Chemical Quarterly 2012.Q2

Commercial Seed in China. Plow and Plant Today for Harvesting Tomorrow

China's commercial seed sector is attractive and promising, yet active Chinese players need to ramp up urgently R&D in biotech seeds to anticipate increasing penetration of foreign products despite high entry barriers.

In early 2012, the Chinese Government released its No. 1 Central Document, with a continued focus on agriculture. The government has underscored the importance of technological innovation to increase yield and provide sustainable growth in the agricultural sector. It has promised to increase financial support for agricultural R&D, while attracting venture capital and loans to enterprises pioneering in agricultural technology. Innovation in and maturation of the commercial seed industry is key to achieving the needed modernizations, and of all the agricultural sectors, the seed industry was singled out as the sector to lead the development of the agricultural industry.

Deloitte.
德勤

Growing market demand, with low penetration of biotech seeds

In the past, China relied on farm-saved seeds for agriculture, and even now, farm-saved seeds make up around 60% of the market. This is particularly high when compared with averages of 30% globally and 10% in developed nations in 2010. Commercial seeds are superior to farm-saved seeds in germination rate, yield, and output quality.

China's commercial seed demand has displayed signs of steady growth, with growth averaging 12% annually from 2005–2010, and reaching a market value of RMB 38 billion (Exhibit 1). This growth is driven by favorable government policy and subsidies; less use of farm-saved seed due to open trading; continuing price increases (hybrid rice seed prices up 24% from March 2009 through 2010); and increasing penetration of proprietary seed. These key drivers are expected to continue to propel the growth in demand for commercial seed in China.

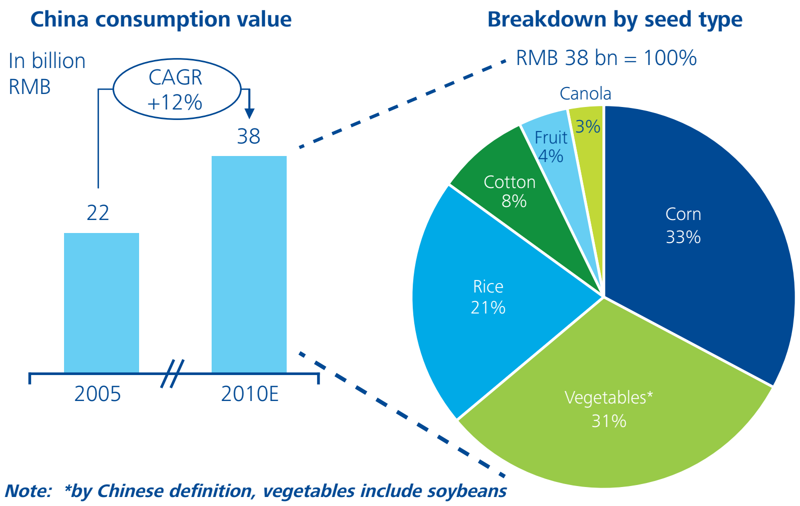
China commercial seed is mainly used for two crops—corn and rice, which together held over 50% of market value in 2010 (Exhibit 1). The ratio of commercial seed planting to overall production of corn is already 98%. This is due to widespread use of high-performance seeds from global players (e.g., DuPont Pioneer Hi-Bred hybrid corn and Monsanto DeKalb corn).

When compared with the global seed marketplace, domestic penetration of biotech seed is still very low; Biotech crops accounted for only 2.2% of the total planted crop area in China in 2010. Worldwide biotech seed demand is increasing more quickly than conventional seed demand, driven by input trait performance (i.e., herbicide tolerance, insect resistance, and stacked traits). Already 81% of soybeans, 64% of cotton, and 29% of corn planted globally are biotech, according to ISAAA. Biotech seeds still face great barriers to expansion in China. The public has voiced strong concerns about the safety of new seed types and boycotts have been threatened. The Ministry of Health requires crops that are transgenic to be labeled.

Biotech seeds have penetrated several segments. Seven GM (Genetically Modified) seed lines have been approved in China. According to the Chinese Academy of Agricultural Sciences (CAAS), 70% of cotton grown in China is transgenic. In addition, two transgenic rice seed lines have been certified safe for experimental field planting by the Ministry of Agriculture, although mass production and sales are still forbidden.

Looking forward, the Chinese government has announced policy and subsidy support for both conventional and biotech seeds (particularly for biotech corn, cotton, rice, and wheat). These policies support domestic R&D efforts, increased commercial seed use, industry integration, and improved seed trading. Starting 2008, government subsidy allocations for new GM breed development increased to a total of RMB 20 billion. Continued subsidies will accelerate biotech breeding activities in the seed sector.

Exhibit 1: Increasing demand in commercial seed in China



Note: *by Chinese definition, vegetables include soybeans

Source: International Seed Federation, broker reports, press release, Deloitte analysis

Highly fragmented industry with consolidation underway

China's commercial seed industry is much more fragmented than global, and dominated by small-to-medium-sized domestic players. There are about 8.7 thousand seed production companies and over 100 thousand seed distributors in China. The top 50 Chinese players had only a 40% market share in 2010, in which year the average revenue for the eight listed players was less than RMB 1 billion (Exhibit 2).

Globally, the commercial seed industry is fragmented, with the top three players having a combined market share of over 40%. Monsanto, DuPont, and Syngenta earned USD 7.6 billion, USD 5.4 billion, and USD 2.8 billion in seed revenue in 2010, respectively.

Two distinct models exist among leading seed players. In the "crop science firm" model, there are the "Six Innovators"—Monsanto, DuPont, Syngenta, Bayer, Dow, and BASF—large global companies that are primarily technology-driven, integrating both the bioscience (seed) and crop protection (pesticide) businesses. Of these, Monsanto, DuPont, and Syngenta are estimated to own 70% of all commercial traits globally. In the second model are "farmers' cooperatives," farmer-owned organizations designed to maximize benefits to their members. Two major examples are Groupe Limagrain in France and Land O'Lakes in the United States. These two cooperatives earned around USD 2 billion revenue in the seed business in 2010; have entered the GM seed market through M&A activities; and have forward-integrated into farming and food processing to streamline value chain activities.

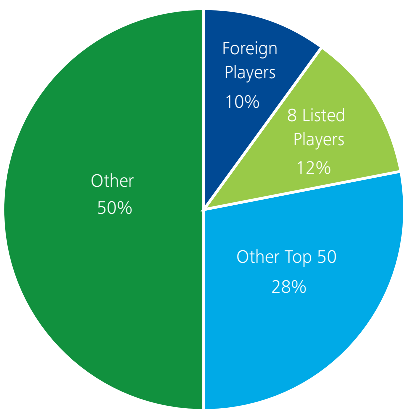
So far, Chinese companies have focused on conventional seed, and on mainstream food crops such as corn, rice, and wheat. Some leading players have increasingly expanded into other seed categories such as oilseed, vegetables, fruits, etc. (Exhibit 2). Chinese players currently control 90% of the market; and in response to the Ministry of Agriculture's promotion of consolidation in the seed industry, negotiations between major players have started and a trend towards increased domestic consolidation is expected to continue.

Not content with only a 10% market share in China, foreign seed players are increasingly leveraging sales agents (for imports) and JVs in China. Major global seed players have already entered the market, selling varieties of grain, vegetable, and fruit seeds, including GM seeds. They have set up JVs with Chinese

Exhibit 2: Highly fragmented seed supply structure in China

Market share by players

RMB 38 bn = 100%



Selected listed Chinese players

	Seed category					Comments
	Grains	Oilseed	Vegetables	Fruits	Others	
Longping Hi-tech 隆平高科	• Rice • Corn • Wheat	• Canola	• Chili epper • Eggplant • Cabbage	• Water-melon	• Cotton	• Started with rice • Strong in rice, corn • Limagrain owns ~10% share
Denghai Seed 登海种业	• Corn • Wheat		• Eggplant • Cabbage			• Started with and strong in corn • JV with DuPont Pioneer in corn
Fengle Seed 丰乐种业	• Rice • Corn • Wheat	• Canola • Sesame • Soybean	• Tomato • Eggplant • Cabbage	• Water-melon	• Cotton • Spices	• Started with rice • Leading in two-line hybrid rice & watermelon seed
Dunhuang Seed 敦煌种业	• Corn • Wheat • Rice		• Tomato	• Water-melon	• Cotton	• Strong in corn, cotton • JV with DuPont Pioneer in corn

Source: Press release, Ministry of Agriculture, CNSA, company annual reports, Deloitte analysis

Main products

companies to meet regulatory requirements (including a maximum 49% foreign share) in order to establish the necessary footprint. For instance, DuPont has two JVs with Denghai and Dunhuang, Monsanto has two JVs in cotton seed and one JV with China Seed (part of Sinochem), and Groupe Limagrain has acquired a 10% stake in Longping. The joint venture example of Denghai/DuPont Pioneer DP is highlighted in the sidebar.

In another measure, leading global seed players have established R&D centers in China and partnerships with Chinese research institutes to promote seeds through local R&D initiatives. Monsanto has set up a pilot village project in Hebei with the Ministry of Agriculture; DuPont has built corn seed R&D centers in Liaoning and Henan provinces; and Syngenta has not only fostered GM rice research with an Anhui Rice Research Institute, but also has two R&D centers in Beijing and Shandong.

R&D as the key lever for Chinese players to capture future value

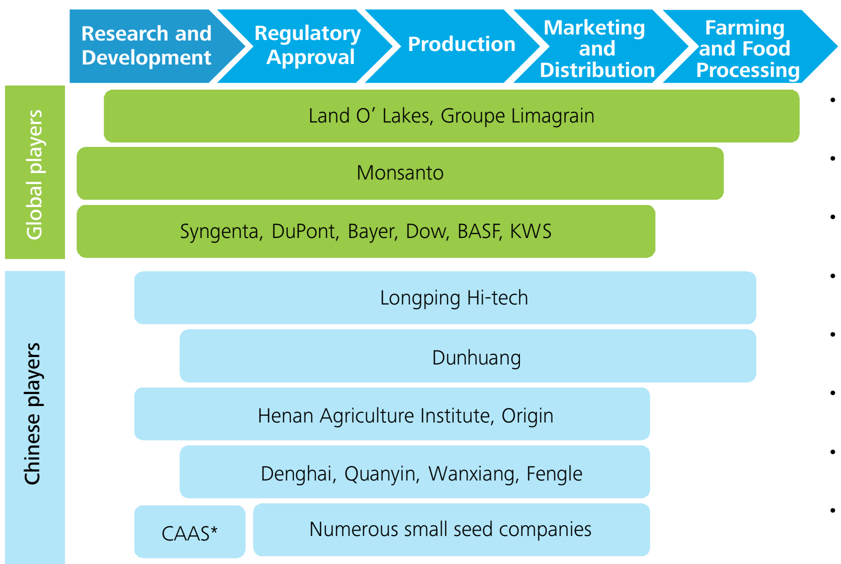
Globally, the biotech seed industry capitalizes on cross-licensing (leveraging multiple IPs on GM seeds to breed stacked traits) across leading seed players through coopetition. Examples among the Six Innovators include corn, soybeans, and canola between DuPont and Monsanto; corn and cotton between Syngenta and Dow; and corn, soybeans, cotton, canola and wheat between Monsanto and BASF. Monsanto has the central position in the cross-licensing network, as the only one that has agreements with all five of the others due to its R&D leadership in seed genetic engineering. Cross-licensing is expected to be the future trend as an alternative means of consolidation.

Denghai/DuPont Pioneer JV Case

Denghai has a corn seed joint venture with DuPont Pioneer, and holds 51% of the shares. Corn seed propagated with Pioneer technology is sold under the trade name "Xianyu."

- Uses differentiation, rather than low cost, to secure first-mover advantage
- Sells DuPont Pioneer Xianyu Corn seed and Denghai Corn seed through two separate sales and distribution channels
- Provides a high incentive to distributors to promote new products (e.g., distributors selling Super Corn receive high commissions)
- Has established a distribution network already covering 28 of China's provinces

Exhibit 3: Business models used by global and Chinese seed players

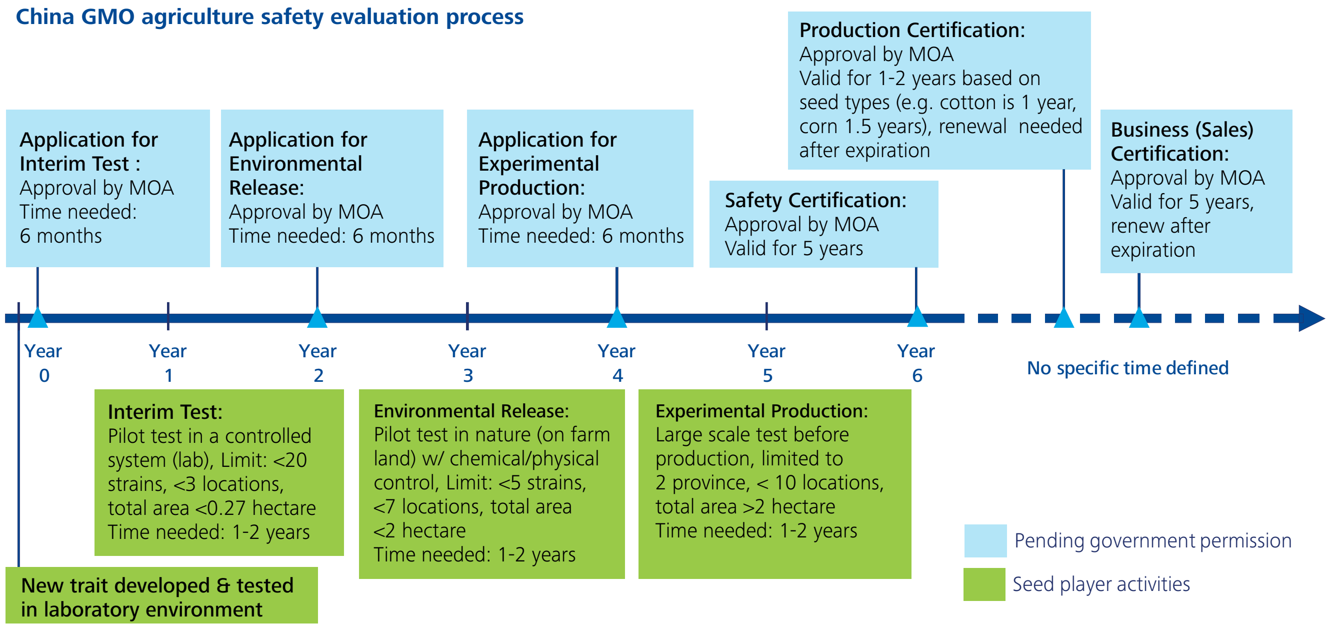


- Both are integrators from seed R&D (incl. GM seed) to food processing (e.g. cheese, etc.)
- Strong in biotech seed R&D and going downstream, e.g. via JV with Cargill
- Seed players with intensive R&D in biotech, many are multinational chemical companies
- Longping strong in hybrid rice, also selling grown cotton
- Dunhuang has JV with Pioneer for corn, expanding into tomato processing
- Henan Agri Inst. develops and sells seed, and Origin has started GM seed research
- Focus is on conventional seed business with R&D; Denghai has JV with Pioneer
- CAAS purely focuses on research; over 100k seed retailers exist in China

Source: Press release, company annual report, Deloitte analysis

Note: * China Academy of Agricultural Sciences

Exhibit 4: Long time-to-market for new biotech seed launch in China



Source: Ministry of Agriculture (MOA), Deloitte analysis

Global players are well-integrated along the seed value chain, from R&D to distribution (in the case of the Six Innovators) or further into farming and food processing (in the case of the farmers' cooperatives). (See Exhibit 3.) For example, Monsanto has teamed up with Cargill to develop corn processing technology to generate oil, ethanol, and animal feed. Global players invested heavily in R&D to maintain their technology leadership. In 2010, R&D expenses in proportion to annual revenue reached 15% for Syngenta and 10% for DuPont in their seed business.

Comparatively, Chinese seed firms are less integrated and much weaker in R&D, particularly for biotech seeds (Exhibit 3), Historically, Chinese players have emphasized production of conventional seeds, especially with a focus on grains (e.g., Longping on hybrid rice, Denghai on corn). Increasingly, Chinese players are ramping up R&D activities in GM seeds. Quanyin claims to have developed GM cotton seed. Fengle is co-developing GM rice with Chinese research institutes, and Origin is leading in GM corn.

Though much smaller than global seed players, leading Chinese players have established sizable business in the market; in 2010, Dunhuang earned revenue of RMB 1.59 billion, and Fengle earned revenue of RMB 1.5 billion. They show sound profitability as well (EBIT margins of around 10–22% according to financial disclosures in 2010). Chinese players who have joint ventures with foreign players tend to be even more profitable (e.g., EBIT margins of up to 42% for Denghai and 22% for Dunhuang, each of whom shares a JV with DuPont Pioneer).

Chinese players have benefited significantly from the JV arrangement, mainly from high-performance foreign seed products. In 2010, around 70% of Denghai's revenues were earned on sales of DuPont Pinoneer "Xianyu" corn seeds. Moving forward, Chinese players should begin now to prepare and better position themselves by investing more in research and development of biotech seeds, since the path from research to final product is a multi-year process, with many challenges in R&D, uncertainties en route to market, and regulations to anticipate (Exhibit 4).

About the authors

Yann Cohen is a Partner in Strategy & Operation of Deloitte Consulting based in the Shanghai office and National Industry Leader of Deloitte Chemicals in China. You may contact him at yanncohen@deloitte.com.cn.

Jiaming Li is an Associate Director in Strategy & Operation of Deloitte Consulting based in the Shanghai office and core team member of Deloitte Chemicals in China. You may contact him at jiamli@deloitte.com.cn.

Acknowledgements

The authors would like to thank Tracy Wang, Lydia Chen, Natalie Baer and William Hillis for their contributions in editing, review and design of this Deloitte Chemical Quarterly report.

About Deloitte Chemical

Deloitte is one of the world's largest professional services providers, offering a full range of advisory services (Audit, Tax, Consulting, and Financial Advisory Services) with an independent view.

Deloitte has developed fruitful and longstanding relationships with clients among the leading companies in the Chemical sector (69% of the Top 100 global chemical producers and 70% of the Top 10 chemical players in China).

Combining global reach and deep industry knowledge, our Deloitte Chemical team provides a wide range of advisory services (Strategy, Operation, Merger & Acquisition, Risk, etc.) in the Chemical sector, across numerous business segments covering material, crop & environmental sciences.

For more information, please visit us at www.deloitte.com.cn.

SH-023ENG-12