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Current Situations and Development Recommendations for Pomegranate Industry in Lintong District of Xi'an City

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Abstract Lintong pomegranate is well known in China and ranks first among the top five famous pomegranate types in China. In 2006, it obtained the national geographical indication protection product certification. In recent years, the pomegranate industry of Lintong has developed rapidly, but there are also some problems, which have become the weak points of local economic development. In order to promote the further sustainable development of the Lintong pomegranate industry, on the basis of the questionnaire survey, the paper introduced the role of Lintong pomegranate in the county economy, resource advantages, planting and marketing, the low scientific and technological content, shrinkage of planting area, decline of brand influence of Lintong pomegranate, lack of awareness of industrialization of characteristic agriculture, single product type, short industrial chain, *etc.* Finally, it came up with pertinent recommendations on the basis of these problems. In order to develop pomegranate, Lintong District should make full use of the local advantages, broaden the marketing channels, rationally apply the theory of industrialization, improve the cooperative organization, and form the characteristic industrial chain of Lintong pomegranate.

Key words Lintong pomegranate, Characteristic agricultural industrialization, Brand effect, Xi'an City

1 Introduction

Lintong (109° 05' 49" E – 109° 27' 50" E and 34° 16' 49" N – 34° 44' 11" N) in Xi'an City of Shaanxi Province is located in the middle of the Guanzhong Plain and covers a total area of 915 km². Situated in the east of Chang'an, Lintong is adjacent to Li Mountain (Mount Li) in the south, and crosses Wei River in the north. Its natural conditions are ideal for pomegranate growth. With a long history of cultivation, Lintong has formed a unique pomegranate variety. Lintong pomegranate combines the merits of pomegranates of the whole country. With gorgeous color, big fruit and thin peel, sweet juice and soft nuclear, plump seeds, and few slags, Lintong pomegranate ranks first among the top five famous pomegranates in China. It is listed as a fruit treasure and has obtained the national geographical indication product certification in 2006. Lintong is the largest pomegranate base in China and has an annual output of more than 100 000 t of pomegranate. In recent years, the pomegranate industry has developed rapidly, but there are also some problems, mainly reflected in low scientific and technological content, single product type, short industrial chain and unsmooth sales channels, and these problems lead to prominent problem of slow sales of pomegranate and have become shortcomings of local economic development^[1–5]. In order to promote the further development of Lintong pomegranate industry, we analyzed the development status and existing problems of Lintong pomegranate industry from the aspects of planting, sales and char-

acteristic agriculture on the basis of the questionnaire survey on Lintong pomegranate industry development, and came up with the recommendations for developing Lintong pomegranate industry, so as to provide reference for the sustainable development of Lintong pomegranate industry.

2 Current situations of development of pomegranate industry in Lintong District

2.1 Status and role in the county economy Lintong pomegranate industry has developed rapidly. By 2015, the planting area of Lintong pomegranate has reached about 8 500 ha, and the annual output was about 100 000 t, making Lintong become one of the main producing areas of pomegranate in China. In Lintong District, there are five pomegranate processing enterprises, 15 famous brands, more than 30 pomegranate production and sales enterprises and professional cooperatives. Nearly 60% of the agricultural population in Lintong is engaged in pomegranate cultivation, and the annual income of pomegranate growers is about 225 000 yuan/ha. The survey results show that the family income of Lintong pomegranate production area is mainly pomegranate planting and migrant work. Among them, the income from pomegranate cultivation accounts for 58%, and the income from migrant work accounts for 37.3%. Most of the pomegranate growers have got rid of poverty due to the cultivation of pomegranate and stepped into a well-off society. Therefore, pomegranate has been reputed as a cash cow. It has become a sustainable and irreplaceable pillar industry for local farmers in Lintong.

2.2 Resource advantages (i) The location resource advantage. Lintong District is located in the central part of Shaanxi Province, only 30 km away from Xi'an, has convenient transportation and is reputed as the east gate of Xi'an City. Lintong has excellent natural conditions and belongs to the temperate semi-humid

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continental monsoon climate with mild climate and four distinct seasons. Such distinctive climatic characteristics are very suitable for pomegranate growth, so Lintong District has obvious advantages in location resources. (ii) The advantages of tourism resources. Lintong District has a long history and culture, and rich tourism resources. There are two 5A-level scenic spots in Lintong, namely, the Eighth Wonder of the World (Terra Cotta Warriors and Horses of Qin) and the Ancient Emperor Palace (Huaqing Hot Spring), two 4A-level scenic spots, including Lishan National Forest Park and the world largest underground imperial tomb (Tomb of Emperor Qin Shi Huang). Now, Lintong has gradually established three tourism culture brands: Qin style, Tang rhyme, and imperial hot spring. In recent years, Lintong District has started to expand tourism projects, integrating tourism and agriculture to form characteristic leisure tourism agriculture. As a national geographical indication protection product, Lintong pomegranate has become a major symbol of Lintong's characteristic leisure tourism industry. (iii) The advantages of variety resources. Lintong pomegranate has large planting area and many varieties (a total of 17 varieties). The main variety sweet pomegranate includes Tianhongdan, Dahongtian, Jingpitian, and Luyudan. Sour pomegranate varieties include Luyusuan and Dahongsuan.

2.3 Planting and marketing By the end of 2015, Lintong had built 871 ha of pollution-free pomegranate production base, 1 420.7 ha of green pomegranate production base, and 733.7 ha of fine pomegranate sightseeing demonstration park. At present, Lintong pomegranate sales rely largely on market retail, intermediaries purchase and online sales. The survey results show that Lintong pomegranate market accounted for 65.37% of retail sales, intermediaries purchase accounted for 22.02%, and online sales accounted for 11.3%. Lintong pomegranate retail accounted for a large proportion, online sales resources are not well used, and its sales situation is not optimistic.

3 Problems in the development of Lintong pomegranate industry

3.1 Low scientific and technological content and lack of support of technical system

3.1.1 Lack of support of technical system. There are few studies on the participation of agricultural and forestry universities in the region in the pomegranate industry system. As the most prestigious pomegranate industry and pomegranate producing areas in China, but only few experts and professors from various institutions participate in research take part in pomegranate processing and storage, while no famous experts and professors are engaged in breeding and high-efficiency cultivation of pomegranate. Besides, the modern agricultural industrial technology system in the region is not incorporated into the pomegranate industry. As a result, the lack of technical support has widened the gap between the research and promotion and industrialization of Lintong pomegranate and other pomegranate producing areas in China.

3.1.2 The breeding of new varieties is weak. The breeding methods of Lintong pomegranate varieties are backward, limited to

selection from traditional varieties, while other breeding techniques such as cross breeding are rarely applied, and the selection of international pomegranate varieties is dominated by completely soft seeds. New varieties take up a small portion in the production. The traditional main varieties have large internal differences and the standards are not uniform. According to the evaluation results of the Linfen pomegranate varieties in 2015, the main variety Jingpitian had 20 samples, the single fruit weight was 440 – 890 g, the 1 000-grain weight was 50.77 – 87.13 g, the sugar content was 11.4% – 21.0%, the seed colors were different (including dark red, bright red, pink, and pale red), these were much beyond the influence of cultivation factors, and had no inherent characteristics of the variety, thus it is urgent to screen out the representative strain of pure Jingpitian, and promote purified variety^[6].

3.1.3 The processing machinery and technology are backward. The initial processing of the initial sorting, dispensing and cleaning of the pomegranate still remains at the original manual operation stage, and the processing technology and machinery still lag behind. The initial labor investment is strong, the efficiency is low, so the product quality is difficult to guarantee. In consequence, the processing industry has not yet formed a certain industrial scale for production, processing and sales.

3.2 Shrinkage of planting area and decline in brand influence

3.2.1 Urbanization has led to shrinkage of pomegranate planting area. At the same time of economic development, the ecological protection, the cultivation of characteristic industries and the inheritance of history and culture were neglected. Lintong pomegranate's most famous Chinese pomegranate garden gradually gave way to the urban development. In 2008, the Chinese pomegranate garden, which has been reputed as Lintong's and even China's pomegranate ancestor and representative of Lintong pomegranate, disappeared in Lintong. In 2010, with the construction of the Xi'an Qujiang Lintong National Tourism and Leisure Resort, Lintong Xiekou Pomegranate Industrial Park exited the historical stage and the pomegranate planting area in Lintong shrank sharply. Then, the influence of Lintong pomegranate brand has been declining significantly.

3.2.2 The malicious competition of pomegranate growers affects the quality of pomegranate. To seek high price, pomegranate growers sell premature pomegranates. Such malicious competition directly leads to the decline of the quality of the pomegranate, which seriously affects the reputation of the pomegranate and leads to the decline of brand influence.

3.2.3 The lack of sales channels has led to overstock of products. Local pomegranate growers sell pomegranates mainly by themselves, and their sales are basically small quantity sales. Due to the low educational level of pomegranate growers, they have not been able to effectively understand the sales channels and information of pomegranate in many aspects, leading to poor online sales channels and a large number of channels for large-scale supermarkets, and leading to overstock of pomegranates.

3.3 Lack of awareness for characteristic agricultural industrialization

3.3.1 The educational level of growers is low, and it is difficult to form large-scale planting. The educational level of the growers is low, basically at the primary school, junior middle school and senior middle school, and the age is too high. According to the survey results, 58.7% of growers were the middle school educational level and 27.3% were the high school level; the growers aged 35–45 accounted for 35.3%, and the growers aged 45–65 accounted for 52.7%. Due to the low educational level and high age of the growers, the application of new techniques and management methods is not in place. Only a small number of growers have large-scale plantings. Most of them are small independent planting, which is difficult to form large-scale planting. The planting area of about 2 000 m² accounted for 46%, and the planting area of 2 000–4 000 m² took up 48.7%, and the rest was relatively small.

3.3.2 Planting and marketing awareness is traditional, and advantages of characteristic industry are to be raised. Most of the pomegranate growers in Lintong District still produce and sell by themselves according to the traditional concept. The agricultural cooperative organizations have not been fully formed, and the sense of unity among the growers is relatively weak. There is a lack of trust between growers and enterprises, and the integration chain of production, processing and marketing industries is almost in a broken state. During the development of Lintong pomegranate industry, its characteristic agricultural industrialization awareness is weak, and the extension and application scope of agricultural industrialization operation mode is small. It does not give prominence to the characteristics and scale of Lintong pomegranate industry, and the advantages of characteristic industries need to be improved.

3.3.3 The pomegranate park has poor site conditions and the infrastructure is backward. The traditional cognition of pomegranate drought resistance and barren resistance is poor. The pomegranate is mainly planted in areas with shortage of water and barren conditions. The infrastructure is backward such as water, electricity and roads. These greatly influenced the application, extension, large scale development and play of market competition of new pomegranate varieties.

3.4 Single product type and short industrial chain Lintong District has a long history and culture, and rich tourism resources. However, the pomegranate industry and pomegranate culture are not adequate. It lacks close cooperation with the "style of Zhou and Qin dynasties and rhyme of Han and Tang dynasties" tourism resources, and the characteristic pomegranate industry has not yet reached the tourism industry level. In Lintong District, there are only 5 deep processing enterprises of pomegranate drinks and 2 deep processing enterprises of pomegranate skin care products. The pomegranate products are single, limited to the sales of fresh fruits and the processing of a small amount of pomegranate wine and juice drinks. Its product type is single, the industry chain is short, and it lacks exploration of product value in depth and

breadth.

4 Recommendations for promoting the healthy development of Lintong pomegranate industry

4.1 Government attaching importance to planning and leading Lintong government should strengthen the planning of pomegranate industry in the district, increase ecological protection, and attract colleges and universities and scientific research institutions to actively support and develop regional industries through project support and policy guidance. Besides, it is recommended to actively organize professional and technical personnel to carry out pomegranate variety breeding, technology research and development, product development, and integrate Lintong pomegranate industry into regional modern agricultural industrial technology system. Lintong government should actively regulate market order and severely crack down on illegal activities such as malicious competition and substituting defective goods for qualified goods. Through holding of pomegranate cultural and artistic activities and the promotion of tastings, it is recommended to cultivate characteristic industries and combine them with history and culture to enhance the popularity of Lintong pomegranate brand and raise the production enthusiasm of pomegranate growers.

4.2 Stabilizing the planting scale and improving the quality and efficiency Lintong pomegranate industry should control the regional planting area to 3 500 ha and stabilize the pomegranate planting scale on the basis of ensuring traditionally well-known varieties. In the production area, it is recommended to reasonably guide and adjust the variety structure of pomegranate in the production area, introduce demonstration and breeding research, and continuously promote product upgrading. Besides, it is recommended to strengthen the promotion of new varieties of new technologies and industrial standardization, enhance the pomegranate brand effect, and raise the planting efficiency.

4.3 Strengthening research and development and extending the industrial chain It is recommended to strengthen technology research and development, research and develop storage technology, develop pomegranate culture products, pomegranate wine, pomegranate tea, pomegranate juice, pomegranate cake, pomegranate medicine and skin care products, develop pomegranate potted landscape and root carving handicrafts, extend the pomegranate market supply, extend the pomegranate industry chain, increase the added value of the industry, and raise the level of industrialization.

4.4 Culture driving and building the industrial brand Lintong has rich tourism resources, and there are many well-known scenic spots such as Tomb of Emperor Qin Shi Huang, Terra Cotta Warriors and Horses of Qin, and Huaqing Hot Spring. The development of Lintong pomegranate industry should strengthen the marketing and propaganda of products, continuously improve the popularity of the industry with the aid of the rich tourism and cultural resources, to promote the development of the pomegranate industry and promote the formation of the regional pomegranate brand.

4.5 Broadening the sales channels and raising the popularity

It is recommended to improve the traditional sales concept, develop a new thinking mode, and build a marketing strategy of "entity sales as the main, and online sales and supply as auxiliary", take different marketing combination means, formulate combined scheme, and take many ways jointly to solve the problem of slow sales. Besides, it is recommended to maintain the trust relationship between consumers and sellers, resist the unfair competition in Lintong pomegranate market, set up a standardized sales platform, and enhance the reputation and popularity.

4.6 Government cooperating with enterprises to gradually realize industrialization Local government should actively promote the cultivation of leading enterprises in pomegranate industrialization and the construction of professional cooperative economic organizations for farmers, and take the lead in organizing the establishment of professional cooperative organizations. It is recommended to vigorously promote the pomegranate industrialization operation mode of "enterprise + base (cooperative) + farmer, cooperative + base + farmer", form an industrial chain integrating production, processing and sales, extend the pomegranate industrial chain, reduce production risk and raise the benefits of industrialization.

5 Conclusions

In summary, Lintong District has a strong resource endowment, but the level of agricultural industrialization is still very low. It indicates that resources are only the conditions for industrial development. Only by making effective use of high-quality resources, gradually changing traditional agriculture to modern agriculture, and emphasizing characteristic development, may the existing re-

sources be transformed into local economic benefits. In the future, the development of the pomegranate industry in Lintong should focus on the new socialist countryside construction, cultivate leading enterprises with competitive advantages and driving ability, improve the marketization and organization of agricultural production, improve the organizational system and interest linkage mechanism, further improve the organization system and the interest combination mechanism, extend the pomegranate industry chain, and make effort to raise the level of agricultural industrialization management, to promote the sustainable and healthy development of Lintong pomegranate.

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