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Development of High Yield Rice Cultivation Industry in Technological Innovation

Yong Dai

Dalian Maritime University, Dalian, China

daiyong@dlmu.edu.cn

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Abstract: Rice is one of the three major grains. Improving rice output is extremely important to protect China's grain security. In order to ensure food security, various rice-related cultivation techniques, hybridization techniques and transgenic technologies have been continuously developed, developed and applied. In order to understand the current status of the development of high-yield rice technology in detail, it is indispensable to carry out research on the technological innovation and development of the high-yield rice cultivation industry. The purpose of this article is to solve the problem of how to increase the high yield of rice, by studying the current research status and development status of various rice high-yield cultivation techniques, especially about hybrid rice technology. In addition, the basic theory of two-line hybrid rice breeding and super hybrid rice breeding theory in hybrid rice technology are introduced in detail, and then the research of high-yield rice cultivation industry in the development of technological innovation is discussed through the experimental method. The research results show that the rice high-yield cultivation industry has been in a state of continuous development and progress in terms of technological innovation, especially the hybrid rice technology has always been in the international leading and evolving position, this technology can effectively increase rice output by about 21.5%, and breeding The cost is much lower than about 20% of ordinary rice. In addition, the genetically modified rice technology is also constantly being developed and improved.

1. Introduction

In terms of rice cultivation technology, China also has its own characteristics and advantages, especially the achievements of high-yield cultivation are more prominent [1]. In the past 50 years, the cultivation theories and technologies that have an important influence on the development of rice production in China include: reasonable dynamic structure of rice population; theory of rice development characteristics, and "small, strong, high" cultivation methods. There are also rice leaf age models, "sparse, few, and flat" high-yield cultivation methods, etc [2]. In addition, the theory

and technology of source-sink cultivation of rice varieties, the cultivation of rice population quality and the precise quantitative cultivation technology of rice have also made rapid development. And in the field of rice nutrient management, water-saving irrigation technology, etc. are also constantly developing [3]. The current and future research and development trends of rice cultivation theory and technology include the coordinated formation mechanism of high-quality and high-yield rice and its control technology, rice super-high-yield theory and technology, light and simplified rice cultivation technology, crop resistance and disaster reduction cultivation theory and technology and high-tech Application etc. These cultivation theories and technical research results contribute to the popularization of mechanical transplanting rice technology and the achievement of high yield [4].

There are still 800 million people in the world threatened by hunger, 36 countries are facing severe food shortages, and millions of people die of famine every year [5]. Due to the importance of rice production for human development, relevant measures have been taken to further strengthen the global emphasis on rice production, strive to improve rice production, promote the sustainable development of rice production systems, and obtain as much as possible of this important food through scientific and technological forces Crop to reduce hunger and poverty, at the same time, we must deal with the relationship between rice production and environmental friendliness, and create a better life for present and future generations [6]. China is the world's largest agricultural country and the world's most populous country. Its population accounts for more than 21% of the world's total population, while available arable land accounts for only 10% of the world's population [7]. Since 1964, hybrid rice research, with the joint efforts of the hybrid rice research team represented by Yuan Long ping, has experienced a development process of "from three lines, two lines to super rice", increasing the average rice yield by more than 20%, It has solved China's long-term food shortage problem, effectively eased the contradiction between people and land, and made a huge contribution to China's food security [8].

This article studies the development of high-yield rice cultivation in technological innovation. Among them, Z gave a detailed introduction to the current development and research status of rice high-yield cultivation technology, analyzed the existing problems in achieving high rice yield, and elaborated related research methods and solutions [9]. In his article, Jie proposed the research significance and current status of rice high-yield cultivation techniques, and explained the basic principles of commonly used high-yield cultivation techniques and hybrid rice techniques, and analyzed the problems of these technical methods, especially in terms of cost reduction. In addition, it shows the significance and importance of studying the high-yield rice cultivation industry in the development of technological innovation, and has made solutions to improvement and problems [10]. A.K. elaborated in details the basic principles and development status of transgenic and hybridization technologies, and their application in agricultural cultivation, especially in rice cultivation and other fields, and it can greatly improve rice yield and improve rice quality [11]. Xiao pointed out that the rice high-yield cultivation industry has been in constant development and progress in terms of technological innovation, especially hybrid rice technology has always been in the international leading and continuously developing position [12].

In short, this article discusses the research status of rice high-yield cultivation industry in the development of technological innovation as the main research content. Specifically, the main research content of this article is roughly divided into five parts: The first part is the introduction part, which aims to make a systematic review of the main research content of this article from the research background, research purpose and research ideas and methods; the second part is The theoretical basis, a detailed and systematic summary of the current research status of various cultivation techniques used in the rice high-yield cultivation industry. The third part is related research. Through querying data and conducting relevant experiments, it elaborated the advantages and disadvantages of related techniques to improve rice high yield, especially hybrid rice

technology. The fourth part is the analysis of the data. Through the specific survey data and research results, the feasibility and superiority of hybrid rice technology and related cultivation techniques are verified from the aspects of rice yield per plant, total yield and breeding cost. Part V It is the summary and suggestion part of this article; it is the summary of the achievements of the article and the prospect of further improvement.

2. Proposed Method

2.1. Basic Theory of Technological Innovation for High-Yield Rice Cultivation Industry

Rice high-yield cultivation technology is one of the common agricultural technologies, and its development and innovation are closely related to the innovation of overall agricultural technology. There are many existing theories in the development process, such as Marx's technology development theory. Marx is the first economist to recognize technological innovation as an important driving force for economic development and competitiveness. In his works such as "Poverty in Philosophy", "Criticism of Political Economy", "Application of Machines, Natural Forces and Science", Marx made an incisive discussion on the issues of technology and science, technology and economy, technology and society. Marx's foresight not only laid a solid foundation for Marxist economics, but also profoundly affected many economists. Schumpeter was initially inspired by Marx's core role of technological progress in the long-term economic growth and the continuity and evolution of technological progress, such as technological innovation and innovative destruction. In "Capital", Marx repeatedly emphasized that technology as a material means is a prerequisite for modern production. In the modern production economic process, "now capital does not require workers to work with hand tools, but workers need to work with a machine that can manipulate the tools themselves. Therefore, large industries must incorporate huge natural forces and natural sciences into the production process. Improving labor productivity is clear at a glance." This means that technology is a variety of material means that people master in the labor process. Science is transformed into productivity through technology, and labor productivity contains "scientific power", technology it is an intermediary or bridge between scientific application and production. It is further pointed out: "The production process becomes the application of science, and science in turn becomes a factor of the production process, the so-called function." Obviously, in Marx's view, science belongs to the category of productivity, but science can only be transformed into productivity through technology. Marx's substantive explanation of technology fully reveals the social purpose of technology. Through the study of modern industrial revolution, Marx further explained the promotion effect of scientific and technological progress on the development of productive forces. He pointed out: "Labor productivity is determined by a variety of circumstances, including: 'The average proficiency of workers, the level of scientific development and its application in craftsmanship, the social integration of the production process, the scale and efficiency of means of production, and Natural conditions". Among these many factors, whether it is the improvement of workers' proficiency, the expansion of the scale of production materials and the improvement of efficiency, the development and utilization of natural conditions are inseparable from the development of natural science and technology. The social integration of the production process is closely related to the development of social science and social technology. Science and technology are the basic driving force for the development of productive forces. The founder of Marxism not only deeply analyzed the decisive role of modern science and technology in the development of economy or productive forces, but also fully affirmed the historical law that the production and development of science and technology are determined by social and economic development. They believe that "the occurrence and development of science is determined by production at the beginning.

There is also Schumpeter's innovation theory, which defines "innovation" as "establishing a production function" and introducing a "new combination" of production factors and production conditions that has never been introduced into the production system. This "new combination" includes the following: (1) the introduction of new products; (2) the adoption of new methods; (3) the opening of new markets; (4) the seizure or control of new sources of supply of raw materials or semi-finished products; (5) A new organization for industry. The "new combination" that Schumpeter refers to includes both technological innovation and institutional innovation, but technology-related innovation, that is, the "new combination" is the main content of Schumpeter's "innovation". When studying the process of capitalist economic growth, Schumpeter believes that the source of capitalist economic growth is not capital and labor, but technological innovation. "Different methods of use (innovation) instead of an increase in savings and available labor. In the past, He has changed the face of the economic world in 50 years. He believes that "innovation is an internal factor, and economic development is also a change in economic life from the internal creativity of his own", and he has imaged the innovation process of constantly reforming the economic structure from within. Known as "industry mutation", it is believed that economic development is the process of continuous "new combination" and "generation of mutation" in the entire economy and society. Schumpeter introduced the concept of "innovation" to try to explain economic development from a mechanism. Schumpeter distinguishes " "Growth" and "development". Invention is the discovery of new tools or methods, and innovation is the application of new tools or methods: scientific research, technological invention and innovation are strictly separated, and innovation follows the linear model of knowledge production and application. Invention first, then innovation: the enterprise is the only place to realize innovation, "as long as the invention has not been actually applied, then the economy is ineffective." This understanding highlights the central aspect of the commercial application of technology or inventions, which is beneficial to overcome the tendency of technological inventions to stay out of economic activities. However, because of the absolute distinction between inventions and innovations, they often make both the complicated and interactive connection between them is simplified. In this understanding, although technology or invention is regarded as the source of innovation, it is regarded as an external factor of innovation. In other words, innovation is endogenous, technology or Inventions are exogenous, especially science. This new model is summarized as Schumpeter's model of technological innovation.

2.2. Composition of Technological Innovation Ability of High-Yield Rice Cultivation Industry

From the meaning of industrial technological innovation, the formation and improvement of industrial technological innovation capabilities are realized in the continuous cycle of new technologies and new processes from the generation, application, and industrialization. Result. Therefore, for the evaluation of agricultural bio-industry technological innovation capability, this article focuses on the entire process of industrial technological innovation capability formation, grasps the overall industrial technological innovation through process research, and takes into account the high investment, high knowledge, and high policy of agricultural bio-industry technological innovation Influence and other characteristics, from the following aspects to build an evaluation index system of agricultural bio-industry technological innovation: First, the resource allocation capacity of industrial technological innovation. It refers to the basic ability of the industry for technological innovation. Overall, the number, frequency and level of technological innovation activities undertaken by the industry are the concrete manifestations of the technological innovation capability of the entire industry, while the number, frequency and level of technological innovation activities are determined by the level of scientific and technological resources it possesses.

Therefore, it is the most basic influencing factor of industrial technological innovation. This part is mainly to measure the technological innovation potential of the evaluated objects, that is, the allocation of resources in the process of technological innovation activities. This allocation includes aspects such as manpower, technology and capital. The second is research and development capabilities. Mainly refers to the overall level of research and development in the process of industrial technological innovation.

It not only represents the actual level that an industry's technological innovation capability has reached, but also affects the industry's future technological innovation capability. It is the most direct influencing factor and the most critical link in industrial technological innovation. The third is the transformation output capacity of technological innovation. It not only reflects the result of the transformation of scientific research achievements, but also is the industrial economic foundation supporting technological innovation. The economic support of an industry can not only affect the behavior of all participants in innovation activities, but also have an obvious role in promoting or restricting the formation and development of the industry's innovation awareness and innovation culture. Therefore, there is a clear positive correlation between the support of industrial economy and technological innovation. This part reflects the direct or indirect results of the actual output of technological innovation in agricultural bio-industry in terms of innovation output. The fourth is the innovation policy support. It refers to the ability of innovation policies and systems to support industrial technological innovation. Because agricultural bio-industry technological innovation is very sensitive to the policy environment, it directly affects the enthusiasm of the innovation subject and the process of innovation. The practice of technological innovation at home and abroad has proved that the innovation policy environment has a strong role in promoting or restricting technological innovation capabilities, and there is a clear correlation between the two. It should be noted that some policies have a certain restrictive effect on innovation, but considering that its effect has been reflected in the field of resource allocation, research and development, and industrialization, in order to avoid excessive measurement, this article will support innovation Effect inspection.

3. Experiments

3.1. Experimental Materials and Locations

In order to explore the feasibility and adaptability of the current high-yielding cultivation techniques created and continuously developed, a rice plantation site in Wen Zhou City was selected for related experiments. At present, the cultivation technology of late rice production has a very important position in rice production and even grain production in Wen Zhou City. However, there are still two major problems in the production of late rice in the city: First, the benefit is low. According to the survey of the grain-growth association of Ping Yang County for seven consecutive years, the average late rice acre benefit is 141.1 Yuan, far lower than other agricultural leading industries All kinds of crops. The second is that the yield is not high. In recent years, due to the severe weather, it has occurred frequently. Due to the low rate of planting technology in place, which restricts the development of high-yield potential of varieties, the yield of late rice stays at about 420kg, which is still a certain gap from the average yield of the province.

The experimental cultivar was Feng Liang you 1 (two-line hybrid rice). The experiment set up 6 treatments of 3, 4, 5, 6, 7 and 8 leaves, with an area of 20 m2 per plot, repeated three times and arranged completely randomly. The experiment was uniformly sown on June 15, semi-arid seedling raising, the seeding amount was 9kg / HMZ, the seed before sowing was soaked with 500 times the effect liquid for 5 hours, and a special fertilizer for rice was applied per HLMZ seedling field (NPK content is 12-5-7) 600kg is used as a base fertilizer, and the transplanting period is based on the

occurrence date of the main stem of the seedling reaching the leaf age required by the experiment. Total fertilization in the field: pure N18Okg per HMZ, PZo545kg, K2090kgN fertilizers were used as basal surface fertilizer, separate fertilizer (7d after planting, the same below) and Bao Hua fertilizer (applied when two leaves are exposed, the same below). The ratio is 50:35:15; P fertilizer is used as basal surface fertilizer at one time; K fertilizer is used as basal surface fertilizer and flower-keeping fertilizer, the ratio is 3: 1. The planting specification is 26.7cmx23.3rm, single insert, and the basic seedling is 160,500 MZ. Moisture management: waterless irrigation is used after greening, a thin water layer is established at the heading stage, and dry and wet alternate in the later period, mainly wet. The test treatments matured on October 14-19. The full birth period is 121-126 days. After harvesting and drying, the production is calculated, and 1.0kg sample valley is taken for each treatment, and sent to the Rice and Product Quality Supervision, Inspection and Testing Center (Hangzhou) of the Ministry of Agriculture for testing.

3.2. Experimental Method

In order to explore the feasibility of high-yield cultivation techniques, relevant experimental groups and control groups were set up. The experimental group was conducted in Wu jail wen Responsibility Field, Wu haiku Village, Yi Shan Town, Can Nan County. The former field was a free field. A total of five treatments were set up in the experiment, with 75,000 bushes and 165,000 bushes planted per hectare. 210,000 clusters, 255,000 clusters, each area of 20m2, repeated three times, arranged completely randomly. The tested variety is Fenagling No.1. The experiment was sown on June 15th with a seeding volume of 105 kg. Before sowing, the seeds were soaked with 0.2% dimethoate solution. The semi-arid seedlings were raised. The transplanting period was July 2 and the transplanting leaf age was 4.6 leaves. The total fertilization amount in the test field was pure NZSOM 36kg / HMZ, phosphate fertilizer was used as the base fertilizer, and potassium fertilizer as the split fertilizer; the application rate of nitrogen fertilizer was base fertilizer: divided sunflower fertilizer: mulberry fertilizer was 6: 2: 2. Water management is in accordance with the requirements of the rice intensified cultivation system, that is, shallow water transplanting, moist irrigation in the mulberry-divided period, and alternation of wet and dry after the booting period. The prevention and control of diseases and insect pests are the same as conventional cultivation of high-yield fields.

In addition, a relevant control group was set up. The experimental site was in Xian ping Village, Xian ju Township, Cannon County. The former farm was a free field, and next to the test field was a duck farm. According to the determination of barium in the Environmental and Product Quality Testing Center of Wen Zhou Academy of Agricultural Sciences, the soil PH value was 5.73, organic matter was 2.88%, available nitrogen was 154PPm, available phosphorus was 6.7ppm, and available potassium was 90ppm. The tested variety was Feng Liang you No.1, which was sown on June 13 and transplanted on June 30, and the dense planting was 26x27cm. In the vegetative growth period of water management, the waterless humid irrigation method is used. The water sensitive periods such as the young ear differentiation period and the heading period are appropriately increased the number of irrigation's, and the thin water layer is established intermittently. Information, and do a good job in preventing and controlling diseases and insect pests. The experiment of different dosages of nitrogen fertilizer set the total dosage of pure nitrogen as 120kg, 180kg, 240kg, 300kg and blank (non-fertilizing area) 6 treatments, the total dosage of PZOS was 45kg. The fertilizer application method is divided into three times, and the application ratio is the same in each period of each treatment, that is, base fertilizer: nitrogen fertilizer accounts for 60% of the total fertilizer, phosphate fertilizer accounts for 100% of the total fertilizer, and potassium fertilizer accounts for 80% of the total fertilizer: transplanting In the second 7-10 days, the millet fertilizer: nitrogen fertilizer accounts for 20% of the total fertilizer; the spike fertilizer when the

three leaves are exposed: the nitrogen fertilizer accounts for 20% of the total fertilizer, and the potassium fertilizer accounts for 20% of the total fertilizer. Each treatment cell area is 0.0013HM2, repeated three times. The total amount of fertilizers tested by different application methods of nitrogen fertilizer: decomposed organic fertilizer 15000kg monthly In12 as the base fertilizer, the total amount of pure nitrogen fertilizer 240kg per month, the total amount of PZOS 45kg. In addition, set the base fertilizer: split fertilizer: ear fertilizer ratio as 10: 0: 0, 7: 3: 0, 6: 2: 2, 5: 2: 3 and 7: 0: 3, etc. 5 treatments, each treatment Three repetitions, completely random block arrangement, with a cell area of 0.00135hmZ.

3.3. Experimental Results and Influencing Factors

The results of this experiment showed that among the six treatments with rice leaves of 3, 4, 5, 6, 7 and 8 leaves in the planting base, the transplanting yield was the highest when the seedlings were 4 leaves, the average yield was 10374k and the HMZ was higher than the yield. The lowest 8-leaf treatment increased production by 1029kg / hm2, an increase of 11.0%. The results of analysis of variance showed that there was no significant difference in yield between the four treatments of 3-6 leaves, but they were significantly higher than those of the eight-leaf treatment. There was no significant difference in yield between the seven-leaf treatment and each treatment. Proteins in rice transplanted by different leaf ages there is no obvious trend of the effect, and the treatment with four leaves and five leaves is higher. Therefore, transplanting with smaller leaf age is conducive to improving the cooking and eating quality of rice. Practice has shown that transplanting seedlings around 4.0 leaves can not only make full use of low-node mulberry to form large spikes, but also lay the foundation for high yield; The operability of farmers when transplanting seedlings, while improving the quality of rice. Among the high-yield technologies, rice yield and related traits are shown in Table 1:

Table 1. Information about rice yield and related traits

Planting pattern	Setting percentage	Thousand seed weight	Yield
High yield cultivation of late rice	93.2	29.4	9045.6
	93.1	29.8	10230.3
	93.32	30.5	11201.2

Different transplanting densities have a greater impact on rice growth and decline dynamics and yield. With the popularization of super rice varieties, the individual advantages of rice plants have gradually become obvious. Through sparse planting, the nutritional area of rice individuals can be increased and the growth and development of individuals can be promoted. In the experiment in Cannon County (the variety is Fenagling No.1, the former was blank), as the planting density per unit area decreased, the ability of individual plants to split millet was significantly strengthened, and the effective diversity time was prolonged. For example, the number of millets per plant in 75,000 bushes / mu increased faster than other treatments, and the highest number of cuts reached 37.8 / bush compared to 210,000 bushes / mu and 255,000 bushes / mu, an increase of 74.5% and 110.9%, respectively; The effective termination period of millet is July 26, which is 6 days and 9 days later than the treatment of 210,000 bushes / mu and 255,000 bushes / mu, respectively.

4. Discussion

4.1. Development and Feasibility Analysis of Common Rice High-yield Cultivation Techniques

High-yield rice cultivation techniques have an inestimable effect on the cultivation of rice. It can

not only improve the yield and quality of rice, but also help increase economic income, promote national development, maintain social stability, and improve people's living standards. The main points of traditional high-yield rice cultivation techniques are several aspects. Before planting rice, you must choose a good seedling field. This is the basis for planting rice. Only a good seedling field can provide a basis for the high yield of rice. The following points should be noted when selecting seedling fields: first, the selected seedling field should have better water storage capacity and a good irrigation system, which is convenient for reasonable irrigation; second, the selected seedling field cannot be a saline land, and cannot have Weeds; finally, the selected field must have good fertility. Before planting rice, we must screen the seeds and try to choose high-yield, high-quality, healthy, and strong stress-resistant seeds. For specific, we can choose local high-quality, high-yield products based on the characteristics of the region. Stable production varieties, these varieties have been identified by professional departments, with high use value. The selected seeds should be treated, sun-dried and disinfected to ensure that the selected seeds are healthy and free from virus contamination. The drying of the seeds is generally about 2 days. The drying can make the seeds more breathable and absorb water, and increase the germination rate. Seed soaking and disinfection can effectively prevent the occurrence of diseases such as bastard disease and bacterial leaf blight. Common high-yield cultivation techniques increase or decrease the annual average increase and decrease of rice area, yield and total output at different stages in China, as shown in Table 2.

Table 2. The average annual increase and decrease of rice area, yield per unit area and total yield in different stages were affected by the common high-yield cultivation techniques

Period	Years	Area	Yield	Production
1990-2000	10	4.86	13.6	40.62
2000-2010	10	14.63	112.3	422.6
2010-2018	8	32.12	62	431.6

In the process of rice planting, seedling rising is very important, and the quality of seedling rising directly affects the growth and harvest of rice. Seedlings are also called seedlings. Before the rice is sown, a field should be selected to cultivate the seedlings. After the rice seeds are sprinkled, in order to make the seedlings grow stronger, usually the seedlings are also selected. And the quality of seedlings depends on the strong seedling agent, so choosing a good seedling agent is the key to cultivate strong seedlings. In the selection of seedling strengthening agent, it must be selected by the relevant departments, to ensure the effect of seedling strengthening agent, and form healthy and strong seedlings. When choosing a strong seedling agent, we can choose Widia rice strong seedling agent. This product is at the leading level in China, which can achieve the maximum use effect and cultivate strong seedlings. When using strong seedlings, the dosage must be accurate, and it should be used according to scientific and reasonable methods. The impact of the developed scientific breeding methods and traditional breeding methods on increasing rice yield in common high-yield cultivation techniques is shown in Figure 1 below.

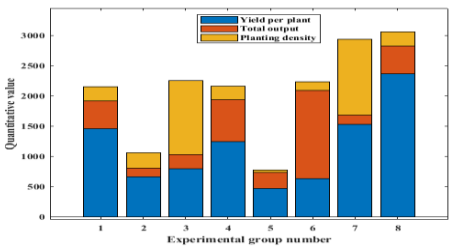

Figure 1. Effects of scientific breeding methods and traditional breeding methods on improving rice yield after development

From the data in Figure 1, it can be seen that the scientific breeding methods and traditional breeding methods developed in common high-yield cultivation techniques have a great influence on increasing rice yield, which can effectively increase the yield of rice per plant by 12% and the total yield of about 19.32%.

Fertilization also has a great influence on the yield of rice. The traditional fertilization method is inefficient, and the fertilization method changes greatly with the development of high-yield cultivation techniques. Among them, the growth of crops is inseparable from nutrients, which is what we call fertility and fertilizer. Fertilizer is the food of crops and is the foundation and key to its growth. In the process of planting rice, if we want to increase the yield of rice, we must carry out scientific fertilization, rationally distribute various nutrients according to a certain ratio, and make them nutritionally balanced, on the premise of ensuring reasonable dosage and science Next, the yield and quality of rice are improved, thereby creating the highest economic value and economic benefits. In rice planting, fertilization is divided into base fertilizer and top dressing. Whether we are applying base fertilizer or top dressing, we must choose scientific and efficient fertilizers and fertilize according to the different characteristics of rice at different times to ensure that the paddy field has enough fertility to meet the growth of rice seedlings. The influence of the developed scientific fertilization method and the traditional fertilization method on increasing rice yield in common high-yield cultivation techniques is shown in Figure 2 below.

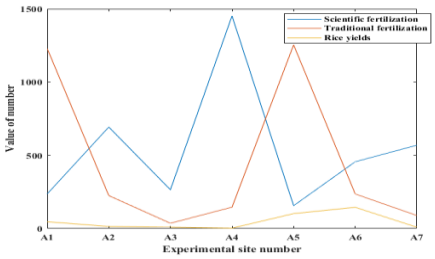

Figure 2. The influence of the developed scientific fertilization method and the traditional fertilization method on the improvement of rice yield

It can be seen from the data in Figure 2 that the scientific fertilization method developed in this high-yield cultivation technology and the traditional fertilization method have an excellent effect on improving rice yield. Compared with the general method, it can effectively save the fertilization time by 13%, increase the yield of rice per plant by 2%, and the total yield is about 10.3%.

4.2. Analysis of Technological Innovation Ability of High-Yield Rice Cultivation Industry in China

Due to the importance of rice production, China has invested a lot of money and time in relevant technological innovations. The first is the high-yielding cultivation technology for hybrid rice varieties. The high-yield dwarf varieties mainly increase the number of ears by increasing the group, but the group is very large, the rate of ear formation is not high, the seed setting rate is low, the weight of thousand kernels is small, and the disease is Heavy and prone to lodging, rice may not necessarily increase yield, but it also consumes seeds, fertilizers and pesticides. "Rare and rare" high-yield cultivation techniques, through thin-sowing, less cutting and smooth promotion of fertilizer and water management techniques, focus on large spikes based on a certain group, to avoid rapid growth during one growth period, and to severely control the other growth period. Inhibition, so that the group can develop steadily, individuals can grow well and achieve coordinated high yields. The research and development of this technology has realized the matching of varieties and technologies, which has played an important role in the promotion of hybrid rice

varieties. Aiming at the long-term seedling raising period of double-season rice production, the age of the seedlings is too large, which is not conducive to high yield, and the two-stage seedling raising method has been developed and innovative. This is a good way to reduce the dedicated seedling field and cultivate short and strong seedlings. At the same time, the flexibility of the two-stage seedling rising seedling age is good for early planting and early planting for high yield. The application of the two-stage seedling raising technique on double-season late rice has played an important role in promoting high-yield cultivation of double-season rice. China's rice cultivation area is vast and the ecological conditions are complex. The rice cultivation methods are different in different regions and the yield performance is also different. Studies indicate that rice cultivation in northeastern China is suitable for sparse planting in rice cultivation due to low temperature and high humidity and fog in Sichuan Basin; high-altitude rice regions such as the Yunluo Plateau are suitable for dense planting in rice cultivation due to dry climate and strong light; The high temperature and humidity in the rice area and the small temperature difference between day and night make the rice cultivation suitable for reasonable dense planting or moderate sparse planting. The effect of supporting high-yielding cultivation techniques of dwarf varieties on rice yield is shown in Figure 3 below.

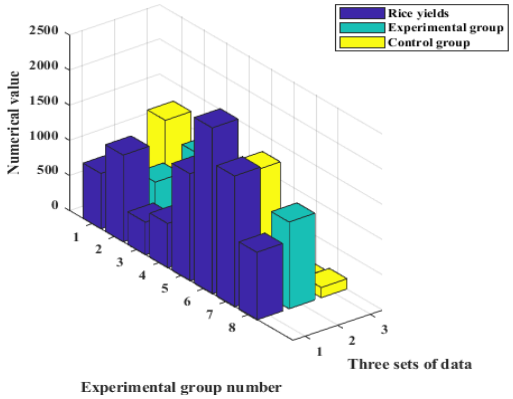

Figure 3. Effects of high yield cultivation techniques on rice yield of hybrid rice varieties

From the data in Figure 3, the emergence of high-yielding cultivation techniques for hybrid rice varieties has a greater impact on rice yield. Compared with the previous comparison, the rice yield per plant is increased by 11.5% and the total yield is about 21.5%. Second, the emergence of super-high-yield cultivation of super rice varieties, research on the characteristics of super rice varieties, and their potential for increasing yield, as well as the shift and aging of China’s rural labor force in recent years, has prompted the transformation of rice cultivation from traditional hand transplanting to mechanized, labor-saving and cost-saving cultivation The rice varieties are required to be matched with advanced modern planting methods. Aiming at the transformation of rice cultivation technology and changes in planting methods, combined with the ecological and production conditions of different regions of China's super rice, the adaptability and regional layout of the planting methods of super rice varieties in different rice regions were proposed. Compared with ordinary rice, super rice has large growth volume, large ears and large grains, and large yield potential. The comparative study on the growth characteristics and yield formation of super rice and common rice varieties in different rice regions, seasons and types shows that there is no difference in the harvest index between the two, and the total material production difference is large. Compared with ordinary rice, super rice Biological production increased by an average of 10.6%. The impact of this super-high-yield supporting high-yield cultivation technique on rice yield is shown in Figure 4 below.

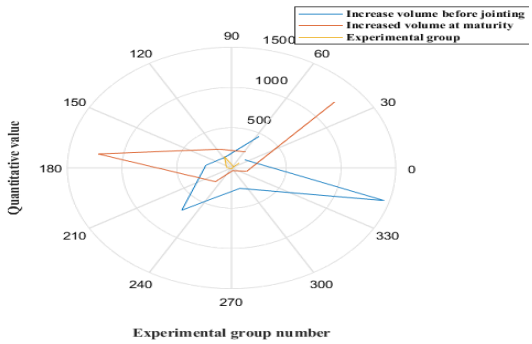

Figure 4. Effects of high yield cultivation techniques on rice yield of super rice varieties

It can be seen from Figure 4 that, through experimental testing, the superiority of this super rice variety's supporting high-yield cultivation technology on rice yield, compared with ordinary rice, the total biological yield of super rice increased by 10.6% on average. Among them, before jointing increased by 1.3%, and jointing-heading and heading-mature stages increased by 8.6% and 19.9%, respectively.

5. Conclusion

(1) This article analyzes the common problems in the current high-yield rice cultivation industry in the development of technological innovation, and discusses to solve these problems, and proposes corresponding solutions. The development and impact of relevant high-yield cultivation techniques are introduced, the relevant principles of high-yield cultivation techniques are introduced, and the development and application of hybrid rice techniques are discussed in detail. The current high-yield cultivation techniques including hybrid rice the advantages and disadvantages of technology.

(2) Analyze the development and feasibility of common rice high-yield cultivation techniques, put forward corresponding working principles and theoretical guidance, and elaborate the development and superiority of common rice high-yield cultivation techniques. Scientific breeding methods and traditional breeding methods have a great influence on increasing rice yield, which can effectively increase the yield of rice per plant by 12%, and the total yield is about 19.32%. The scientific and traditional fertilization methods developed in the high-yield cultivation technology have excellent effects on increasing the yield of rice. The fertilization efficiency is significantly better, faster, and lower in cost than the conventional traditional methods. Compared with the general method, it can effectively save the fertilization time by 13%, increase the yield of rice per plant by 2%, and the total yield is about 10.3%.

(3) Discussing the analysis of the development process of technological innovation in China's high-yield cultivation industry. After experimental verification, the rice high-yield cultivation industry has been in a state of continuous development and progress in technological innovation, especially hybrid rice technology has always been in the international leading and continuous The status of development, this technology can effectively increase rice production by about 21.5%, and the breeding cost is much lower than that of ordinary rice by about 20%. In addition, genetically modified rice technology is also constantly being developed and improved.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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