

# Research on the Economic Development of Guangxi Orange Industry Under the Background of New Media Matrix

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**Abstract:** Since the outbreak of the COVID-19, the development of the orange industry has been hit hard, and seeking a window for economic recovery has become a top priority. New media platforms are inexpensive and inefficient, and have become an important way to promote economic development. The advent of the information age has brought opportunities and challenges to the development of agricultural economy. Facing a variety of new media platforms, how to make efficient use of multimedia has become the key to promoting the informationization of agricultural economy. This paper will study the development of the orange industry from the multimedia matrix.

## 1 INTRODUCTION

The new media matrix can make full use of the new media platform, construct a new media array, form a closed loop of propaganda, effectively improve the efficiency of propaganda, and achieve the best publicity effect. The ongoing coronavirus epidemic has already had a certain impact on the country's economic development. Among them, it has had a tremendous negative impact on the agricultural product planting industry. The Guangxi region is rich in resources and orange cultivation has become its main economic pillar by virtue of geographical advantages, and industrialized operation standards have been achieved earlier, but the epidemic of the new coronavirus has caused a shortage of picking workers, increased labor costs, market demand declined. In order to promote the economic recovery of the orange industry as soon as possible, we have studied and analyzed the strong driving force of the new media matrix for the development of the industry. The new media matrix can quickly disseminate agricultural product information to demanders in a matrix manner, realize the docking of supply and demand, achieve the purpose of increasing

sales, and also enable farmers to better understand market demand and adjust the direction of planting.

## 2 OVERVIEW OF NEW MEDIA MATRIX

The new media matrix is to fully integrate the modern new media platforms, to form a matrix relationship between each platform, and to promote the matrix-like dissemination of information among the various platforms. Due to the different audiences of users on different new media platforms, their preferred content is also different. According to the user portraits of different platforms, information on agricultural products will be released in a targeted manner, and the traffic resources on each platform will be fully utilized. The same subject publishes accurate content through different new media platforms, forming a multi-platform channel matrix, and diverting users from multiple platforms to a certain platform, thereby improving the dissemination of agricultural product information and achieving the best publicity effect.

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### 3 EVALUATION OF THE QUALITY DEVELOPMENT OF THE ORANGE INDUSTRY UNDER THE BACKGROUND OF AGRICULTURAL INFORMATIZATION

#### 3.1 Analysis of Influencing Factors for the Development of the Orange Industry Under the Background

##### 3.1.1 Extension of Orange Industry Chained of Agricultural Informatization

At present, the economic model of extending agriculture to the secondary and tertiary industries is developing rapidly, and the extension of the industrial chain has realized the organic integration and development of all links; in this model, planting bases are built through large-scale circulation of land factors, and then capital factors are injected into agricultural product processing, intelligent storage management, marketing, and other links, thus forming a whole industrial chain based on agricultural federation industry and commerce (Jiang, 2021). As the epitome of the development of agriculture in general, the orange industry has realized the integration of the whole industrial chain of planting, processing and sales of agricultural products, realized the value-added of the agricultural industry chain system, and promoted the efficiency and income of local farmers.

In order to study the impact of the extension of the orange industry chain on economic development, through market research and literature collection, the following three points were subdivided and scored one by one.

(1) Output value of orange planting industry: reflects the planting output of orange as an agricultural product, which is the basis for the vertical extension of the industrial chain.

(2) Output value of orange processing: reflects the degree of horizontal expansion of the orange industry, which is specifically reflected in the use of orange as raw material for agricultural product processing to enhance the value of orange.

(3) The output value of the tertiary industry of oranges: It reflects the ability of the development of oranges industry to serve the society, and the development of oranges industry drives the employment and entrepreneurship of farmers and expands sales.

##### 3.1.2 New Media Matrix Sales Expansion Factors

Under the background of informatization, the new media matrix has a great impact on the expansion of agricultural products, expanding agricultural product publicity channels through live broadcasting, releasing agricultural product information with the help of short video platforms, establishing the brand image of agricultural products through e-commerce platforms, and using social media to pay attention to user feedback (Su, 2021). The new media matrix plays a role in promoting the development of agricultural economy. Taking the orange industry as an example, it is embodied as follows:

1. It can effectively reduce the marketing cost of agricultural products and improve marketing efficiency.

2. Improve the marketing system of agricultural products and optimize the structure of agricultural economic development.

3. Promote the development of agricultural economy, improve quality and efficiency, and promote the high-quality development of agricultural economy.

In order to conduct an in-depth study of the impact of the new media matrix on the expansion of the orange industry, the relevant impact factors were scored one by one through market research and expert opinion.

(1) Network hardware facilities: The infrastructure conditions reflecting the information construction of the orange industry are the foundation for the modernization of agricultural economy

(2) Promotion of the Ministry of Agricultural Management: Reflects the role of the Agriculture-related Management in promoting the use of new media matrix in the orange industry.

(3) New media platform support conditions: reflect the software foundation in the process of using the new media matrix in the orange industry.

##### 3.1.3 Farmer Factors

As the main body of the development of the orange industry, farmer factors plays an important role in economic development, in order to study the impact of farmer factors on the development of orange industry, through market research and expert opinion, the relevant factors are scored.

(1) Farmer's education level: It reflects the education level of farmers. As the main personnel of agricultural management, although farmers have rich agricultural knowledge, they have insufficient

awareness of the development of modern technology, which makes it difficult for them to apply modern technology to manage agriculture. Rural residents generally have a low level of education, lack of technical training related to the Internet, and lack of awareness of new media, which makes it difficult to effectively use new media platforms in practical applications.

(2) New media platform awareness and application ability: reflect the legal of awareness and understanding of new media platforms.

(3) The number of people involved in the orange industry: reflects the overall scale of farmers engaged in the orange industry, and to a certain extent, it can reflect the role of orange industry in promoting employment.

### 3.2 Evaluation System for the Development of Orange Industry Quality Under the Background of Agricultural Informatization

#### 3.2.1 Purpose of Evaluation

The evaluation model of orange industry quality development analyzes the influencing factors of the development of the orange industry under the background of agricultural informatization, quantifies and scores the influential factors one by one, and finds out the key factors affecting the development of the orange industry through scientific calculation and analysis, and puts forward scientific and reasonable countermeasures for the further development of the orange industry.

#### 3.2.2 Evaluation Principles

1. The principle of objectivity. The indicators and influence intensity involved in the study can accurately reflect the development of the orange industry under the background of informatization, which is in line with objective reality.

2. Systemic principles. The model systematically analyzes the influencing factors of the

development of the orange industry under the background of agricultural informatization, from macro to micro, from objective to subjective, systematically lists the influencing factors and conducts scientific analysis.

3. The principle of reasonableness. The evaluation adopts the analytic hierarchy method, compares the two one by one, and analyzes and calculates the relevant indicators, and obtains the weight of each influencing factor, which is reasonable (Wu, 2022).

#### 3.2.3 Evaluation Methods

Using the fusion of expert scoring method and analytic hierarchy method to analyze the development of the orange industry under the background of agricultural informatization. Through the survey data, set up questionnaires, let each expert score in the form of questionnaire, and then calculate and analyze the initial data using the analytic hierarchy method to finally determine the degree of impact.

### 3.3 Data Sources

The data of this study was mainly obtained through questionnaire surveys, market research and literature collection, and the interviewees included 50 experts in the orange industry, employees in the orange industry and relevant agricultural researchers. The survey results fully reflect the intentions of experts and practitioners in the relevant fields, the data are reliable and the survey is valid.

### 3.4 Evaluation Process

#### 3.4.1 Build an Indicator System

In this study, the index system is constructed from the principle of systematization, and comprehensively considers the factors affecting the development of the orange industry in various aspects under the background of agricultural informatization. A total of 9 items were identified, as shown in Table 1

Table 1: Evaluation system for the development of orange industry under the background of agricultural informatization.

Target layer	Primary indicators	Secondary indicators
The quality development of Guangxi orange	orange industry chain extension <i>F1</i>	Output value of orange planting industry <i>(F11)</i>

industry under the background of agricultural informatization, <b>F</b>		orange processing output value ( <b>F12</b> )
		Output value of the tertiary industry of orange ( <b>F13</b> )
New media matrix sales expansion factors <b>F2</b>		Network hardware facility conditions ( <b>F21</b> )
		Agricultural management department advancement ( <b>F22</b> )

According to the scores of experts and orange practitioners in the questionnaire and the data collected in the literature, the relationship between the frequency of occurrence and the intensity of each influencing factor was sorted out and valued. The frequency of occurrence is expressed by numerical values: no occurrence is 0, rare occurrence is 1~2, occasional occurrence is 3~5, sometimes occurrence is 6~8, frequent occurrence is 9~10, and the same is the effect intensity value.

Table 2: Table of influencing factors for the quality development of orange industry in Guangxi under the background of agricultural informatization.

Indicat or factors	Frequency of occurrence	Affects intensity	Factor scoring
F1	6.86	5.96	40.9
F2	6.88	5.25	36.1
F3	6.31	5.56	35.1
F4	6.61	6.55	43.3
F5	6.71	6.01	40.3
F6	6.73	6.12	41.2
F7	6.69	4.96	33.2
F8	6.68	5.61	37.5
F9	6.66	4.55	30.3

According to Satie scale method and experts' scoring opinions, the judgment matrix is constructed by comparing two by pair. According to the expert opinions, the degree of extension of the orange industry chain, the expansion factors of the new media matrix, and the farmers' own factors are judged as follows:

Table 3: Indicator judgment matrix F.

Judgment matrix A1	F1	F2	F3
F1	1	1/3	3
F2	3	1	7
F3	1/3	1/7	1

According to the statistics of expert scoring, the judgment matrix of the secondary index factors under the first-level index (F1) is as follows:

Table 4: Indicator judgment matrix F1.

Judgment matrix F1	F11	F12	F13
F11	1	3	5
F12	1/3	1	3
F13	1/5	1/3	1

### 3.4.2 Application of Analytic Hierarchy

In this study, the AHP hierarchy model is constructed, and the influencing factors are scored by the analytic hierarchy method combined with the survey data, the relative importance of each influencing factor is determined, and the influence intensity and weight of each influencing factor are finally obtained after reasonable calculation and analysis (Wu,2022).

#### 1. Construct a judgment matrix

Intensity of Importance	Definition
1	Equal Importance
3	Moderate Importance
5	Strong Importance
7	Very Strong Importance
9	Extreme Importance
2,4,6,8	Intermediate values between two adjacent judgments

Figure 1: Satie scale method.

Similarly, the judgment matrix of the secondary index network hardware facility conditions (F21), the promotion of agricultural management departments (F22), and the support conditions of new media

platforms (F23) under the new media matrix expansion factor (F2) can be obtained as follows:

Table 5: Indicator judgment matrix F2.

Judgment matrix F2	F21	F22	F23
F21	1	5	3
F22	1/5	1	1/3
F23	1/3	3	1

The judgment matrix of the secondary index factors under the farmer factor (F3), the farmers' education level (F31), the understanding and application ability of new media platforms (F32), and the number of people involved in the orange industry (F33) are as follows:

Table 6: Indicator judgment matrix F3.

Judgment matrix F3	F31	F32	F33
F31	1	1/3	3
F32	3	1	6
F33	1/3	1/6	1

2. Calculate weights and check consistency

The row product of the matrix is calculated by the root method, and then the nth root is opened to determine the eigenvector of the matrix:

$$\bar{w}_i = n \sqrt[n]{\sum_{j=1}^n a_{ij}}$$

Then the weights are calculated according to the feature vectors:

$$W1 = \frac{\bar{w}_1}{\sum_1^n \bar{w}_1}$$

Then calculate the maximum characteristic root of the judgment matrix to obtain the agreement index:

$$CI = \frac{\lambda_{max} - n}{n - 1}$$

Finally, considering that the deviation of the agreement may be caused by random reasons, the CI and the random agreement index RI are compared to

obtain the test coefficient CR, and then the test coefficient CR is obtained

$$CR = \frac{CI}{RI}$$

If CR<0.1, the matrix is consistent.

Taking 4-1 as an example, the calculated w1=0.243 consistency test shows that λmax=3.007, CI=0.004, CR=0.037<0.1 matrix have consistency. Similarly, it can be concluded that the relative weight vectors of the influencing factors (F) of the development of Guangxi orange industry under the background of agricultural informatization are: (W1, W2, W3)=(0.243,0.669,0.088).

Similarly, the judgment matrix and weight vector under the secondary index factors are calculated, the maximum eigenroot λmax=3.039, the consistency index CI=0.0193 consistency ratio CR=0.037<0.1, and the consistency test is passed. Therefore, the relative weight vector of the output value of orange planting industry (F11) the output value of orange processing (F12) and the output value of the tertiary industry of orange (F13) under the first-level index (F1) of the second-level index factors (F1): (W11, W12, W13) = (0.637, 0.258, 0.105).

Similarly, the relative weight vectors of the secondary index factors network hardware facility conditions (F21), the promotion of agricultural management departments (F22) and the support conditions of new media platforms (F23) under the new media matrix expansion factor (F2) are calculated:(W21, W22, W23) = (0.637, 0.105, 0.258)

The relative weight vectors of the secondary index factors under the farmer factor (F31), the understanding and application ability of new media platforms (F32), and the number of people involved in agriculture in the orange industry (F33) are: (W31, W32, W33) = (0.195, 0.717, 0.088).

3. Ranking of the influence of each influencing factor: Combined with the above calculation results, the weight and comprehensive weight of each influencing factor can be obtained, and the weight of the influencing factor evaluation index is ranked as follows

Table 7: Evaluation System of Guangxi orange Industry Quality Development under the Background of Agricultural Informatization.

Target layer	Primary indicators	weight	Secondary indicators	weight	Composite weight	sort
F	F1	0.24	F11	0.64	0.15	3.00
			F12	0.26	0.06	6.00
			F13	0.10	0.03	7.00
	F2	0.67	F21	0.64	0.43	1.00



			F22	0.10	0.07	4.00
			F23	0.26	0.17	2.00
	F3	0.09	F31	0.19	0.02	8.00
			F32	0.72	0.06	5.00
			F33	0.09	0.01	9.00

### 3.5 Analysis of Evaluation Results

Through the above calculation and analysis, it can be concluded that among the influencing factors of the development of Guangxi's orange industry under the background of agricultural informatization, the impact of new media matrix sales expansion is more significant. Among the factors of new media matrix expansion, the construction of network hardware infrastructure has a greater impact. Therefore, under the background of agricultural informatization, Guangxi's orange industry should pay attention to the sales expansion of new media matrix, increase the construction of network hardware infrastructure in rural areas, and promote the development of agricultural modernization.

## 4 COUNTERMEASURES TO MAKE FULL USE OF THE NEW MEDIA MATRIX

1. Strengthen training and education for growers and enhance awareness of new media.
2. Agriculture-related management departments actively collect relevant information about oranges and actively strengthen the awareness of new media matrix.
3. Strengthen infrastructure construction to ensure the modernization of agriculture.

## 5 CONCLUSIONS

The progress of information technology has laid a solid foundation for the development of new media platforms, and the operation of new media platforms has provided a window for economic development. In the face of the impact of the new crown pneumonia epidemic, the development of Guangxi orange industry and the combination of information technology is an inevitable trend, the use of new media matrix to achieve information matrix dissemination, from the field of orange production and sales, to promote the development of agricultural economy information intelligence. Agricultural

economic in various regions should pay more attention to the advantages of the new media matrix, make more use of the new media matrix to improve the quality of agricultural economic development, and promote the modernization of agricultural economy.

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