

Research on the Packaging Design Strategy of Rice Agricultural Products from the Perspective of Environmental Protection

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Abstract:

The article based on the current status and problems of agricultural product packaging design, Chinese rice with green environmental protection perspective of rice packaging design put forward the improvement design of farming products, respectively from the rice packaging graphic design, packaging design material improvement method, combining with the development of Internet + agricultural mode, to promote agricultural products of rice packaging design process of environmental protection, as well as how to rely on the Internet platform, To promote the promotion channel of environmental protection rice packaging design and further elaborate the strategy and path of the future rice agricultural product packaging design.

Keywords:

Green Environmental Protection, Rice Packaging Design, Design Strategy, Improvement Method

1. Introduction

Chinese people take rice as the main food on the table. It has long been favored because of its rich nutritional value and mellow taste. Based on data from China's National Bureau of Statistics and Customs, China's actual rice production in 2022 is 107.871 million tons. In 2022, China's rice consumption will be 107.123 million tons (Figure 1, China's rice production trend from 2011 to 2022, Figure 2, China's rice supply and demand balance statistical chart from 2011 to 2022. Source: National Bureau of Statistics, Zhiyan Consulting, and Collation [1]). Although rice is very important in the life of Chinese people, the packaging design of rice circulating in the market is unsatisfactory, especially worrying the performance of shoddy, copied packaging effect. In the modern context of the new market requirements, the traditional functional rice product packaging has been unable to meet the needs of users (Table 1 A Comparison chart of main packaging volume, size, material, features, printing, and use experience of rice packaging market). We are more concerned with the use of sustainable development measures, promoting the environmental protection process to solve the overall strategy of rice packaging design, design, promotion, and

service methods and accurately capturing the user pain points, so that rice packaging design is on the road of the green cycle.

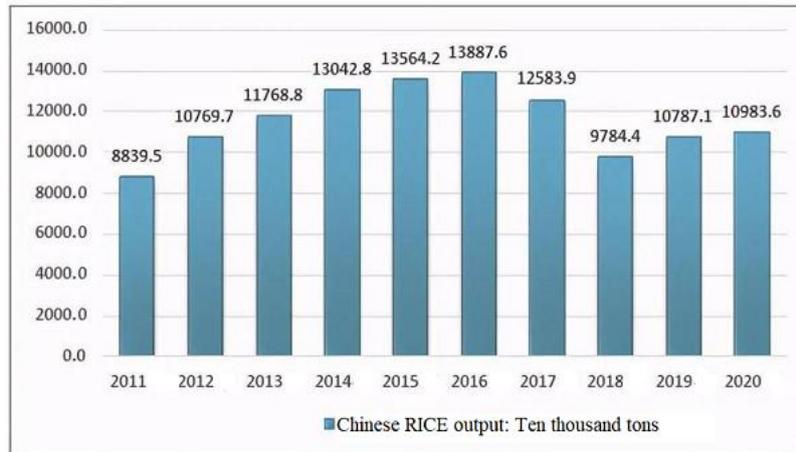


Figure 1. Trend chart of rice production in China from 2011 to 2022.

Source: National Bureau of Statistics, Zhiyan Consulting and Collation



Figure 2. Statistical chart of the balance between supply and demand of rice in China from 2011 to 2022.

Source: National Bureau of Statistics, Zhiyan Consulting and Collation.

Table 1. Comparison chart of main packaging volume, size, material, characteristics, printing and use experience of rice packaging market, material source, self-drawn by the author.

Comparison of main packaging volume, size, material, characteristics, printing and use experience in rice packaging market						
packaging volume KG	size (mm)	material	characteristics	printing	structure	Consumer Use Experience
0.25	280*200	Packed in vacuum or inflatable polythene bags (nitrogen and vacuum treatment) The vacuum	Composite plastic bag by high barrier packaging materials EVOH, PVDC, PET, PA and PE, PP and other multi-layer	Good printing; Design, trademark printing is very clear, text, bar code clearly visible,	Good shape, common brick shape	1. Vacuum or aerated storage time can reach more than half a year. 2. It is difficult to tear, tear to worry about

		degree is generally between -0.07 and -0.09 kPa	plastic composite, moisture-proof, mildew, insect control effect is good.	easy to attract customers, promote sales.		leakage of rice, tear to glue it, if not set the seal, it is necessary to clamp, it is not convenient. 3. There is no meter measuring device, so it cannot be used accurately.
1	270*400 Vacuum bag thickness 13C-15C	Composite plastic bags, or kraft paper, paper bags, cartons	Good sealing, anticorrosion, moisture-proof, insect-proof.		Modelling of the brick	
2	300*450 Vacuum bag thickness 16C-18C				Modelling of the brick	
2.5	300*500 Vacuum bag thickness 16C-18C				Good molding	1. Vacuum storage time can reach more than half a year, with carton packaging, some consumables. 2. If the sealing is not set, it is necessary to clamp it with clips, which is not convenient. 3. There is no meter measuring device, so it cannot be used accurately.
5	350*550 Vacuum bag thickness 16C-18C	Composite plastic bags, or kraft paper, paper bags, cartons			Good molding	
10 :	350*600 Vacuum	Composite plastic bags,	Good sealing, anticorrosion,		Good molding	

	bag thickness 19C-23C	or paper bags, cartons	moisture-proof, insect-proof.			
15		<p>1. woven packaging (single coated with good air permeability. Double-sided laminating needs to play through pores).</p> <p>2. Plastic bags</p>	<p>1. The requirements of rice moisture control is good.</p> <p>2. Strong tensile resistance, not easy to deformation.</p> <p>3. The shelf life of three months.</p> <p>4. On rice insect, mildew, preservation effect is relatively poor.</p>	<p>The printing quality is general, the resolution is low, the pattern quality is not good-looking, and it is difficult to obtain the recognition of consumers.</p>	<p>1. Seam linear sealing, the structure is not shaped.</p> <p>2. Some use portable structure</p>	<p>1. The hand grabbed the bag, was strangled red pain, long more difficult to lift.</p> <p>2. Packaging You need to borrow utensils when you want to take rice for cooking.</p> <p>3. Rice packaging volume is large, it is not easy to move, often wash rice, rice insects found that the product is over the shelf life phenomenon.</p> <p>4. Once the rice package is opened, it cannot be closed. The whole eating process is directly in contact with the air until the end of eating.</p>

Firstly, the rice packaging design graphic improvement method. (1). Tactile Design: The main design sources are the creative design from rice farming scenes, rice brand graphics and text logo, public image of rice cultivation, rice star endorsement, rice brand story, rice story plot narrative scenes or local scenes, rice classic legends, the development history of brand enterprises, product update information, etc. From the above design ideas dealing with the graphics on rice, packaging have been unable to meet people's increasingly diverse aesthetic needs. Therefore, the author believes that the integration of tactile design elements in packaging graphics can not only contact packaging through consumers' five senses, but also increase consumers' experience of packaging and strengthen purchasing of rice. For example, a raised shape is set in the position of a rice figure, which allows consumers to touch the figure of "rice" and feel

its smoothness. At the same time, this "rice raised figure" will emit the natural aroma of rice, so that the aroma is full of the consumer's nose, so as to associate with the consumption of rice. This design breaks the design sense that only graphics exist, and combines the visual feeling, tactile feeling, and olfactory feeling of graphics at the same time to stimulate consumers' three-dimensional tactile feeling and purchase desire for products. (2). Fully display product information with the help of network platform. In packaging design. For example, in the rice or other packages around the graphic back position such as QR code design product information, will be related to rice products distribution, harvesting, planting scene, cultivators, planting story, business, transportation time, logistics information corresponding to appear in the rice brand, such as the platform for the app or brand media, consumers to scan the QR code on the package, You can read at any time, comprehensive and accurate understanding of the information data of rice, so that the production quality of rice, brand building, enterprise management become a bridge between commodities and the market and consumers, so that consumers can buy at ease, enhance market competitiveness and differentiated sales.

Secondly, improved methods for rice packaging design materials. In each form of business, environmental protection materials are constantly mined, developed and utilized, while the new packaging technology and the driving force of packaging processing and manufacturing progress provide a broader prospect and development conditions for the product quality and labor productivity of the manufacturing industry. For example, the NUS research team at the National University of Singapore has successfully developed an eco-friendly packaging material for strengthening a composite membrane of grapefruit seed extract and chitosan (a natural biodegradable polymer derived from shrimp and crab shells), without the need for chemical additives. Because the substance is non-toxic and biodegradable; Its obvious advantages are also reflected in: its strong antioxidant and bactericidal, antiviral and film forming time short characteristics; Also has the effect of extending the shelf life of perishable food (has been successfully developed in bread packaging), this new food packaging material has great potential in food science and technology applications. The team is also committed to developing commercial new composite films as new food packaging materials [2]. Such as: The Rice brand SRISANGDAORICE from Thailand, its new packaging is made of natural shelled rice husk after rolling, then pressed film production, and use the raised rice grain embossed shape in the middle of the lid as the graphic body, with simple lines and grain graphics, LOGO and origin ThungKulaRonghai printed on the upper right corner. Against the background of the natural and simple color of rice bran, consumers can get a unique texture feeling of packaging rice bran material, eliminating the complex feeling of multi-graphic design in packaging [3]. In the selection of packaging design materials in the future, green, environmental protection, as the most important food packaging materials selection. Of course, the innovation of environment-friendly packaging materials depends on technological progress and research and development, but there are still many shortcomings in China's development of traditional high-quality materials, reprocessing and reuses of waste materials, the value of multiple reuse of one material, and the mining of local agricultural waste to "turn waste into treasure" to become effective rice packaging. This relies on the cooperation of designers, design companies, design associations, material research centers, the public, and material media platforms to build a resource base of packaging of environmental protection materials, and to help the discovery, mining and sharing of environmental protection materials in different forms.

Thirdly, Combined with the development mode of Internet + agriculture, promote the overall process environmental protection of rice packaging design. China advocates improving the level of green agricultural development, developing the new normal of agricultural development, transforming the development mode of “Internet + agriculture”, friendly agriculture, and promoting organic ecological agricultural products have become the new trend of agricultural product development [4]. Based on the special needs of the Internet + agricultural products market, how to solve the rice packaging in the production, storage and transportation, logistics, sales of various links in the industrial chain of energy saving, low consumption, environmental protection ,and other issues, has become extremely urgent. This paper believes that as a packaging designers, we should consider the different factors of rice packaging in local packing, logistics transportation, sales terminal and packaging recycling, and comprehensively solve the environmental protection problems of rice packaging in a targeted and strategic way. This process can be used for reference: first, in the environmental protection packaging design of rice, in addition to can be based on the commodity, consumer, and enterprise brand information elements to create packaging graphics; It can also use thick cardboard, kraft paper, woven materials, grain and rice husk debris, natural straw fiber, corn plastic, rape plastic and other materials similar to the color and texture of the product to directly show the texture and pattern of the packaging to replace the graphic design, to achieve the purpose of graphic design. Second, a large number of promotions of flexographic printing, waterless offset printing, alcohol-free printing ,and other environmentally friendly printing methods to print and package, reduce the environmental pollution of packaging printing; Even in the process of packaging design, the subjective reduction of color configuration in the graphics is considered to reduce the utilization rate of printing ink and reduce environmental pollution. Third, new environment-friendly packaging materials can be mined, multifunctional packaging structures can be transformed, and low-price packaging materials can be recycled to reduce the packaging logistics transportation costs and packaging price costs. Fourthly, in order to facilitate the disassembly and assembly of rice commodities in the process of logistics and sales, the design of packaging should minimize the rubber nail process and reduce the frequency of use of process materials. Fifth, consider the promotion of recycling strategies after packaging use. For example, since 1991, Germany has implemented the world's first management regulation on reducing packaging waste and advocating packaging waste recycling, namely, "Packaging Waste Management Law", which aims to control and reduce the quantity of packaging waste, and also apportion the responsibility of the government for the disposal of packaging waste to producers, suppliers and other enterprises. On January 1, 2019, Germany implemented new packaging regulations to further increase the proportion of recyclable packaging. The implementation of the new packaging regulations promoted the recycling of packaging wastes in Germany [5]. For example, the “deposit system” of beverage packaging in Germany aims to improve the enthusiasm of the general public to participate in garbage recycling consciously. When consumers buy plastic bottles or glass bottles, they will be added a deposit for the “deposit system” of beverage packaging. After drinking the beverage, they will put the empty bottle into the special recycling machine, and then they can get the deposit back or deduct the payment for goods in the supermarket [6]. The comprehensive planning of environmental protection process integration into the packaging material cycle, the whole process of production and consumption, and the whole life cycle of goods operation has positive reference significance for our country to promote environmental protection rice packaging, and even the packaging industry

as a whole. Then, we can get thinking from the way that the amount of rice can be recovered after packaging and disassembly, or the packaging and disassembly can be reused, the parts after packaging and disassembly can be transformed into commodities with smaller packaging volume for use, and the recycled raw materials can be reprocessed to make other packaging forms to improve the material properties of packaging and recycling, so as to realize material recycling and energy recovery. Actively improve the public's active participation in commodity packaging and social environmental protection behavior, to achieve the sustainability of the packaging industry operation and development. Rely on the Internet platform to enrich the promotion channels of environmental protection rice packaging design. In the context of the Internet, the web pages and APP platforms of rice packaging design, production, and sales companies do not reflect the overall and systematic view of the absorption of environmental design concepts, showing a trivial and chaotic scene. In order to facilitate the promotion and sale of rice commodities, this paper puts forward the following ideas: First, relying on the network media platform, the design and planning team determines the main regions and attributes of the demand users of agricultural products through the market research and data analysis of the sales team, and then develops the corresponding promotion scope, which is accurate to the sales city area or transnational region. Second, in the main webpage of packaging products, based on the improved configuration and partition of packaging classification information, the promotion copy, video (raw materials, production area, production, technology, sales, etc.) and animation of its cooperative rice brand suppliers are regularly updated and optimized, so as to promote the virtuous cycle of packaging to the full coverage of product formats. Third, synchronous open zone plates should be used with packing plates- making personnel analysis and ration, packaging materials, packaging and printing personnel, packaging effect production staff, can provide virtual intelligent robot can also be a real professional designer, To solve the information problems of rice sellers and consumers in selecting rice packaging design style, controlling packaging cost, material selection, production process, and other aspects, and help them choose the best scheme. They can even set up a convenient environmental protection packaging interactive small program, so that they can randomly configure their favorite visual effects in the program, but the small program retains the error correction function to help them correct the corresponding packaging effects, so that the demander can understand more professional packaging knowledge and participate in the interaction. Fourth, set up the after-sales information service area on the web page. It is particularly important to maintain and optimize the updated information of packaging and packaging products after the sale. In particular, through the later service of the network platform, customers can have good trust and expectations of products, and stabilize or expand the scope of sales.

2. Conclusions

With the development of China's economy and science and technology, the packaging design of agricultural products is becoming more and more perfect and the concept of green environmental protection is deeply popular. Against this background, the packaging design of rice agricultural products is faced with the practical problem of how to design and transform. From the material, design, communication, and another interdisciplinary cut deeply analyze rice in the concept of environmental protection countermeasures and strategies of agricultural products packaging design modification, aimed at promoting China's agricultural products packaging design level

and quality of rice, explore agricultural products packaging design integration of agriculture, economy, people the possibility of multiple formats' environmental cycle.

Conflicts of Interest

The author declares that there is no conflict of interest regarding the publication of this article.

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