



OPERATION MODE ANALYSIS AND ECONOMIC



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ABSTRACT

Glyphosate was developed by Monsanto in the United States in 1971. It is the world's largest herbicide, and it is mainly used in the cultivation of agricultural products downstream. Glyphosate is a non-selective, non-residual herbicide that is very effective against perennial root weeds. It is widely used in rubber, mulberry, tea, orchards and sugarcane fields. At this stage, there is no new supply on the production side, and the strong agricultural planting boom has caused demand to exceed expectations. The contradiction between supply and demand has expanded. and the price elasticity has risen. Industry concentration has increased, forming a pricing pattern for industry giants. The global currency is over-issued. Under the background of inflation, the price of bulk raw materials and the cost has risen, forming price support. This article collected information. combined with its own work experience, and is optimistic about the long-term business cycle of the glyphosate industry.

Keywords: glyphosate, industry supply, demand, inflation

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Declaration

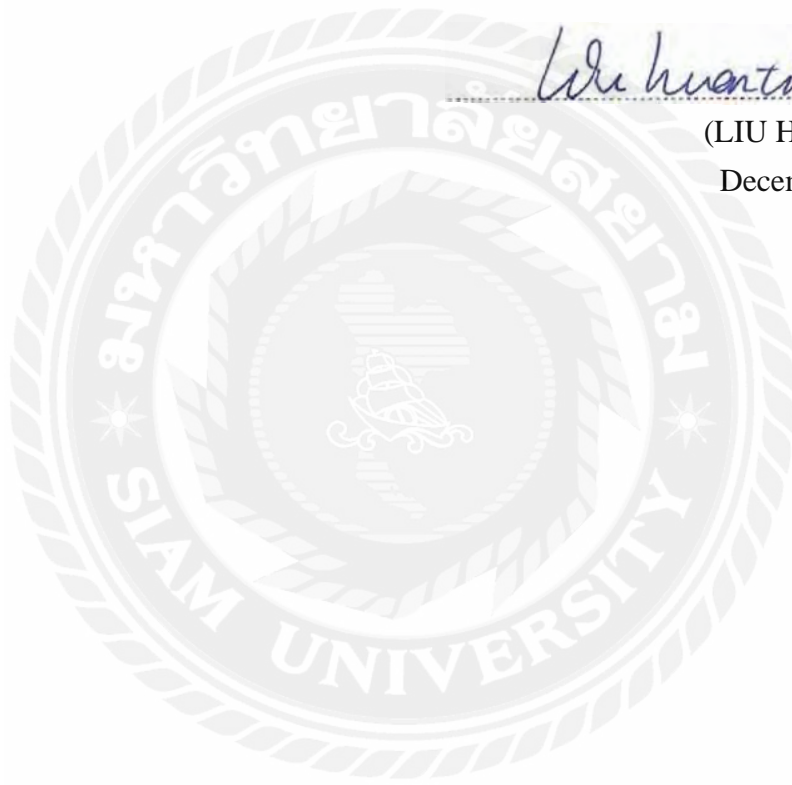
I, LIU HUANTIAN, hereby certify that the work embodied in this independent study entitled “Operation Mode Analysis and Economic” is result of original research and has not been submitted for a higher degree to any other university or institution.



Handwritten signature of Liu Huantian in cursive script.

(LIU HUANTIAN)

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1. Introduction

1.1 Research Background

Glyphosate is a highly effective, low-toxic, and broad-spectrum herbicide. Glyphosate was launched by Monsanto in the 1970s and immediately became the world's fastest growing, largest sales, and most successful herbicide so far (Shen, 1981). However, after the WHO claimed in 2015 that "glyphosate may cause cancer", there has been controversy since then, and some countries around the world have begun to ban it. In 2018, Bayer of Germany acquired the American biotechnology company Monsanto (hereinafter referred to as Monsanto). Afterwards, there have been multiple cases concerning whether the glyphosate developed by Monsanto is carcinogenic. "Glyphosate" is a warning against cancer (Arcuri & Hendlin, 2020). Bayer was therefore caught in endless legal disputes after acquiring Monsanto. In June 2020, the German Bayer Company issued a statement stating that it will pay up to 10.9 billion US dollars in compensation to settle a total of more than 100,000 lawsuits related to "herbicide causing cancer." In 2019, Guizhou carried out the cleanup operation of tea gardens, vegetable gardens and orchards, completely banned the use of chemical herbicides, extensively carried out "Prefer grass, not glyphosate" publicity activities (Cheng, 2021), and organized pesticide management and agricultural law enforcement personnel to comprehensively manage and use pesticides in the jurisdiction Check, find problems, and resolutely investigate and deal with them (Duan, 2016). And in the first half of 2019, the Guizhou Provincial Department of Agriculture and Rural Affairs investigated and prosecuted 132 drafting herbicides such as glyphosate, confiscated more than 20 tons of herbicides such as glyphosate, and fined 278,700 yuan. Developed countries have their own strict product evaluation system. To ban a product, it needs to go through comprehensive analysis and verification. However, countries in South America and Africa are not able to challenge these standards. The government may make false judgments based on the above conclusions and propose to ban (Dias, Rocha & Soares, 2019). One country's ban may have a group effect. At present, there are more than 30 countries in the world. Several countries or regions have begun to ban or restrict the use of glyphosate (Ji, 2018).

Population growth has led to an exponential increase in global food demand, significant changes in the structure of food consumption, and higher requirements for agricultural cultivation. In 2020, affected by factors such as the epidemic and La Niña, soybean planting in the United States and Brazil will be delayed, and agricultural products will enter the destocking stage. The global soybean stock-to-use ratio in 2020 is close to the lowest in 20 years, and corn has also declined for the fourth consecutive

year. The epidemic's impact in 2020 will further bring about the expectation of food shortages and price increases, stimulating the rise in food futures prices when reflected in the commodity market. The pandemic has reduced food availability by disrupting the food trade. The epidemic has highlighted the nature of food as a strategic material. Some food exporting countries are worried about their agricultural production and food supply shortages. They have taken measures to ban or restrict food exports, resulting in rising global food prices and aggravating food crisis panic. The overall situation of food security in China is good. However, as the world's largest food importer, changes in the world food situation will inevitably affect China's food security, and the country has permanently attached great importance to it. Agricultural product prices have been running at a high level, and growers' income has been significantly improved.

In the past 60 years, the proportion of herbicides in the global pesticide market has shown a trend of rising first and then stabilizing. In 2000, the global herbicide market reached 1,480.3 billion U.S. dollars, accounting for 50.8% of the global pesticide market, ranking for half of the country (Garrett, 2010). According to statistics, as of 2020, the global herbicide market size is 2.4 trillion U.S. dollars. It is estimated that the worldwide herbicide market will be about 2.65 trillion U.S. dollars by 2025, and the herbicide market will be in a recovery growth stage during 2021-2025(Kumar, 2020). Therefore, this paper analyzes the economic operation mode of glyphosate products and the economic benefits of industrial development from the perspective of glyphosate users. Since users pay more attention to user benefits and experience, whether they can provide users with a good user experience and use Effectiveness has become a key factor for companies to win in the competition (Leninkumar, 2017). It is imperative to explore the relationship between user experience and the loyalty of users, which has a specific role in promoting glyphosate products to improve user loyalty and also encourages the long-term and healthy development of the glyphosate industry (Dubey, 2019).

1.2 Research Problems

Weeding is an indispensable part of agricultural production, and the use of herbicides is very important. In the field of biocidal herbicides, people are not prosperous. As the herbicide with the largest tonnage in the world, glyphosate accounts for about 48% of the global herbicide market (Monferrer, 2019), with a product market value of up to 6 billion US dollars. The high-cost performance is incomparable. However, the opposition between glyphosate and other herbicides and ecological agriculture is basically the consensus of the industry, a "turning out chaos" to modern agriculture. Where will the glyphosate industry go in the future, and what are the factors influencing the development of the glyphosate industry.

1.3 Objective of the Study

At present, glyphosate is the largest pesticide variety in China, and it ranks first among all pesticide varieties in terms of production volume, consumption volume, output value and sales. It is still difficult to find an efficient and relatively inexpensive substitute like glyphosate. If glyphosate is banned, not only will it have a huge impact on the agricultural material industry, but it will also increase the cost of weeding in agricultural production, thereby affecting the price of agricultural products. Glyphosate is a very large industrial chain, during which complicated profit calculations are involved. It is a game between highly industrialized agriculture and ecological agriculture. At present, there is no final conclusion on whether glyphosate is carcinogenic.

1. To explore the current situation of the glyphosate industry of China.
2. To promote the long-term and stable development of the glyphosate industry, based on the conclusions drawn from the empirical analysis.
3. To specific reference and reference significance for other agricultural product enterprises.

1.4 Scope of the Study

Develop the paper through macro-environmental analysis, discuss the background of the topic selection from the macro-environment, and study where the glyphosate industry will go in the future. Through pertinent reading of relevant documents, the research status at home and abroad is summarized and analyzed, and corresponding countermeasures and suggestions are put forward. After the scale setting was completed, a questionnaire survey was conducted among users of glyphosate products. The questionnaires were mainly distributed through offline physical stores and online communities of glyphosate products.

1.5 Research Significance

Through the analysis of the industry situation, discover its internal economic laws and its position in the industry life cycle, further predict the future industry development trend, judge the industry investment value, reveal the industry investment risk, guide the business plan of the enterprise, and make the correct investment decision (Chitturi, 2008).

With the rapid development of agricultural product companies, there is still little

literature on the relationship between the user experience of farming products and user loyalty. Glyphosate products are typical representatives of agricultural product sales companies. Research on glyphosate products The relationship between user experience and user loyalty is more representative (Civelek, 2020). Therefore, based on the existing research, this paper takes glyphosate products as the research object, and the hypothesis model of the influence mechanism of user experience and user loyalty selects user perceived value as the mediating variable. User loyalty is divided into two dimensions: attitude. Dedication, behavioural commitment, and belief that users' perceived value will affect users' attitude loyalty and behavioural loyalty (Coca et al., 2009). This paper collects data through a questionnaire survey, conducts empirical analysis through SPSS 24 software, draws conclusions and verifies hypotheses, and enriches the related research theories on user experience and user loyalty of agricultural production enterprises.

According to the relevant literature at home and abroad, this paper takes glyphosate products as the research object to study how user experience affects user loyalty by affecting user perceived value (Da, 2016). This paper summarizes the relevant theories of domestic and foreign scholars on user experience, user perceived value and user loyalty establishes a conceptual model, and puts forward corresponding research hypotheses (Denaputri, 2019). On this basis, a questionnaire survey was designed and distributed to users of glyphosate products. Finally, the collected questionnaire data were analyzed by SPSS 25 software for descriptive statistical analysis, reliability analysis, validity and factor analysis, correlation analysis, regression analysis, etc (Dubey, 2019). Empirical Analysis. Finally, according to the conclusion, suggestions are put forward to improve user loyalty to glyphosate products, which will promote the development of glyphosate products, and at the same time, have specific reference significance for similar enterprises (Edem, 2019).

2. Literature Review

2.1 Glyphosate

Glyphosate is a high-efficiency, low-toxicity, broad-spectrum herbicide, the main raw material is glycine. The glycine production route has been applied earlier in China and the technology is relatively mature (Li, 2014). However, compared with the hydrocyanic acid-IDA method, it has the disadvantages of long route, high cost, high pollution, and low content. Under the situation that the domestic environmental protection pressure is further increased, unable to further expand production capacity and compete with large foreign companies (Liu, 2008). As diethanolamine is a

petrochemical downstream product, and Chinese production capacity is insufficient, it mainly depends on imports (Lu&Yang, 2017). With the rise of international oil prices, this raw material will become a major factor restricting the further development of the diethanolamine-IDA process. However, as the domestic technology for the production of hydrocyanic acid from natural gas and the preparation of iminodiacetonitrile from natural gas is mature, and the technology for the production of glyphosate by the catalytic oxidation of diglyphosate by activated carbon is further developed (Luo, 2017), domestic enterprises adopt the hydrocyanic acid-IDA method for production. Glyphosate will have the basis to compete with large foreign companies. And through the development of regeneration technology of deactivated activated carbon catalyst to ensure the long-term recycling of the catalyst (Morin, 2020), it is of great significance for the development of cleaner production and the realization of circular economy, and to improve the competitiveness of the hydrocyanic acid-IDA method (Wang, 2015).

At present, 5 herbicide resistance genes have been applied in crops: CP4. EPSP gene, mutant corn EPSP, glyphosate oxidase (GOx) metabolic system, bromoxynil hydrolase and bar or pat of the glufosinate acetylation system (Paskalev,2020). In the future, the situation of relying solely on glyphosate-resistant crops will come to an end. The next technology will be to combine glyphosate resistance with other herbicides. Such multi-resistant crops will reduce the excessive dependence on a single herbicide. However, as the core glyphosate will continue to play its important role, so its production and application area will continue to expand (Su &Teng, 2014).

2.2 Demand

Demand is the amount of a good that consumers are willing and able to buy at various prices within a given period of time (Wang, 2008). In 2012, the global pesticide market reached 53.635 billion U.S. dollars, an increase of 6.6% year-on-year. This is the first time that the global pesticide market exceeded 50 billion U.S. dollars in 2011 and continues to grow rapidly. Among them, the share of herbicides stabilized at about 44%, which is the largest category of pesticides. The rapid growth of the market has also boosted the confidence and desire of purchasers. Affected by this, the production and sales of my country's pesticide industry boomed in 2012, and the benefits improved. The glyphosate market has experienced a three-year downturn after the 2008 financial crisis, and finally showed a recovery trend (Duan, 2013).

In 2016, the pesticide market went out of a “V-shaped” reversal trend that first declined and then rose, as did the glyphosate market. Since the fourth quarter of last year, prices have continued to rise, with a cumulative increase of nearly 40%. At the beginning of the new year, the price of glyphosate has not stopped its rising pace, and some pesticide companies have raised the sales price of glyphosate one after another.

How will the price of glyphosate in 2017 change in the future? Industry insiders and institutions predict that under the influence of multiple factors such as demand recovery and environmental constraints, the price of glyphosate will probably be a slow upward trend in the future.

In the past 20 years, due to the successful commercial application of genetically modified glyphosate-resistant crops, glyphosate has become the most important herbicide in the world (Wang, 2010). At the same time, the research on glyphosate resistance has become one of the hot spots in plant science and weed science in the world. The research on glyphosate resistance in my country has just started (Yang, 2004). Therefore, it is of great theoretical and practical significance to discover new glyphosate-resistant materials in production practice, and comprehensively and systematically clarify the mechanism of its resistance to glyphosate. On the one hand, the elucidation of the glyphosate resistance mechanism will help us understand the basic plant biochemical process and the plant's defense mechanism against toxic chemicals (Zhu, 2000); on the other hand, it will help us overcome the occurrence of weed resistance and weeds in the future. The scientific management of the company provides a solid theoretical basis; at the same time, the discovery of new resistance genes with completely independent intellectual property rights will provide new research ideas and methods (Zheng, 2011). for the development of glyphosate-resistant transgenic plants (Chen et al., 2017).

2.3 Industry supply

Industry supply refers to the materials that meet the needs. In the short-term dimension, after the outbreak of the new crown epidemic in 2020, Bayer's factories in the United States, Brazil and other places have repeatedly experienced force majeure, and they have increased overseas procurement when self-sufficiency cannot be met. In China, the production and supply in Hubei was affected in Quarter 20. The flood in August 2020 affected the production of Fuhua in Leshan and caused inventory loss. In January 2021, a fire broke out in a company in Inner Mongolia. Up to now, the operating rate can only be maintained at five into about. After many unexpected events, China's inventory is far below the safety stock status. In the long-term dimension, due to the long-term downturn in glyphosate prices from 2014 to 2020, the supply continued to withdraw. In recent years, the glyphosate industry has been rapidly cleared of small production capacity due to safety and environmental constraints. There are a total of 41 glyphosate production enterprises in China, and less than 10 enterprises are operating normally. Produce. China's production capacity has been phased out from a peak of 936,000 tons in 2014 to a level of about 730,000 tons in 2017 and has remained stable (Goutam, & Gopalakrishna, 2018). In 2019, the National Development and Reform

Commission announced that the market was transferred to a negative list, and new glyphosate production facilities were restricted projects. In the future, there will be basically no new production capacity for glyphosate in China for a long time, and there will be no expansion plans overseas. The total supply of glyphosate will not decrease but not increase.

2.4 Inflation

Inflation is the continuous increase in the price level. The global currency oversupply and a large amount of capital flow into the market have brought about a rise in the prices of bulk raw materials, resulting in a collective rise in the price of agricultural products, and the price of glyphosate continues to run at a high level.

Based on summarizing relevant literature, combined with the model and the operation status of glyphosate products, this paper initially constructs a theoretical model of user experience and user loyalty. Combining the specific background of new retail, this paper draws on (Guo, 2015) point of view and divides user experience into product quality, service experience and relationship experience. This paper agrees with comprehensive "attitude-behavior" theory of user loyalty and divides user loyalty into two dimensions: attitude loyalty and behavioural loyalty (Keisidou et al. 2013). Attitude support at the emotional level. User-perceived value directly affects user loyalty, and user-perceived value is positively correlated with user loyalty (Yan, 2019). The user experience when people use a product or service significantly impacts users' perceived value (Baek, 2019). User experience is critical to continued business success, and a long-term positive user experience can increase user loyalty, and people are more willing to buy products from the same company if they have a pleasant experience with the product (Garrett, 2010). Therefore, on this basis, this paper proposes the conceptual model of this paper. A good user experience will promote users' perceived value, thereby enhancing users' loyalty to the enterprise. Specifically, by improving user experience, product quality, service experience, and relationship experience, users' perceived value can be improved, and user loyalty, attitude loyalty and behavioural loyalty can be improved.

2.5 Theory of Reviews

In designing, implementing and evaluating a new information system or technology, it is necessary to measure the user's perception and response to the system or technology, but there is a lack of research on the correlation between user perception and actual use (Evan Christy, 2022). Davis proposed the Technology Acceptance Model (TAM) when

he studied user acceptance of information systems. The model focuses on the relationship between perceived usefulness and perceived ease of use on user behavioural attitudes, adoption intentions, and usage behaviours (Firdausa Nuzula, 2022). Perceived usefulness refers to the user's belief that using a system can increase efficiency or benefit. Perceived ease of use refers to the effort users put into using a system. Perceived ease of use affects perceived usefulness in this model (Hallsworth, 2018) Perceived usefulness and perceived ease of use positively affect users' behaviour, and users' perceptions and behavioural attitudes positively affect their acceptance of the system (Henriksen, 2014).

The user's performance expectations and effort expectations are similar to the perceived usefulness and perceived ease of use in the TAM model, respectively (Higuera-Castillo, 2019). Through empirical research, the model believes that performance expectations play a decisive role in acceptance willingness and user behaviour in most cases; social influence is affected by age and gender, and those around them more easily influence young men; effort expectations are also affected by age, gender and gender. Influence of Experience, Older Women's Use Intentions as experience decreased, so did this effort expectation; contributing factors were influenced by experience and age (Holbrook, 2006). Compared with other models, the integrated technology acceptance model has more substantial explanatory power, but it still cannot explain the reasons for users' continuous use. It can only explain the reasons for users' acceptance, and it has continuity (Hu, 2013).

In empirical research, correlation and regression analysis in statistics are usually used to explore potential changes among variables (Mariyudi, 2021). Correlation analysis is mainly used to reveal the correlation between variables, and regression analysis mainly explores various changing laws between variables. The two statistical methods can not only count the dependence between variables but also measure the degree of dependence between variables, reflecting the strength of the relationship between each other (Jiménez, 2014). From the perspective of the relationship logic between variables, when performing regression analysis, there is a specific causal relationship between each variable, and each variable can be random or non-random (Khodabandehlou, 2016). From the perspective of mathematical and statistical analysis, correlation analysis can effectively reflect the degree of closeness between variables to a certain extent, regression analysis can effectively reflect the influence between independent and dependent variables, and can effectively determine future trends according to the influence of variables (Kumar, 2020).

In the research theory of this paper, it is necessary to examine the effects of user experience, user value perception, and user satisfaction on the operation mode and economic benefits of glyphosate products (Kumar, 2013). Regression analysis can establish the influence model between their respective and dependent variables (Lee,

2020). To sum up, this paper discusses the influencing factors of the operation mode and economic benefits of glyphosate products. User experience, user value perception, and user satisfaction have an impact on glyphosate products (Leninkumar, 2017). The influence of operation mode and economic benefits is mainly based on regression analysis, supplemented by correlation analysis, and the empirical research method is mainly used to verify the reliability and validity of the collected data to ensure that the collected data has good credibility (Lexhagen, 2009). Then, according to the research content, the path coefficients between latent variables in the model are estimated, and the hypothesis significance is verified.

3. Finding and Conclusion

On the whole, given its excellent effect on weeding, whether it is banned or eliminated by the market in the domestic and global markets will be a long process. Looking to the future, because the expansion of glyphosate is restricted by environmental protection policies, it is difficult to reverse the current supply shortage pattern through expansion. Demand will be strong in the next 1-2 years, and long-term demand changes remain to be seen (Luther, 2020). The main driving force for the growth of glyphosate demand in the medium and long term comes from the growth of crops, especially the growth of genetically modified planting area (especially in China), and the continued withdrawal of paraquat. Glyphosate is currently the largest herbicide with the greatest potential, and its demand is increasing at a significant rate. Glyphosate has huge potential opportunities in the future, and it is expected to usher in a stage of efficient and rapid growth. The glyphosate industry will maintain a high economic cycle from 2021-2022.

4. Recommendation

It is recommended that the company further expand its production capacity through technological transformation and investment in new construction, adhere to safety and environmental protection investment, high standards and strict requirements, and develop green and environmentally friendly production to ensure sustainable development.

Consumption upgrade is the core driving force of modern enterprise sales, production and operation. Enterprises need to create value for users, truly focus on users, and jointly serve users with upstream and downstream partners to achieve a win-win situation. Enterprises' business philosophy and product operation model must change from commodity-centred and self-centred to user-centred. Enterprises can give users an

accurate and high-quality experience, allowing users to touch the product, devote themselves to it, and obtain a pleasant consumption experience, thereby increasing user loyalty. To a certain extent, user experience is the key to competition in the glyphosate product market. To establish a good relationship with users, the operation model of glyphosate products needs to allow users to obtain a good shopping experience.

The glyphosate product operating model needs to enhance the brand experience. With continuous consumption upgrading, users' needs are becoming more and more personalized. With an increasingly fierce competitive environment, glyphosate products must be more attractive to users and meet their differentiated and personalized consumption needs. At the same time, glyphosate products increase the user's impression of glyphosate product brands through customized changes. It is essential to establish the brand image of glyphosate products in users' minds, and it is also an important strategy to increase user loyalty.

Service experience has direct and indirect effects on promoting user loyalty, and service experience determine user loyalty to a large extent. Nowadays, users pay more and more attention to the user service experience. People's shopping consumption includes commodities and closely related service experiences. Users no longer emphasize the cost-effectiveness of products but pay more attention to the service experience of products. To win the recognition and trust of users, glyphosate products need to focus on service experience and meet people's personalized service needs. The ultimate service of details, allowing users to purchase conveniently and quickly in real-time and enjoy various high-quality services, has become the key to highlighting the advantages of enterprises. The employees of glyphosate products need to serve users at any time, help users be friendly, and provide product users with relevant knowledge of pest control, as well as training on the use of glyphosate products. In this way, the user's service experience is improved. Glyphosate products can provide users with more comprehensive services to meet their personalized consumption needs, offer comprehensive, high-quality after-sales service at nearby outlets, and realize the complementarity of online and offline advantages. With data support, glyphosate products can provide users with a more efficient service experience. Glyphosate products can introduce digital thinking and use analytical tools to solve logistics problems between people, objects and markets. Glyphosate products need to focus on user needs, provide more convenience for offline customers, and improve customer service experience with the help of advanced technology. The handling of user complaints by enterprises affects user loyalty. Glyphosate products should focus on users and actively handle user complaints.

The industrial chain extends upstream and downstream to avoid the risk of upstream raw material fluctuations, stabilize the supply of raw materials, enhance the advantages of downstream channels, enrich crop protection solutions, strengthen

terminal plant protection service capabilities, and actively expand to the terminal. Combining with the changes in the policy of genetically modified crops, the layout of glyphosate and seed industries in advance, and the selection of dominant varieties provide the basis for genetically modified transformation. Deepen the global layout, allocate global resources, carry out cooperation projects around Brazil and other South American wasteland markets, try to configure localized preparations, introduce local teams, and realize localized operations.

Based on the theory of Chinese scholars, this research constructs a theoretical model and conducts an empirical analysis through SPSS25, which proves that user experience has a positive correlation with user loyalty, and user-perceived value has a positive effect on user attitude loyalty and behavioural loyalty. It has specific theoretical and practical significance. Due to my limited research ability and academic level, this paper will inevitably have shortcomings. Subsequent research can increase the items in the research model scale according to the research background, collect more user questionnaires from different regions, expand the number of questionnaire samples, and obtain more accurate research results, which can be helpful for the operation mode and economic benefits of glyphosate products. Lifting provides a more comprehensive decision-making reference. In follow-up research, various data analysis software can be used to analyze the research model better, making the resulting model and study hypothesis more reliable. In the follow-up research, the user's perceived value can be divided into more dimensions according to the research background, and the measurement items can have more sizes and options so that the obtained hypothesis model is more accurate. Subsequent research can introduce other appropriate mediating or moderating variables to explore further the user experience and user loyalty mechanism of glyphosate products.

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