

Market Trend and Development Strategies for Seed Industry in Hubei Province

Qizhen HUANG*

Institute of Agricultural Economics and Technology, Hubei Academy of Agricultural Sciences, Wuhan 430064, China

Abstract Crop seed industry is a national strategic and basic core industry, which is the foundation to promote the long-term stable development of agriculture and guarantee the national food security. Hubei is a major agricultural province in central China, and the healthy development of Hubei seed industry plays an important supporting role for the stability and prosperity of the national seed industry. Based on analyzing the scale and characteristics of Hubei seed demand, the market value of Hubei commercial seed is evaluated, the problems of Hubei seed industrial development are discussed, and some recommendations are put forward to strengthen development of Hubei seed industry.

Key words Hubei Province, Seed industry, Market trend, Development strategies

1 Current seed demand in Hubei Province

Objective analysis of problems in seed industry and studies on development measures are of great significance to ensuring food security and promote sustainable and healthy and rapid development of agriculture in Hubei Province. Based on the data in *Hubei Rural Statistical Yearbook (2015)*^[1], the agricultural seeds in this study refer to the seeds required for farming, not including the seeds in forestry, animal husbandry, aquaculture, flower industry and grass industry. In 2014, the agricultural seed value reached 21 billion yuan in Hubei Province. The seed quantity of rice, vegetables, melons, wheat, potatoes, corn, cottonseeds and beans reached 1.09 million t, and the seed sum was 17.5 billion yuan, accounting for 83.40% of total agricultural seed sum.

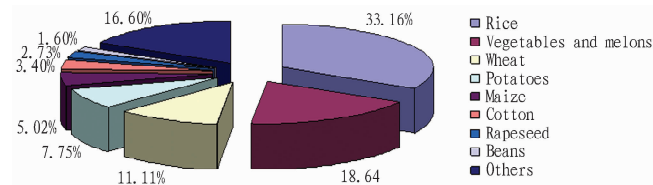
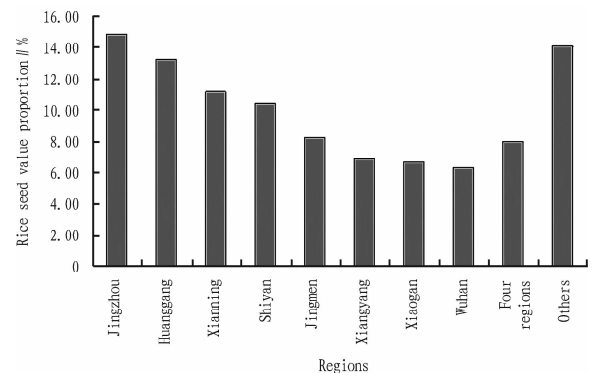


Fig. 1 Seed value structure of main crops

1.1 Rice seed use Rice is the crop with the heaviest use of agricultural seeds in Hubei Province and is widely planted in most regions of the province. In 2014, the rice seed quantity was 0.244 million t in Hubei Province and the sum reached 6.97 billion yuan. The regions with seed sum of over 500 million yuan include Jingzhou, Huanggang, Xianning, Shiyan, Jingmen and four regions directly under the control of the province, with total sum of 4.6 billion yuan, accounting for 65.96% of total seed sum of the province.

1.2 Vegetable and melon seed use The planting of vegetables and melons in Hubei Province mainly reflects suburban location

advantages of large and medium-sized cities and mountain characteristic resource advantages. In 2014, the vegetable and melon seed quantity was 0.186 million t in Hubei Province, and the sum reached 3.92 billion yuan. The regions with seed sum of over 500 million yuan include Jingzhou, Yichang, Xiangyang, Enshi, Xianning, Shiyan and Xiaogan, with total sum of 3.3 billion yuan, accounting for 84.65% of total seed sum of the province.



Note: The four regions directly under the control of the province mean Xi-antao City, Qianjiang City, Tianmen City and Shennongjia forest area, the same below.

Fig. 2 Comparison of rice seed value in different regions

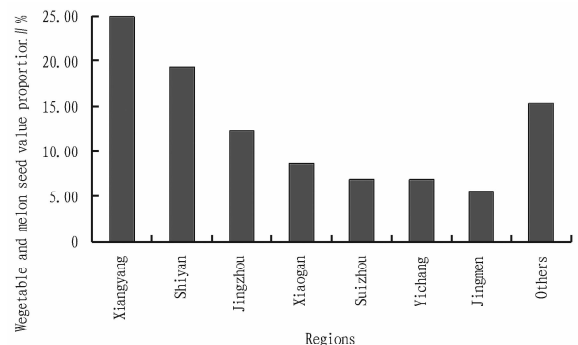


Fig. 3 Comparison of vegetable and melon seed value in different regions

Received: May 4, 2017 Accepted: July 21, 2017

Supported by Agricultural Economy and Information Branch Center of Hubei Provincial Center of Agricultural Science and Technology Innovation.

* Corresponding author. E-mail: 1792966549@qqcn.com

1.3 Wheat seed use Wheat is the third largest crop in terms of agricultural seed quantity in Hubei Province, and its planting is relatively concentrated. In 2014, the wheat seed quantity was 0.21 million t in Hubei Province, and the sum reached 2.335 billion yuan. The regions with seed sum of over 100 million yuan include Xiangyang, Shiyan, Jingzhou and Xiaogan, accounting for 91.52% of total seed sum of the province.

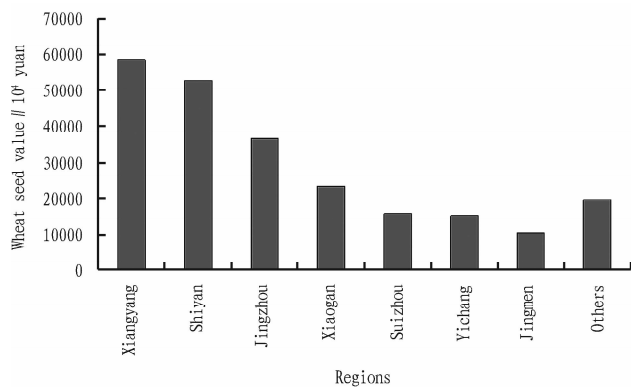
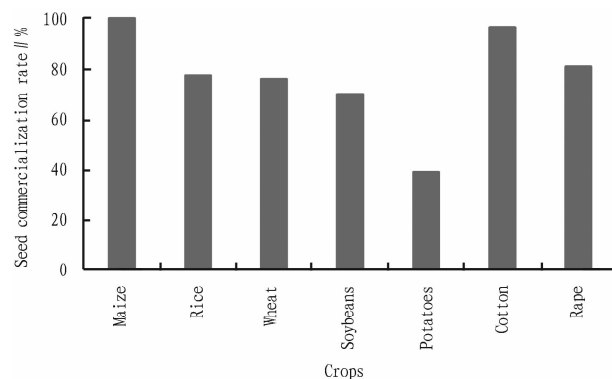


Fig. 4 Comparison of wheat seed value in different regions

1.4 Commercial seed value assessment According to the assessment data of ISF (International Seed Federation), China's seed market value was \$9.95 billion in 2012, at that time ranked second in the world^[2]. Total seed market scale in an area = Total area of cultivated land × seed quantity per ha × Commercialization rate × Average food price × Ratio of seed price to grain price^[3]. As of 2014, the average seed commercialization rate of China's main crops reached 70.07%, and the maize, cotton and rape seeds had

high commercialization rate. The commercialization rate of maize seeds was 100% and the commercialization rate of potato is lowest, reaching 39.24%^[4]. According to the experts' estimate, the seed market value of peanuts, melons, vegetables and flowers is about 28 billion yuan, the seed market value of other crops is about 5 billion yuan, and the total seed market value is about 114.928 billion yuan^[5]. In 2015, the annual seed turnover was over 5.3 billion yuan in Hubei Province, ranked sixth in China; the rape seed market value was ranked first in China; the hybrid rice and hybrid cotton seed market value was ranked second in China. Based on the planting scale, seed quantity per unit area and seed price of various crops in Hubei Province, coupled with national seed commercialization rate, the total crop seed value in the province is estimated to be more than 7 billion yuan.



Data source: National Bureau of Statistics and Ministry of Agriculture.

Fig. 5 Seed commercialization rate of seven kinds of crops in 2014

Table 1 China's seed market value in 2014

Crop	Commercial seed quantity//10 ⁴ kg	Weighted unit price//yuan/kg	Market value//10 ⁸ yuan
Maize	119627	22.93	274.35
Hybrid rice	24440	48.50	118.54
Conventional rice	64720	7.22	46.73
Wheat	355897	4.65	165.64
Soybean	34026	7.65	26.02
Potato	97037	2.97	144.26
Inland conventional cotton	2364	26.61	6.29
Xinjiang conventional cotton	8921	14.99	13.38
Hybrid cotton	850	127.24	10.82
Conventional rape	592	30.14	1.78
Hybrid rape	1322	86.87	11.48
Melons, vegetables, flowers	-	-	280.00
Others	-	-	50.00
Total	-	-	1149.28

Note: Data are from *China Seed Industry Development Report* (2015).

2 Problems

2.1 Small business scale and low market concentration At present, there are a total of 100 seed companies in Hubei Province, but most of companies have registered capital of less than 30 million yuan. In 2015, the annual seed turnover in Hubei Province exceeded 5.3 billion yuan, ranked 6th in China; there were only 8 seed companies with annual sales of over 100 million yuan (10⁶ in

2014); the top 10 enterprises of seed industry had turnover of only 2 billion yuan^[6]. 57 key credit Chinese seed enterprises were identified in September 2016, and Hubei had three enterprises in the list (Wuhan Wuda Tianyuan Biotech Co., Ltd.; Hubei Seed Group Co., Ltd.; Hubei Huimin Agricultural Science and Technology Co., Ltd.), ranked 34th, 35th and 39th, respectively. Most companies have small operating scale and low industry con-

centration, which will inevitably lead to poor business market competitiveness and weak anti-risk ability.

2.2 Weak business breeding R&D capability In terms of overall R&D in Hubei Province, the breeding level is not weak, but the innovation capacity of seed company (except rape and cotton) is not strong. There are less than 10 seed companies with real ability to independently research and develop varieties, and most enterprises do not establish R&D institutions. The seed companies with research investment accounting for more than 5% of sales are even rare. The technical force is strong in rice breeding, but there are few varieties with breeding breakthrough in recent years. The province's production is mainly based on the varieties from other provinces. In terms of wheat variety breeding, there is quick progress in recent years, but compared with Henan's varieties, it still can not show the advantages so that the domination of Henan's wheat in Hubei is not fundamentally changed. In terms of maize breeding and seed production, Hubei has no advantage at all, and it is basically dominated by the varieties from other provinces. The weak innovation capacity will inevitably affect the formation of varieties and brands with the independent intellectual property rights, ultimately leading to lack of development potential.

2.3 Disjointed industrial chain The complete industrial chain of modern seed industry includes basic research, breeding, production, marketing and technical services, but it is disjointed in China. The seed companies are mainly responsible for seed processing and marketing; the innovation and basic research is mainly concentrated in universities and central research institutions; breeding is mainly concentrated in state-owned institutions such as

agricultural institutes and agricultural universities at all levels; production is mainly concentrated in specialized production companies; technical services are mainly concentrated in agricultural technology promotion departments. Even the seed companies with a slightly complete industrial chain have only a handful of breeding and technical services, and the better companies bear a part of production, but the breeding and technical service strength is very weak, and the production capacity is limited. There is hardly any seed industry company with a complete industry chain. It is the case for Hubei Province and entire country.

2.4 Weak competitiveness in seed industry market competition Since 2014, China has had 40 small and medium-sized seed companies listed in National Equities Exchange and Quotations. Hubei Zhongxiang Agricultural Technology Co., Ltd., Hubei Qinlao Nongfu Ecological Agriculture Co., Ltd., Hubei Kangnong Seeds Co., Ltd. and Wuhan Weierfu Biological Technology Co., Ltd. have been successfully listed. In 2008, Jingchu Seed Industry and Xiangfan Zhengda were included in the list of top 16 China's seed companies with annual sales income of over 200 million yuan. At present, Hubei's largest seed company is only ranked 34th in China's seed industry. More worryingly, these seed companies face increasing competitive pressure from Fengle Seed Industry and Quanyin High-Tech in the east, Longping High-Tech in the south, Qiule Seed Industry in the north and a number of seed companies with strong strength in hybrid rice business in the west. Hubei's seed industry has been beset by these enterprises, facing hostility on all sides.

Table 2 Four Hubei's seed companies listed in National Equities Exchange and Quotations

Company name	Abbreviation	Stock code	Listing date	Main business
Hubei Zhongxiang Agricultural Technology Co., Ltd.	ZhongxiangAgrotechnology	832673	2015-07-08	Seed production and management of major crops
Hubei Qinlao Nongfu Ecological Agriculture Co., Ltd.	Qinlao Nongfu	833506	2015-09-09	Strawberry seedling technology research and development, production and sales
Hubei Kangnong Seeds Co., Ltd.	Kangnong Seeds	837403	2016-05-23	Maize seed research and development, breeding, promotion and services
Wuhan Weierfu Biological Technology Co., Ltd.	Weierfu	838103	2016-07-13	Vegetable, flower seedling cultivation, medium-to-high grade potted flower production

Note: The data are collated according to the relevant announcement.

3 Recommendations

3.1 Enhancing the seed industry mergers and acquisitions

The seed industry is an industry with high demand for funds, high technical barriers and long cycle, and the industry concentration improvement must be achieved by merger and integration. Due to the special nature of the seed industry, from the experience of the development of international seed industry, it is impossible to make the company bigger and stronger relying on its own development. Mergers and acquisitions are the only way for Chinese seed companies to become bigger and stronger. The main management departments should take full advantage of the trend of China's seed industry mergers and acquisitions, to research and develop practical restructuring plans and measures. At the same time, it is necessary to encourage industrial and commercial capital and financial

capital into the seed industry to support innovation and development of seed industry, and offer preferential support to 3-5 key enterprises by acquisitions, mergers and reorganization within three years to achieve effective integration of resources and advantages.

3.2 Further strengthening commercial breeding research

Strengthening commercial breeding research is the inevitable requirement of establishing modern seed enterprise system and also the urgent need of seed enterprise to enhance core competitiveness. Through policy control and capital guidance, it is necessary to make resources and government R&D investment concentrate in the seed companies with R&D basis and strength. It is necessary to continue to implement the "provincial special seed fund" support policy, and optimize the investment structure to support the key seed companies so as to enhance seed research, production, pro-

cessing capacity, promote the use of improved varieties and constantly enhance overall business competitiveness. It is also necessary to further strengthen the combination of production, learning and study, and encourage businesses to establish long-term strategic cooperation or alliance with agricultural colleges and provincial research institutes, in order to promote joint construction of college-business R&D platform and seed industrial technology cooperation.

3.3 Further strengthening applied basic research The basic and public welfare research is the foundation for cultivating new varieties with major breakthrough and also the premise of enhancing China's seed industry science and technology innovation capacity as soon as possible. It is necessary to give full play to leading role of agricultural scientific research institutions in the basic and public welfare research of seed industry science and technology. By strengthening the integration of technical forces, optimizing the knowledge structure and building the research platform, it is necessary to focus on the tapping and creation of germplasm resources, exploration of important genes, breeding theory and technology breakthrough, seeding and processing technology innovation, and seed quality standards and testing technology research, so as to provide a solid technical foundation for commercial breeding research and provide support and sources of innovation for enhancing seed industry innovation capacity and market competitiveness in Hubei Province.

3.4 Improving policy control and market management By strict licensing, strict enterprise access and other policies and measures, it is necessary to guide the excellent seed companies inside and outside the province to accelerate combination, merger

and reorganization. By policy support and project guidance, it is necessary to actively carry out in-depth cooperation between colleges and enterprises to enhance the capability of independent innovation. It is necessary to innovate upon the concept of "prevention first, comprehensive monitoring, full service", strengthen three links "source monitoring, circulation monitoring, after-sales tracking", and effectively prevent the use of inferior seeds, to minimize business risk and production risk and provide policy support and orderly market environment for sound development of seed companies.

References

- [1] The Editorial Board of Rural Statistical Yearbook of Hubei Province. The rural statistical yearbook of Hubei Province in 2015[M]. Beijing: China Statistics Press,2015: 11. (in Chinese).
- [2] International Seed Federation. Estimated value of the domestic seed market in selected countries for the year 2012 (Updated June 2013) [EB/OL]. http://www.worldseed.org/cms/medias/file/ResourceCenter/SeedStatistics/Domestic_Market_Value_2012.pdf.
- [4] CNII. Analysis on the present situation analysis and the development trend of China's seed industry and prediction in 2016 [EB/OL]. <http://www.chyxx.com/industry/201608/441071.html>,2016-08-24. (in Chinese).
- [5] Administration of Seeds, Ministry of Agriculture, NATESC, The Ministry of Agriculture Science and Technology Development Center. China's seed industry development report in 2015 [M]. Beijing: China Agriculture Press,2015. (in Chinese).
- [6] DENG GS. The speech of modern seed industry development training meeting in the whole province [EB/OL]. <http://cs.hbagri.gov.cn/sczgj/cyxx/179215.htm>,2016-03-30. (in Chinese).
- [40] CAO XM, GUO DJ. The related study on college students' understanding of the exam and depression and attribution style[J]. Journal of Gannan Teachers' College (Social Science (2)), 1998 (2): 84-87. (in Chinese).
- [41] Malecki CK, Demaray MK. Measuring perceived social support, development of the childanadolescents social support Scales [J]. Psychology in the School, 2002, (39): 1-18.
- [42] Calsyn J, Winter J, Burger GK. The relationship between social anxiety andsocialsupport in adolescents; test of competing causal models [J]. Adolescents, 2005,40(157): 103-113.
- [43] XIN ZQ, CHI LP. The relationship between happiness and social support [J]. Acta Psychologica Sinica, 2001,33(5):442-44. (in Chinese).
- [44] JING SH. The study of the college students' subjective well-being[J]. Youth Studies,1997(1):21-25. (in Chinese).
- [45] Kahn RL, Antonucci TC. Convoys over life course: Attachment, roles and socialsupport. In P. B. Baltes& O. G. Brim(Eds). Life Span development and behavior[M]. NewYork: Academic Press,1980;253-286.
- [46] Bertocci PA, Millard R Impersonality and the good: Psychological and ethical perspectives[J]. New York: David Mc Kay, 1963, 21(3):74-79.
- [47] Ramesht M, Farshad C. Study of life skills training in prevention of drug abuse in students[Z]. Proceeding of the 3rd Seminar of Students Mental Health; 2006 May 24-25; Iran Universityof Science and Technology; Tehran, Iran. Persian.
- [48] Kahn RL, Antonucci TC. Convoys over life course: Attachment, roles and socialsupport. In P. B. Baltes& O. G. Brim(Eds). Life Span development and behavior[M]. NewYork: Academic Press,1980;253-286.
- [31] Efficacy of life skills training on subjective well-being of students; A report from Rafsanjan, Iran. [J]. Rezvan Sadr-Mohammadi MSc, Mehrdad Kalantari Ph D, HosseinMolavi Ph D, Received; 5 Sep 2013; Revised; 11 Oct 2013; Accepted; 5 Jun 2014.
- [32] Ramesht M, Farshad C. Study of life skills training in prevention of drug abuse in students[Z]. Proceeding of the 3rd Seminar of Students Mental Health; 2006 May 24-25; Iran Universityof Science and Technology; Tehran, Iran. Persian.
- [33] JI N. The development of college student subjective well-being scale [D]. Tianjin; Tianjin Normal University, 2006. (in Chinese).
- [34] CHENG JW. Relationship between subjective well-being and personality traits of university students[J]. China Journal of Health Psychology, 2006,14(2): 144-147. (in Chinese).
- [35] LI HS, GUO DS. Research on the influence of family environment on the interpersonal relationship of post-90s-undergraduates[J]. Journal of Lanzhou Jiaotong University, 2011, 30(5): 149-151. (in Chinese).
- [36] YE QQ, LIU J, WANG XL. Relation of gratitude to attribution style and perceived social support in college students[J]. Chinese Mental Health Journal, 2012, 26(4): 315-318. (in Chinese).
- [37] Bertocci PA, Millard R. Impersonality and the good: Psychological and ethical perspectives[J]. New York: David Mc Kay, 1963, 21(3):74-79.
- [38] TANG J. Study on Shanghai urban disadvantaged women's group research of subjective well-being and its influencing factors [M]. Shanghai; East China Normal University,2002. (in Chinese).
- [39] ZHANG QL. A research on university students' subjective well-being after physical exercise[J]. Zhejiang Sport Science,2004, 26(1):93-96. (in Chinese).

(From page 30)

Reproduced with permission of copyright
owner. Further reproduction prohibited
without permission.