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Ministry of Agriculture's Domestic Corn Policy

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Approved By:

Scott Sindelar

Prepared By:

Joshua Emmanuel Lagos and Jiang Junyang

Report Highlights:

On May 26, 2012, an article written by the Ministry of Agriculture Minister Han Changfu stated that China plans to increase corn production through policy and technology support to meet surging domestic demand. He further noted that corn should not become the second soybean, an inference that might mean that China should not become dependent on foreign suppliers to meet its corn needs. The article was published in the newspaper called the People's Daily, a mouthpiece of China's Communist Party and government.

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Unofficial translation begins.

A Brief Study of Corn

On Sixth Page of People's Daily, May 26, 2012

By Han Changfu, Minister of MOA

Corn is the grain crop with the broadest acreage and the largest output in the world, ranking the first of three major grains (corn, wheat and rice). China is just second to the United States (and in the world) in terms of sown area, gross output, and consumption. In recent years, the momentum of development in corn in our country has been very good, maintaining a balanced pattern between production and demand on the whole. But the annual fluctuations of output vary greatly. With the rapid development of industrialization, urbanization, and the rise of living standards, corn consumption in China has entered a stage of rapid growth. In China, corn has the fastest-growing demand, but also has the largest potential for yield increases. By grasping how to improve corn production, we will grasp the key to improve the sustainable development of grains. An important task to ensure national grain security includes increasing corn potential productivity, speeding up the development in corn, and maintaining basic self-sufficiency in corn.

I. Strategic position of corn in grain security

(1) Corn is the largest grain in the world. At present, apart from Antarctica, corn is planted in more than 70 countries on all the continents of the world. According to FAO statistics, in 2010/2011, global corn production was 840 million tons, accounting for 35% of global grain production. The trading volume was about one-third of total world grain trade. Corn is the most widely used grain crop. Being very nutritious, corn can be called the "King of the five cereals." The kernels contain 73% starch, 8.5% protein, and 4.3% fat, and are rich in vitamins. Corn is used as food, feed, and industrial raw materials.

At present, one-third of the world's population lives on corn as a staple food. Corn has been recognized as the King of feed, and its kernel, stems, and leaves are high quality feed ingredients. 70% to 75% of corn is consumed as feedstuff in countries with a developed animal husbandry industry. Corn is also an important industrial raw material. Among grains, corn could be processed into the largest amount of product varieties with the longest processing chain and the highest increment in value. Further processed products total more than 2000 varieties.

(2) In China, corn now has the largest planted area of all the grain crops. Presently, corn is produced from the east, such as Taiwan and coastal provinces, to the West such as Qinghai-Tibet plateau and Xinjiang, from Hainan Province in the South, and to Heihe area in Heilongjiang province in the North. China is the only country that can plant corn in "four seasons" in the world. Spring corn and summer corn dominant Chinese production. Since the founding of new China, Chinese corn production has been increasingly highlighted in our country. The national percentage of corn planted area and the corn production has risen from 11.3% and 10.7% in the 1950s to 20.4% and 23.4% in the 1990s. In the 21st century, the leap-forward development of corn production has been achieved in China. In 2011 the corn planted area reached 500 million mu, and production reached 385.6 billion half kilos, accounting for 33.7% of total grain output. From 2004-2011, the grain production in China realized "eight successive increases," with a total increase of 281 billion half kilos, of which the corn increased by 153.9 billion half kilos, accounting for 55% of total increase.

(3) Corn will see the fastest growth in demand of all the grains in China in the future. And the demand comes from two main areas: 1) the rapid development of animal husbandry will increase corn demand; and 2) deep processing of corn. Regarding the increase in corn demand, international experiences have shown that, when entering a middle phase of industrialization and urbanization, a significant change in the dietary structure will occur among the people, resulting in a significant increase in the consumption of meat, eggs, and milk. For example, from 1965 to 2000 the average annual increase of corn feed consumption in the United States was 1.6%, and in Japan was 4.1%. China has entered this middle phase, and therefore the corn feed consumption has increased and accelerated. In 2010, the national output of meats, eggs, milk, and aquatic products increased respectively by 23%, 18.5%, 105% and 31.8% compared with 2003. At the same period, the consumption of corn for feed increased from 180 billion half kilos to 240 billion half kilos, up by 33%. The rapid development of

intensive farming of livestock and poultry has changed the type of feeds that were traditionally used.

Household farms that used to feed pigs with green fodders, rice bran and wheat bran and leftovers now use more industrial feedstuffs, which have significantly increased the demand for corn.

The rapid development of deep processing has increased the demand for corn. Prior to 2000, the deep processing for annual corn consumption in China was less than 20 billion half kilos, accounting for less than 10% of corn consumption. With the rapid expansion of the production capacity for corn deep processing industry, it is likely to further increase from the current 180 billion half kilos. According to expert analysis, the period of the "12th Five -Year Plan" would be an important period when China's corn supply and demand situation could be undergoing profound changes. It is expected that the total consumption demand for corn in China will be about 440 billion half kilos by the end of the "12th Five -Year Plan," where demand will outweigh available supplies, and even create situations where output is insufficient to meet demand in individual years. Strong consumption growth in the last two years is the main reason why Chinese corn prices have risen.

II. “One major outstanding problem, two major areas for development, and three major restraining factors” encountered with corn production in China

(1) At present, the foremost problem in corn production is the lack of stable corn production and large annual fluctuations in output. For many years, corn is not only an important contributor to the rise in total grain production in China, but also has caused fluctuations in grain output. The increase or decrease of wheat and rice output is mainly due to the change in area. The increase or decrease of corn output is mainly due to yield changes. The biggest threat to grain production in China is drought, and corn is most vulnerable to drought, which results in reduced yields. Since 2000, the national corn yield has increased and decreased. It decreased by 12.6% in 2000, 2.3% in 2003, 3% in 2007, and 5.3% in 2009. In 2000, the national reduction in total grain output (92.4 billion half kilos) was due to severe drought. During that year, corn production decreased by 44.2 billion half kilos, accounting for 48% of the total decrease. Severe drought in the Northeast caused even greater output fluctuation. For example, in 2000 the reduction in corn output was 34.3 billion half kilos, accounting for 77.6% of the drop in total corn production.

(2) Two areas for corn development in China: 1) corn yields and 2) expanding area. The record corn yield in the United States was 1,850 kilograms/mu. The record corn yield has reached 1,356 kg/mu in Xinjiang, China. In 2011, the highest corn yield occurred in China, but the national average corn yield was only 383 kg/mu. Compared with other main corn producing countries, China's corn yield is low, ranking 21st in the world. The average corn yield is more than 600 kg/mu in developed countries such as the United States. The levels of the corn yield among China's provinces vary considerably. Summer corn producing areas in the Huang-Huai-Hai region are not the same. For example, in Shandong the corn yield is 436 kg/mu, or 66 kg/mu higher than that in Henan province, 102 kg/mu higher than in Hebei province, and 162 kg/mu higher than in Anhui. In the Northeast, or the spring corn producing region, the Jilin corn yield is 439 kg/mu, 72 kg/mu higher than in Liaoning, and 84 kg/mu higher than in Heilongjiang. At present, generally speaking, Chinese corn planting density is lower than other countries. On average China's corn planting density is about 3,500 plants per mu, while in the United States it averages 5,000 plants per mu. According to expert analysis, if China's corn planting density increased to 5,000 plants per mu, together with the corresponding technical measures, China's corn yield may increase by more than 50 kg/mu.

Area expansion is also important. In northeast China, the corn planted area can be expanded through the promotion of drought resistant sowing techniques, no longer continuing the practice of just growing soybeans in traditional soybean areas, rotating soybeans with corn, and other measures. In order to increase the area, in the Huang-Huai-Hai region, less interplanting and more flat planting¹; in southwest China more interplanting and under-crop sowing², in northwest China promoting entire membrane double ridges trench sowing technology³ and to increase autumn crops instead of summer crops, and in southern China utilizing fallow land during the winter. According to expert estimates, if these measures are undertaken, by 2020 China's corn acreage could reach 550 million mu, which is a 50 million mu increase from present corn acreage.

(3) Three major restraining factors for Chinese corn production: 1) corn production is concentrated in relatively low yielding fields that can be affected by drought; 2) low mechanization and less use of

¹ Completely clearing the ground of leftover corn stalks, stover, and other post harvest debris before planting

² Interplanting crops at different timing intervals based on climate and weather patterns

³ Plastic film placed on 2 rows

more practical technique in corn production; and 3) the development of the seed industry is backward, with not much development of quality varieties. The practical technology to meet the different regions and different production conditions in China is not only in acute shortage, but the adoption rate is not high. Use of mechanization is also low, with mechanized harvest only at 33% of total production. For many years, Chinese farmers have used small machinery for that does not plough the soil very deep, and can limit production potential. According to an expert survey, the average Chinese depth for a ploughed field is 16.5 cm, less than 5.5 cm of the shallowest depth for optimal corn growth, and less than 18.5 cm in depth compared to that in the United States. While the number of domestic maize varieties is very large, the level of original inbred lines is very low. As a result, developing improved varieties is becoming a very serious problem. High yield, good quality, multiple resistant, widely adaptable varieties (can be planted in more than one province or region) are relatively small in number. Compared to foreign varieties, most Chinese corn varieties are not suitable for high planting density and the use of machinery. The corn germination rate and vigor (reflects the corn seed vitality) are relatively low.

III. General ideas for promoting the sustained and stable development of China's corn industry

In China's grain security strategy, corn must be placed in a more prominent position. Comprehensive arrangements should be given to the development of major grain crops such as corn, wheat, and rice. In order to increase corn area (as well as ensure it does not fluctuate), we must strengthen infrastructure construction, speed up technological innovation, optimize the layout of the regions and varieties, make great efforts to increase the unit output level, and constantly enhance the comprehensive productivity of corn. We must raise the levels of scientific storage and transportation and the processing efficiency, perfect policy adjustment and the regulation system, promote corn industrialization and market competitiveness, promote the sustained and stable development of the corn industry, maintain basic domestic self-sufficiency, and ensure national grain security. To achieve the above objectives, we must focus on the following areas:

(1) The general principle for the development of China's corn industry should be based on achieving basic self-sufficiency. China is both a large producer of corn, as well as a large consumer. We must rely on domestic resources and ensure the stable development of corn production in China to meet increasing consumer demand. Since Chinese corn demand is large, relying on imports (due to international market variables) does not resolve the problem of China's fast-growing demand for corn.

At present, the annual trading volume of corn in the world is around 180 billion half kilos in the international market, which accounts for 55% of China's annual consumption of corn. Major corn exporting countries are United States, Brazil, and Argentina. If an exporting country suffers from major natural disasters or adjusts their trade policies, Chinese corn imports could be at risk. Therefore, we must firmly take the initiative of developing our corn industry. We must be in charge of maintaining a balance of corn supply and demand; and resolutely prevent Chinese corn from becoming the "second soybean."

(2) We need to utilize new production methods to increase corn production. At present, the corn production in China is relatively backward. In the United States, the corn production has realized large-scale specialized production, mechanized operations, and precision management. One U.S. family farm plants more than 2,600 mu. U.S. land productivity, labor productivity, and intensive management has reached a very high level. China has a large population with less farmland, and this means that China cannot completely copy the United States model, but can learn from its practice. We should quickly begin using new methods for corn production, improve the condition of material equipment, and rely on scientific and technological progress and improvement of the quality of the labor force, and promote the comprehensive productivity of corn as soon as possible. We must innovate the mechanism and system for agricultural operation and management, improve the mechanism for transferring land, guide the farmers to make efforts to develop the corn production cooperatives and large grain production households on the principles of voluntariness and compensation according to the law, and increase the scale of corn production and the level of professionalism, organization, and standardization.

(3) Optimize the regional distribution of corn production. The trend in modern global agricultural development includes better utilizing land for certain crops over others. The corn planted area along the corn belt in the United States accounts for 80% of production. In recent years, China has begun optimizing land areas where are more advantageous for corn production. The next step is to further optimize regional distribution, adjust measures to local conditions, consolidate the advantageous areas, and upgrade the potential areas. We must highlight key measures and promote the modernization of corn production in the advantageous areas. The best corn growing areas in our country mainly consist of spring corn areas in the north, summer corn areas in Huang-Huai-Hai region, mountain areas in the southwest, and dry land area in the northwest. We should continue promoting corn production in

advantageous areas, and make efforts to build up 4 major advantageous areas.

(4) Increasing support helps promote a sustained and stable development of corn. Since 2000, the Chinese central government has introduced a series of policy measures to support grains and corn production. Some local governments have also supported subsidy policies, which have been used to control plant diseases and insect pests for corn, and promote plastic film mulch and quality seed. These policies and measures have played an important role for promoting the stable development of corn. But the overall competitiveness of the corn industry in China is not strong, therefore, we should speed up the strategy planning and industrial policy for the development of the corn industry, including implementing a program to improve lower quality farmland (despite drought or excessive rain) and substantially increase investment. Various measures such as technology subsidies and price support should be taken in support of corn production aimed at the weak links of the corn varieties, technology promotion, and agricultural mechanization in China.

IV. Main technical and policy measures to increase corn production

Strengthening the comprehensive productive capacity of corn and making efforts to increase corn production is the key to ensuring the sustained and stable development of the corn industry. Various measures should be taken to simultaneously tackle the weak links, break through the key constraints, and highlight the key areas. Great efforts should be made in the following six aspects:

(1) Promoting the research, development, and utilization of improved seed varieties. Ensure the quantity, quality and variety security of the seeds by strengthening the innovation of science and technology in the seed industry. We should accelerate the cultivation of new varieties of corn. Through the introduction, exploring, and innovative utilization of corn germplasm resources, great efforts should be made to cultivate new varieties which feature disease resilience, high yields, high quality, and are suitable for high density planting and mechanized operations. We will continue organizing and implementing important and special projects for biotech seed breeding and cultivating new varieties. We will actively and steadily promote the research and development and application of biotech corn and make a good job of strategic technology reserve. We will build a national seed production bases in the Northwest and Southwest, as well as Hainan Province, and improve the comprehensive productive

capacity of corn seeds. We will build strategic alliances, speed up commercial breeding mechanisms with enterprises as the main players, encourage large-scale enterprises to enter the seed industry through mergers and acquisitions, equity participation, and other methods, encourage research academies, institutes, and scientific researchers in colleges and universities to cooperate with enterprises, and cultivate a group of large integrated leading enterprises in breeding, propagating and promoting/distribution.

(2) Great efforts should be made to solve the problem of drought. We must vigorously strengthen the construction of water conservancy facilities, reconstruct medium and low yield land, and continually enhance China's capacity to disaster prevention and mitigation. In addition to moderately utilizing surface water and groundwater, we should mainly rely on approaches to develop water-saving and high-efficient agriculture. Especially in the Northeast and in Huang-Huai-Hai region, deep ploughing should be promoted. In production areas of around 300 million mu, deep ploughing can be conducted every three years, which generally should result in a production increase of 5% to 10% over the previous year. Film mulch planting can effectively solve spring drought problems in the northwest, southwest, and western areas of the northeast, and can generally increase output by approximately 250 half kilos per mu. Drip irrigation can help combat spring, summer, and autumn drought in the western areas in the northeast, resulting in increased production of 500 half kilos per mu. This could also be promoted on around 60 million mu in the northeast. In addition, spray irrigation can be promoted in flat topographical areas that are suitable for large scale farms and have good water sources. Investment should be increased to encourage the use of water-saving and high-efficient technologies.

(3) Actively promote mechanization. We should vigorously promote mechanized soil preparation and precision seeding for corn production, and should combine agricultural machinery with other agricultural techniques. Developing the mechanized harvesting of corn should become the core goal to further promote corn production mechanization. We need to organize and conduct research for key corn harvest technologies and machineries, better use mechanized harvest to take full opportunity of the farming season, reduce losses, and solve problems of high costs and time that is currently expended on the corn harvest. Efforts should be made to increase policy support. Priority subsidies should be given to mechanized corn harvesters, straw returning machine, and no-tillage corn planters. We need to increase the subsidy for deep tillage and soil preparation machinery in main corn producing areas.

(4) Make efforts to reduce loss after harvest. In our country, the storage of corn is mainly conducted by farmers, which causes substantial losses due to farmers' poor grain storage facilities. According to expert estimates, post corn harvest loss in storage is more than 5% every year in China, totally about 20 billion half kilos. In recent years, the central government has implemented "the special project for scientific granary of farmers" to grant subsidies for farmers to built "natural-dry granaries," which may reduce the loss rate to 2%. We should firmly establish the thinking that reducing loss means to increase production, increase the intensity of project implementation, and promote the storage of grains in a safe and scientific manner. At the same time, in sectors of purchasing, storage, and transport, we should strengthen the construction of warehouse and logistics facilities, speed up the maintenance and renovation of the old and aging warehouses and barns, and minimize loss arising from the transfer of products to different storage units.

(5) Policy regulation should protect the farmers' enthusiasm. In recent years, the Chinese government has started a temporary policy for corn purchasing and storage, which has played an important role to stabilize corn prices, maintain a reasonable income for farmers to plant grains (which guarantees the corn sown area). For the future, this policy measure should continue to be implemented and gradually improved; and we should gradually increase the prices for provisional purchasing and storage, taking into consideration the price relationship, production costs, and farmers' income. We should study how to extend policy coverage, expanding gradually from the four provinces in the northeast which includes Inner Mongolia to north China and northwest China. At the same time, in order to promote the sustained and stable development of corn industry, we should insist on doing well in corn processing and the regulation and control of corn import and export. At the prospect of the entire industry chain, we should develop corn deep processing in a moderate manner, improve the comprehensive benefits of corn, and encourage farmers to increase output (which also should positively affect their income). While guiding the corn processing industry to develop in a healthy and orderly way, we should encourage the development of the processing industries used for feed, food, and pharmaceutical products, and strictly control energy and chemical processing industries. We should consider the timing and pace of imports to avoid the impact on domestic production or dampening farmers' enthusiasm.

In short, to promote the sustainable increase of corn production, success depends on the progress of science and technology, which should focus on increasing yields and drought-resistance. Our approach should also focus on seed varieties, technology and engineering, and policy support. As long as these policies and measures are truly integrated, the corn industry in China will be sure to develop in a sustainable and stable way.

Unofficial translation ends.