food security and promote high-quality agricultural development. Jiangsu Province has made some progress in key technologies for rice cultivation, such as the promotion of new varieties of high-quality rice and the use of efficient agricultural machinery. The government has introduced a number of policies to support agricultural development, including special agricultural transfer payments and rice subsidies. In addition, Jiangsu Province plans to invest more than 34 billion yuan during the 14th Five-Year Plan period to transform and upgrade high-standard farmland. The investment of these policies and funds will provide solid support for the improvement of rice production capacity. At present, it is necessary to further integrate the rice industry chain, form a closed-loop management from seed breeding, planting, harvesting to processing and sales, and enhance the competitiveness of the entire industrial chain. At the same time, strengthen brand building and enhance the market awareness and consumer trust of Jiangsu rice products.

2. ORGANIZATION OF THE TEXT

2.1. Quantitative Evaluation and Current Situation Analysis Of Rice Industry Production Capacity In Jiangsu

2.1.1. Rice planting area and distribution at the present stage

Jiangsu is one of the 13 major grain-producing provinces in China, and it is also one of the main rice-producing and high-yielding provinces in China. From 2011 to 2015, the rice planting area in Jiangsu

Province accounted for about 7.5% of the national rice planting area, ranking fourth in the country, and occupying an extremely important position in the national rice production.

The topography of Jiangsu Province is dominated by plains, and the climate belongs to the subtropical humid monsoon climate, with abundant rainfall and suitable temperature, which is very suitable for rice growth. Therefore, rice is widely distributed throughout the province, especially in the areas along the Yangtze River and the North Jiangsu Plain. In addition, with the advancement of agricultural technology, such as the application of water-saving irrigation and integrated pest management, rice production can be carried out in areas that are not suitable for rice cultivation.

Rice cultivation in Jiangsu Province is characterized by a variety of varieties, and Jiangsu Province has popularized a variety of rice varieties that adapt to local climate and soil conditions, including early-maturing, medium-maturing and late-maturing varieties. Secondly, the technology is advanced, and modern agricultural technologies such as the integration of water and fertilizer, and biological control of diseases and pests are widely used, which have improved the yield and quality of rice. In addition, it pays more attention to ecological balance and sustainable development, promotes green prevention and control and organic planting, and reduces the use of chemical fertilizers and pesticides. Finally, it has formed a complete industrial chain from seed breeding, planting management to harvesting and processing, which has improved the added value of the rice industry.

In the past 30 years, there have been obvious regional differences in rice planting area in Jiangsu Province, with a rapid decrease in southern Jiangsu, a slight decrease in central Jiangsu, and a rapid increase in northern Jiangsu. This change reflects the impact of industrialization and urbanization on the regional pattern of rice production. In recent years, the total rice yield in Jiangsu has increased by 2.9 times, and the large increase in yield is the main driving factor for the increase in the total yield. Especially in northern Jiangsu, the increase in rice yield is greater than that in southern Jiangsu, and variety improvement and cultivation technology innovation are the main reasons for the increase in yield. In addition, japonica rice production in Jiangsu Province has significant comparative advantages in scale and comprehensive comparative advantages, but does not have comparative advantages in efficiency.

2.1.2. The demand for rice yield and quality increased

With the development of the economy and the improvement of people's living standards, the market demand for rice has not only increased in quantity, but also has higher requirements in quality. At present, the demand for high-quality rice in the market is gradually increasing, especially for organic rice, green pollution-free rice and other special rice. Challenges and opportunities coexist for the rice industry in Jiangsu. On the one hand, it is necessary to further improve the quality of rice to meet consumers' pursuit of health and nutrition. On the other hand, it can expand the share of Jiangsu rice in the domestic and foreign markets through brand building, marketing and other means.

The quality evaluation of rice involves many aspects, including appearance quality, taste quality, nutritional quality, etc. In Jiangsu, as consumers pay more attention to healthy diets, the demand for rice quality is also increasing. In order to meet the market demand, we should pay attention to the selection and breeding of new rice varieties with glossy appearance, excellent taste and high nutritional value, promote standardized rice planting technology, ensure the safety and traceability of the rice production process, establish and improve the rice quality monitoring system, and carry out strict inspection from seed selection to final product delivery.

2.1.3. Rice production technology and equipment

Affected by the transfer of rural labor force to cities, farming farmers are aging, the ability to accept new technologies is not high, coupled with the lack of agricultural technicians in towns and villages, it is difficult to comprehensively promote high-yield supporting technologies to thousands of households, and excellent rice varieties and excellent cultivation methods must be combined to play a huge role in China's rice production and food security. The premise of realizing the combination of

improved varieties and good methods is that farmers must be able to accurately recognize the rice varieties they grow, so as to promote rice production. In recent years, Jiangsu Province has implemented the mechanization of the whole process of cultivation, management and harvesting, and rice production has been carried out in strict accordance with green production standards, and unified varieties, unified sowing, unified control, unified fertilization, unified water management, and unified harvesting have been implemented. The research on agricultural machinery and equipment for the whole process of mechanization of rice production in Jiangsu Province shows that the premise of realizing the whole process of mechanization of crop production is to analyze the quantity of agricultural machinery and equipment required in each link of crops. Jiangsu Province has also made remarkable progress in the mechanization of rice planting, forming a pattern of simultaneous development of three technical modes of mechanical seedling throwing, direct seeding and transplanting, especially the machine transplanting technology, which is favored because of its advantages in increasing yield. However, although some breakthroughs have been made in mechanized planting methods such as mechanical transplanting and mechanical direct seeding, there are still some problems, such as the large amount of labor in the seedling raising process and the immaturity of operating equipment.

The application status of rice production technology and equipment in Jiangsu Province shows that the province has achieved certain results in improving rice yield and efficiency. However, in order to achieve a higher level of development, it is also necessary to continuously strengthen technological innovation, optimize equipment allocation, improve farmers' skills, increase policy support, and strengthen cooperation and exchanges at home and abroad. Through these measures, we can further improve the scientific and technological content and modernization level of rice production in Jiangsu Province, and make greater contributions to ensuring national food security.

2.2. Analysis of Key Factors Affecting the Improvement of Rice Production Capacity in Jiangsu

2.2.1. Climatic factors

In terms of temperature, the average temperature, maximum temperature and minimum temperature all showed an upward trend during the whole growth period of rice in Jiangsu Province, and the growth rate of the minimum temperature was higher than that of the maximum temperature, and the growth trend in southern Jiangsu was higher than that in northern Jiangsu. This upward trend in temperature has a positive impact on rice yields, as rice growth and development are smoother in the right temperature range. However, excessive temperature can lead to the occurrence of heat damage in rice, such as high temperature stress can inhibit the synthesis of organic matter in crops, affecting the growth and development and yield of rice. In terms of radiation variation, the total solar radiation in northern Jiangsu showed an age-by-decade decreasing trend, which was not conducive to the photosynthesis of one-crop rice. However, in southern Jiangsu, the change trend of radiation is not obvious, and the impact on rice is relatively small.

Although the trend of precipitation was not significant, in some studies it was found that there was a negative correlation between precipitation and rice yield, that is, an increase in precipitation could lead to a decrease in rice yield. This may be because too much precipitation can cause soil moisture to be too high, which is not conducive to the respiration of rice roots, thus affecting yields.

The impact of climate change on rice productivity in Jiangsu Province is complex and multifaceted. On the one hand, the rise of temperature and the change of radiation have a certain effect on the growth and development of rice. On the other hand, the increase of high temperature and heat damage, the uncertainty of precipitation, and the change of future water demand all pose challenges to rice productivity.

2.2.2. Varieties and Technologies

Through the innovation and effective popularization and application of crop cultivation technology, the yield of rice can be greatly increased under the premise of appropriately reducing productive inputs. For example, "seedling strengthening, row expansion, seedling reduction, fertilizer adjustment, and water control" are the key technologies for high yield. In addition, improving the uniformity of panicle number and grain number per hole is an effective way to coordinate the contradiction between panicle number, grain number per panicle and grain weight.

Variety improvement is one of the main reasons for increasing rice yield. There was a significant positive correlation between the overall yield level of japonica rice and plant height, whole growth period and seed setting rate in Jiangsu, indicating that the quality could be improved on the basis of maintaining the existing yield level and balancing the relationship between appearance and palatability by breeding new varieties with high yield and high efficiency.

The applicability of chemical nitrogen fertilizer reduction optimization in rice production has been verified, and rice yield and efficiency can be increased by regulating operation and increasing organic fertilizer. The implementation of precision fertilization technology for rice can not only significantly reduce the amount of nitrogen fertilizer, but also effectively improve rice yield.

2.2.3. Policy and market

As a major japonica rice producing province in southern China, it is of great significance to promote the high-quality layout of rice to improve the high-quality development of agriculture. It is necessary to speed up the breeding of green and high-quality food varieties, accelerate the approval and promotion of high-quality varieties, and scientifically optimize the application layout of varieties to improve the competitiveness of Jiangsu's rice industry. At the same time, adjusting the internal planting structure of grain, such as replacing relatively low-yield crops with relatively high-yield crops, is an important factor in promoting the continuous increase of grain production. This adjustment will help to achieve a sustained and steady increase in food production. In recent years, Jiangsu's rice production has achieved a substantial increase in yield by increasing input, popularizing and applying new varieties and new technologies, thus entering a new stage of optimizing the structure and improving efficiency. According to the ecological suitability and resource endowment of different regions of Jiangsu Province, targeted development strategies for rice advantageous areas were formulated to improve the overall production efficiency and market competitiveness.

2.3. Strategies and Measures to Improve Rice Production Capacity in Jiangsu

2.3.1. Driven by scientific and technological innovation

In China, rice planting and production has formed a perfect independent development system, rice planting refinement and intelligent management has made great progress, but are for rice local and single links have made in-depth research, such as the management of rice planting information in the regional environment, rice pests and diseases and control, rice expert system, rice knowledge base, rice germination, rice cultivation technology, rice growth environment monitoring, remote diagnosis and other aspects of research, Most of them adopt traditional management methods and extensive management methods, and the management methods are relatively extensive and the management level is relatively low [2].

In terms of the application of biotechnology to rice breeding, Jiangsu Province is undergoing a transformation from traditional selection to modern molecular breeding technology. The development of biological breeding technology has gone through the stages of primitive domestication breeding, hybrid breeding, molecular breeding, etc., and is currently developing in the direction of intelligent molecular design breeding (version 4.0). In addition, the establishment of the Japonica Rice Industry Technology Center of the National Key Laboratory of Rice Biological Breeding (Wuxi) marks an

important step in the field of rice biological breeding in Jiangsu Province. The center will focus on solving technical problems in the rice industry and promoting the development of the rice industry.

In terms of the application of intelligent technology to rice planting management, Jiangsu Province is improving the level of agricultural mechanization and intelligence through the integration of intelligent subsystems such as electronically controlled tillage depth adjustment, field soft and hard perception and electronically controlled automatic balancing, as well as status monitoring Internet of Things technologies. The application of these technologies can help improve agricultural production efficiency and crop yields while reducing labor costs and resource waste. For example, the Xishan Yanjiaqiao Agricultural Machinery Professional Cooperative has applied these intelligent systems to the cultivation management and harvesting machines.

2.3.2. Optimize the planting structure

As a large agricultural province, Jiangsu Province attaches great importance to the rational planning of rice planting. As a basic and strategic core industry of the country, Jiangsu will continue to promote the development of modern seed industry during the "14th Five-Year Plan" period. Through research, Jiangsu believes that rice with good taste meets the needs of production and development, and organizes tasting meetings to screen out varieties that are suitable for planting in the province and recognized by consumers. For example, Nanjing 46 is highly regarded for its excellent taste quality and opened the prelude to the production of excellent taste rice in Jiangsu.

In terms of variety selection, Jiangsu Province actively promotes rice varieties suitable for local planting conditions. At present, the main varieties promoted include conventional japonica rice, hybrid indica rice and hybrid japonica rice, among which Nanjing series varieties have become the leading varieties of conventional japonica rice in Jiangsu Province due to their high yield and high quality. In addition, according to the climatic conditions and soil characteristics of different regions, Jiangsu has also cultivated and promoted a variety of excellent japonica rice varieties with strong adaptability, such as Nanjing 5718 is suitable for planting in the hilly areas of central Jiangsu and Ningzhen, while Nanjing 66 is suitable for planting in Huaibei area.

Jiangsu Province implements the strategy of "storing grain on the ground and storing grain in technology", and implements grain-oil rotation, grain-bean rotation, rice-oil rotation and other models, which not only promote agricultural efficiency and farmers' income, but also promote the high-quality development of Jiangsu's planting industry. Through the innovative application of technical models, such as the annual high-yield, high-efficiency, accurate and quantitative cultivation of rice and wheat, and the green and efficient comprehensive planting of vegetables, Jiangsu Province has continuously improved agricultural production efficiency and environmental sustainability. We will build advantageous areas for rice production and form advantageous industrial belts. We should give full play to the comparative advantages of agricultural regions, adjust the positioning of regional functions and the main direction of attack, and focus on building advantageous areas of japonica rice and indica rice, so as to form advantageous industrial belts. In the north of the Huaihe River, the dominant area of medium-ripening and medium-sized japonica rice in Huaibei was established; Establish the dominant area of late maturing medium japonica rice between the Huaihe River and the Yangtze River. Establish a single-season late japonica rice dominant area along the Yangtze River and Taihu Lake in southern Jiangsu; In the areas along Luoma Lake, along the canal and in the southwestern hills, the dominant area of hybrid medium indica rice along the canal and the hills was established.

2.3.3. Improve resource efficiency

Combined with the economic level, geographical conditions and other factors of Jiangsu Province, the development trend of water-saving irrigation technology is analyzed and predicted, so as to better adapt to and promote technological progress. In accordance with the standards of field moisture status in paddy fields in the "Irrigation Test Specification", the water depth and soil moisture content should be reasonably controlled to achieve the purpose of saving water and improving crop growth efficiency.

Promotion and application of water-saving irrigation technology. Jiangsu Province has strengthened the construction of farmland water conservancy facilities by formulating targeted subsidies and water-saving incentives to ensure the increase of crop yield and efficiency. The government has issued relevant notices to encourage the vigorous promotion of water-saving irrigation technologies and promote water-saving agricultural work. Through the construction of high-standard farmland, the cost of agricultural irrigation can be effectively reduced, the yield per unit area can be increased, and the agricultural land output rate, resource utilization rate and labor productivity will be comprehensively improved.

Rational use of fertilizers and pesticides: Implement precise fertilization, adjust the type and amount of fertilizer applied according to crop demand and soil test results, avoid excessive fertilization, and reduce environmental pollution. A combination of organic and inorganic fertilizers is used to improve soil fertility and crop health. Implement integrated pest management (IPM) to scientifically prevent and control pests and diseases, and reduce the amount of pesticides. Choose pesticides with high efficiency, low toxicity and low residue, strictly control the dosage to prevent overapplication. Actively promote the application of high-efficiency, low-toxicity, low-residue, pollution-free, environment-friendly pesticides, strictly control the dosage of chemical pesticides, and avoid pollution of the ecological environment caused by non-standard drug use. The combined application of biological fertilizer machine can promote the accumulation of available nutrients in the soil of water-saving irrigated paddy field, and has a significant effect on the improvement of soil available phosphorus and available potassium content. Different from traditional chemical fertilizers, bio-organic fertilizers are rich in organic matter, humus, and active microorganisms, which can promote the accumulation of soil nutrients. The application of bio-organic fertilizer not only directly increased organic matter to the soil, but also promoted the improvement of soil organic matter content by improving soil aeration, enhancing soil microbial activity, and enhancing soil carbon sequestration capacity [4]. It can balance the fertilizer efficiency of chemical fertilizers, activate nutrients such as nitrogen, phosphorus, and potassium fixed in the soil, promote the absorption and utilization of nutrients by crops, and thus improve crop yield [5].

3. SUMMARY

To improve rice production capacity in Jiangsu, it is necessary to comprehensively use a variety of strategies and technologies, including but not limited to chemical nitrogen fertilizer reduction and organic fertilizer increase, promotion and application of precision fertilization technology, optimization and control of the quality of high-yield groups, promotion and application of high-quality rice varieties, scientific and technological innovation and popularization and application, stabilization of planting area and improvement of yield, balanced yield increase, agricultural structure adjustment and industrialization development, mechanization development, and comprehensive consideration of input factors and influencing factors. Through the implementation of these strategies, we can effectively improve the rice production capacity of Jiangsu and promote the high-quality development of agriculture. Through the implementation of a series of scientific and technological innovation and industrial upgrading measures, we can not only improve the yield and quality of rice, but also promote the sustainable development of Jiangsu's rice industry and contribute more to the local economy.

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