

# Current Situation and Way out of Cotton Subsidiary Industry in Xinjiang

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**Abstract:** Xinjiang is a National Production Base for Super-Large Commercial Cotton. as the Leading Industry in Xinjiang, the Cotton Industry is the Pillar to Promote Economic Development, Increase Farmers' Income and Social Stability in Xinjiang. At Present, Xinjiang's Cotton Textile Owners Are Mainly Engaged in Spinning and Weaving. the Short Industrial Chain and Low Industrial Concentration Seriously Restrict the Improvement of Xinjiang's Cotton Textile Industry's Development Capability. Based on the Analysis of the Present Situation and Existing Problems of Xinjiang's Cotton by-Product Resources, This Paper Expounds the Advantages and Constraints of Xinjiang in Developing Cotton by-Products, and Then Puts Forward Some Countermeasures to Speed Up the Development of Xinjiang's Cotton by-Product Processing Industry.

## 1. Introduction

As the Largest High-Quality Commercial Cotton Production Area in China, Xinjiang Region is Rich in Types and Resources of Cotton by-Products. in Recent Years, Some Cotton-Related Enterprises in Xinjiang Region Have Increased Investment in the Production and Sales of Cotton by-Products, Actively Introduced and Developed New Processing Technologies, Gradually Extended the Industrial Chain of Xinjiang Commercial Cotton, and Increased the Value of Cotton by-Products [1]. Cotton Production Accounts for More Than One Third of the Country's Total. as the Leading Industry in Xinjiang, Cotton Industry is the Pillar to Promote Xinjiang's Economic Development, Increase Farmers' Income and Social Stability. It is Related to Xinjiang's Social and Economic Development and Social Stability, and is of Special Significance to “Stabilizing Xinjiang and Prospering Xinjiang, and Consolidating the Border and Enriching the People”. However, Due to the Constraints of Capital, Technology, Investment Environment and Market System Construction, the Development of Xinjiang Cotton by-Product Processing Industry is Still At the Primary Stage of Development, and the Gap with the International and Domestic is Obvious [3]. How to Make Better Use of Cotton Byproduct Resources and Give Full Play to Xinjiang's Advantages in Cotton Planting and Cotton Resources Have Become the Necessary Means and Ways to Promote Xinjiang's Cotton Processing Industry to Develop in an All-Round, Multi-Level, High-Tech and High Value-Added Direction.

## 2. Utilization Value of Cotton Byproducts

See Table 1 for Cotton Planting Area and Yield in Xinjiang from 2000 to 2018. from Table 1, It Can Be Seen That the Cotton Planting Area in Xinjiang Shows a Fluctuating Growth Trend. as of 2018, the Planting Area Has Stabilized At about 2.3 Million Hm, Reaching 242.133 Hm<sup>2</sup> in 2014, the Year with the Largest Planting Area. the Total Output of Cotton Increased from 1.5 Million Tons in 2000 to 4.8 Million Tons in 2018, with the Highest Output Reaching 4.8 Million Tons in 2018. There is No Doubt That Xinjiang Has Become the Leading Province in Chinese Cotton Planting Industry.

Cotton by-products mainly include cottonseed and cotton stalk, which are natural comprehensive resources integrating cotton, grain, oil and wood [4]. All by-products have broad utilization prospects, and their economic value increases with the deepening of utilization. Cottonseed kernel is rich in protein and a variety of amino acids, the content of which is 1-2 times that of wheat, and is widely used after crushing. The cottonseed kernel after cottonseed hulling contains 35% oil and

37% ~ 40% protein. The cottonseed cake after oil extraction is an important protein resource, with much higher protein content than rice, wheat and corn, complete amino acids, rich vitamin E, and a digestibility of more than 90% [5]. It is widely used in textile, papermaking, light industry, chemical industry, petroleum exploitation, military industry, etc. The biological utilization of cottonseed hull is mainly used as the culture medium for edible and medicinal fungi. Compared with soybean meal control group, cotton protein is superior to control group in meat ratio and laying rate in broiler and layer feeding. The test results for pig breeding are good. Low phenol cotton leaves are nontoxic and can be used as feed. After the leaves are collected, they are washed, dried in the sun and crushed into cotton leaf powder, which contains 16%-18% crude protein, 1.4% crude fat and 12% nitrogen-free extract. When added to pig feed, the daily gain increases by 3.8%, and when added to cow feed, the milk yield increases by 12%-20%.

Table 1 Cotton Planting Area and Yield in Xinjiang from 2000 to 2018 (Data Source: Xinjiang Statistical Yearbook)

Year	Planting area/ten thousand hm <sup>2</sup>	Output/10000 t
2000	101.239	150
2001	112.972	157
2002	94.397	150
2003	103.705	160
2004	112.755	175.25
2005	115.799	195.7
2006	166.443	267.53
2007	178.26	290
2008	166.801	301.55
2009	140.931	252.4
2010	146.06	247.9
2011	163.806	353.95
2012	172.08	351.8
2013	171.826	351.8
2014	242.133	429.55
2015	227.311	409.36
2016	215.491	420
2017	221.747	456.6
2018	230.467	480

### 3. Comprehensive Utilization of Cotton Byproducts in Xinjiang

In recent years, enterprises have increased their investment in science and technology, actively researched and developed or imported advanced technologies, and purchased advanced equipment, gradually improving the scientific and technological content of Xinjiang's cotton byproduct processing industry chain. Cotton processing industry has developed from traditional primary ginning, spinning and oil extraction to intensive processing with comprehensive utilization of cottonseeds and cotton stalks as the main direction. The unit yield level of raw cotton is in the world's leading level. Compared with the big cotton-producing country of the United States, the unit yield of raw cotton is high and the cost is low. Cotton production technology and talent advantage is more prominent [6]. A high-density comprehensive cotton cultivation technique has been formed, which is combined with excellent varieties, water-saving irrigation, scientific fertilization, pest control and other techniques. Compared with the past, the production capacity of shelling, pre-pressing and leaching has expanded, gradually replacing the workshop production of earth pressing and shell pressing. New technologies such as tooth roll shelling, puffing leaching, and comprehensive utilization of continuous and semi-continuous oil refining have all moved to the stage of practice and popularization. However, most enterprises still hesitate to develop cotton by-products because of their own economic strength and insufficient grasp of the market, which leads to the production and development of cotton by-products in Xinjiang still in the primary stage, and the problems of low added value, low economic benefits and high waste rate of cotton by-products

are becoming more and more serious [7].

## **4. Problems and Restrictive Factors in the Development and Utilization of Cotton by-Products**

### **4.1 Existing Problem**

#### **4.1.1 Lack of Unified Planning for Industrial Layout**

The overall development of Xinjiang cotton byproduct processing industry lacks scientific planning and unified layout. The thinking and understanding on how to make better use of the advantages of resources to promote the development of Xinjiang cotton byproduct to deep processing, scale and industrialization are not clear enough [8]. This has led to disordered purchase of raw materials, production of products and disorderly output of cotton sub-industry in Xinjiang. This will not only cause a large amount of waste of cotton product resources, but also, more importantly, it has led to low income-generating capacity of these enterprises, a decline in their production enthusiasm, and a possible decline in cotton sub-industry in Xinjiang. Through the construction of high-quality cotton base, the comprehensive production capacity has been significantly improved, but compared with the international cotton power, the overall level and commercial quality of cotton production are still weak, the stamina is insufficient, and the systematic benefits of large-scale production are relatively low. Insufficient investment in agricultural technology research and extension funds; The technical service and promotion system is relatively weak; Inadequate technology integration and imperfect regional standardized production technology system; There are few evaluations on the economy and effectiveness of technology. The overall quality of cotton farmers needs to be further improved [9]. At the same time, due to Xinjiang's vast territory and far away from the mainland consumer market, high transportation prices and scarce transportation vehicles have also become important constraints on the export of cotton by-products, and are also one of the most important factors that affect the “value without market” of cotton by-products in Xinjiang.

#### **4.1.2 The Industrial Chain is Short and the Industrial System is Weak**

Xinjiang's cotton by-products have a low degree of deep processing, a short industrial chain and a low level of product structure. Most of them are primary and intermediate products, and most of them are exported for re-processing and deep processing by mainland enterprises. Despite the integration and reorganization, there is still a lack of leading enterprises with large scale, strong comprehensive strength and stable benefits. The leading enterprises and farmers have not fully established the benefit mechanism of benefit sharing and risk sharing, which does not have a strong driving effect on the production base and farmers. However, deep processing projects such as conversion of biodiesel from cottonseed acidified oil, production of xylitol and furfural from cottonseed hulls, extraction of gossypol from cottonseed meal, and production of high-quality pulp from cotton stalks are basically at the primary stage of development or small-scale production. Traditional buying and selling is still dominant and the circulation cost is relatively high. The cotton processing capacity is seriously surplus, and the market needs to be further regulated. The cotton market service system is not perfect and the market early warning mechanism has not been established.

#### **4.1.3 The Products Are Single in Variety and Low in Yield**

According to the current production situation in Xinjiang's cotton by-product deep processing industry, the products produced by the enterprises are basically concentrated on cotton protein, amino acid, viscose fiber, medium and high density board and coated profile. Even if some new varieties to be developed are added, the products are single in variety compared with the exploitable potential of cotton by-products. The development of light cottonseed is only the initial collection of pressed oil and cottonseed meal. Compared with the more developed cotton by-product processing industry in the mainland, Xinjiang's cotton sub-industry is still in a backward position. And in terms of product output, except viscose fiber and cotton protein occupy a certain proportion in China,

compared with the total domestic demand, other products have limited number of enterprises involved, low output and low market share.

#### **4.1.4 The Comprehensive Utilization Rate is Not High**

Xinjiang cotton by-product deep processing enterprises generally produce a dominant product, while some valuable by-products produced in processing are mostly sold at low prices or treated as waste, without forming an integrated industrial chain. Most cotton-related enterprises usually only consider the production of a single product when they are engaged in the processing and production of cotton by-products. Other products that do not want to be related to the production objectives of the enterprises have already been treated as wastes at low prices or even directly. This is a great loss and waste of resources, and it is also a true portrayal that cotton-related enterprises in Xinjiang have not formed a comprehensive utilization of cotton by-products for deep processing. The comprehensive utilization rate of cotton by-products is not high, and the resources have not brought maximum benefits.

### **4.2 Constraint**

#### **4.2.1 Financial and Technical Constraints**

Capital and technology are the main factors restricting the deep processing of Xinjiang cotton by-products. As the main body of research and development, enterprises lack necessary financing channels. Due to the impact of international crude oil prices and other factors, domestic diesel oil and agricultural materials prices have also increased, resulting in continuous increase in cotton planting costs in our region. At the same time, due to the severe shortage of labor, the cost of picking up flowers is also rising, and the income of cotton farmers is greatly affected by the rise in various costs. The difficulty in funding sources and the government's relative lack of attention to the technological innovation of cotton by-products have also brought the upgrading and progress of cotton by-products and the development and cultivation of related markets to a standstill, with slow progress. In addition, the government has not invested enough and paid enough attention to the technological research and development and market cultivation of deep processing of cotton by-products, and has not formed a set of perfect incentive and compensation mechanism for the development, application and promotion of high and new technologies. As a result, the technological research and development in some key fields and key links of cotton by-product processing have been affected, which has restricted the technological innovation and application and delayed the industrialization process. This unsatisfactory financing and technology situation also results in Xinjiang's cotton sub-industry still staying at the initial stage of product development and marketing. Compared with mainland cotton by-product enterprises, its competitiveness is obviously insufficient.

#### **4.2.2 Restriction of Investment Environment**

Xinjiang's infrastructure construction is relatively backward, its economic development level is relatively low, and its market system is not perfect. There is a lack of unified coordination and policy guidance in encouraging external investment, and the fiscal and tax policies, land policies, financial policies, labor and personnel policies and so on lack of matching, and the inclination is not large. Compared with the mainland, infrastructure construction is relatively backward, the overall economic level and level of economic development are relatively low, and the development of market economy is still in its initial stage. In the guidance of agricultural economic policies, a series of tax policies, land policies, financial policies and human resources policies all lack matching and coordination. There is a lack of coordination and mutual support between relevant industries and departments, and no long-term mechanism has been formed to support the sustainable development of cotton byproduct deep processing industry. This has led to the slow development of agricultural enterprises and agricultural economy in Xinjiang region, including cotton sub-industries, and the production and processing of cotton sub-industries have not yet formed a long-term mechanism for sustainable development.

### **4.2.3 Seasonal and Regional Shortage of Processing Materials**

Cotton by-product processing shows intermittent production due to the seasonal supply of raw materials. When purchasing raw materials, enterprises cannot purchase enough raw materials for the whole year due to capital constraints. Xinjiang's seed cotton harvest season is concentrated in September to October of each year, and the supply of raw materials is relatively sufficient in these two months. Enterprises will generally choose to purchase in these two months to meet their own production and processing needs. In addition, Xinjiang has a large number of small and medium-sized cotton processing enterprises, local protection and disorderly competition in raw material purchasing. Some enterprises are unable to reasonably determine the production scale and development mode, and have insufficient consideration on the form and radius of raw material collection, resulting in regional shortage of raw material supply. The coordination degree of each link still needs to be adjusted. To form an industrial scale, cotton needs to continuously explore and improve. It also needs to use scientific strength to carry out effective management and increase the income of cotton farmers. Due to the lack or difficulty of forming its own purchasing network, seasonal and regional shortages of raw materials have become one of the factors restricting the development of enterprises.

## **5. Countermeasures and Suggestions on Promoting Comprehensive Utilization and Development of Cotton Byproducts**

### **5.1 Overall Planning of Industrial Layout**

The cotton by-product processing industry is still in the primary stage of development in Xinjiang, and government departments at all levels should pay enough attention to the development of the cotton by-product processing industry. From the internal point of view, we should sum up our own shortcomings in development and our own advantageous resources, constantly strengthen ourselves, and from the external point of view, we should focus on learning from the advanced and mature production experience in the mainland and actively introduce advanced production technologies and talents. According to the relative singleness of cotton types in Xinjiang, combined with the requirements of textile on the quality and quality of raw cotton, cotton can be planted in multiple types according to fiber length, and different types of cotton can be spun into cotton yarn of different standards. Set up the cost concept, strengthen the cost control in all aspects of cotton production, and strive to improve the price competitiveness of Xinjiang raw cotton; According to the characteristics, distribution and existing pattern of Xinjiang cotton byproduct resources, the development direction, key areas and key projects of Xinjiang cotton byproduct processing industry are planned as a whole. To further optimize the regional distribution of cotton planting and consolidate the advantageous production areas; Taking cities and counties as a unit, according to the regional ecological characteristics and production management level, do a good job in the quality layout and the variety layout of different fiber types, and strictly manage the variety regionalization; According to the basic principle of “stably developing high-quality and high-yield cotton areas, compressing medium and low-yield cotton areas, and resolutely withdrawing from non-suitable cotton areas”, the focus will be on “increasing unit yield, stabilizing total yield, improving quality, and increasing benefits”, optimizing the allocation of resources, forming the best regional pattern for cotton production, and resisting market risks with high quality and high yield.

### **5.2 Establish Supporting Policies and Strengthen Supporting Support for the Industry**

In light of Xinjiang's overall cotton development strategy, support policies should be formulated to support the development of cotton byproduct processing industry. Enterprises investing in cotton byproduct processing should be given preferential treatment in land use, tax relief, financing loans, etc. Therefore, the local government departments should formulate appropriate development strategies and give appropriate policy support based on the actual situation of the development of the local cotton subsidiary industry, which is embodied in helping cotton by-product production enterprises in terms of land use, tax incentives, financing loans, etc. We should seize the

opportunity, make full use of the domestic support space allowed by WTO rules, and implement “green box” and “yellow box” policy support, such as subsidies for agricultural inputs such as seeds and irrigation, subsidies for agricultural marketing loans, and increased investment in agricultural scientific research, pest control, agricultural product market promotion services, etc. The agricultural, textile, chemical, machinery, medicine, building materials, food processing and other departments associated with the processing of cotton by-products should strengthen their supporting support in policies to increase coordination and mutual support among them. The export tax rebate rate for bulk agricultural products and their processed products should be increased, and tax rebates should be carried out according to the VAT rate. Cooperate with the reform of rural taxes and fees, reduce or cancel agricultural taxes on the basis of gradually expanding the rural collective economy.

### **5.3 Establish Diversified Financing Channels**

We will closely combine the development of cotton by-product processing industry with the preferential policies of the state and the autonomous region in the development of agricultural and sideline products processing industry, circular economy, high-tech industry and the utilization of renewable resources, and strive for financial support from the state and the autonomous region to the greatest extent possible. In the face of this situation, the development of cotton sub-industry in Xinjiang region should be closely combined with preferential policies of the state and Xinjiang region in the production and processing of agricultural and sideline products, sustainable development of the economy, high-tech industries and renewable utilization, so as to maximize the financial support of the state and the autonomous region government. To guide financial institutions to increase credit to cotton by-product processing enterprises, especially to enterprises applying high technology for production, to support them to use patented technology as a guarantee to bank loans, to support cotton by-product processing enterprises to finance through the capital market.

### **5.4 Strengthen Technological Development and Innovation**

Vigorously introduce domestic and foreign advanced production equipment, production technology and technology patents to transform and improve the overall level of Xinjiang cotton byproduct processing industry. Therefore, cotton byproduct production enterprises in Xinjiang should vigorously introduce domestic and foreign advanced production equipment, production technology, production technology and other things with a certain scientific and technological content and leading. Within the scope of industrial standards, firstly, cotton breeding and planting should be directly oriented to market demand; Second, in the cotton production and processing process, the upper, middle and lower reaches should have a good connection in terms of quality standards. Establish and improve standards and management systems for quality control of improved varieties, production control of raw cotton, processing control of raw cotton, ecological environment monitoring, etc.; Through the integration and improvement of standards, the integration standard and management system of cotton industry chain will be gradually formed. Therefore, our country should pay more attention to the supervision of cotton quality varieties to form industrialized management, reduce costs in some unnecessary links and improve core competitiveness. We should integrate all forces to improve the independent research and development capability of Xinjiang cotton byproduct processing industry and gradually form some patented technologies and products with independent intellectual property rights.

## **6. Conclusion**

After Chinese accession to the World Trade Organization, profound changes have taken place in the external conditions for the development of the cotton industry: the world cotton market is highly unified, and the capacity of the cotton market is rapidly expanding. The climatic conditions and policy conditions mentioned in this article that are suitable for the development of Xinjiang region are favorable conditions for the development of the agricultural industry in Xinjiang region. However, the problems and limiting factors mentioned in this article are mostly unique to the cotton subsidiary industry. Xinjiang should actively take the initiative to undertake the transfer of the

cotton textile industry in the east, extend the cotton textile industry chain, make the cotton textile industry bigger and stronger, and replace the traditional ideas of decentralized management and separate fighting for the development of the cotton textile industry with the concept of cluster development of the cotton textile industry, so as to realize the revitalization of the cotton textile industry and realize the transfer from a self-sufficient industry to a market competitive industry. Make full use of the international and domestic two cotton markets and two cotton production resources, optimize the allocation of cotton production resources, improve the utilization efficiency of cotton production resources, give full play to the comparative and competitive advantages of the cotton industry, improve the quality of cotton, cultivate cotton brands, actively explore the world cotton market and participate in international competition.

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