China shifting GM policy to grow more corn, soybean

January 18 2022

From being an importer of soybean and corn, China is now gearing up to produce GM varieties of these crops to meet growing demands in the country. Credit: Melquizedeque Melqui from Pixabay

China's status as the world's largest importer of soybean and corn for animal feed is expected to change once it approves new regulations to allow the planting of genetically modified (GM) seeds which will boost domestic production of these crops. This may free up millions of metric

tons of these crops for other countries to import as feed for their animal industries, affecting global market supplies and prices.

In 2021, China imported 100 million metric tons of soybean and 27 million metric tons of corn, mainly for animal feed, to grow hogs, chicken and fish. China's domestic feed production, which uses conventional non-GM varieties, cannot keep up with demand from a growing middle-class for more meat. China currently imports GM corn and soybean but disallows the planting of GM food and feed crops.

Adoption of GM corn and soybean is likely to increase average yields, possibly by as much as 50 percent, effectively reducing China's demand for large volumes of these two feeds.

Any reduction in corn or soybean imports by China means that millions more metric tons will be available for other importing countries like those in South-East Asia and many other developing countries. This may have cascading effects on grain prices.

On the other hand, it may also lead farmers in the exporting countries to reduce production to avoid a major drop in prices. With uncertain weather patterns, the world could face increased vulnerability from reduced stocks of corn and soybean for trade.

China's growing appetite

China's demand for feed grains reflects its growing appetite for animal protein and changing diets, brought on by higher living standards and increasing household incomes. The country has recently established targets to produce 95 percent of the protein domestically by 2025, which includes plans for 85 percent self-sufficiency for beef and mutton, and 70 percent self-sufficiency for dairy.

Although China is the world's largest grower of corn by area, total grain production falls short of its needs. China reportedly grew corn on about 43 million hectares in the last growing season, producing an estimated 270 million metric tons. Yet, it had to import about 27 million metric tons of corn during 2021.

China's corn imports are about 1.5 times more than the second largest importer, Mexico, and 2.3 times, 6.6 times and 67.1 times more than the imports of Vietnam, Malaysia and Thailand respectively. Most of China's corn imports are from the US, Argentina, Brazil and Ukraine.

China is also the world's largest importer of soybean, importing more than six times the tonnage imported by the second largest importer, the EU, and about 28 times the amount imported by the largest ASEAN importer, Thailand. The main soybean exporting countries are Argentina, Brazil, Paraguay and the US.

One reason why these countries have surpluses to export is their relatively high yields per hectare. In the US, the average on-farm yield of corn is 11–12 metric tons per hectare compared to China's average corn yield of 6.2 metric tons per hectare. Likewise, the average yield for soybean in the US is about 3.5 metric tons per hectare while it's 1.6 metric tons per hectare in China. US farmers rely more on agritech and biotech for production of these crops.

Role of biotechnology

Data from the Food and Agriculture Organization of the United Nations shows that corn and soybean yields in China are about half of those of many exporting countries in the Americas. To close this gap, Chinese scientists have advocated the use of new technologies, including biotechnology, to produce improved seeds, such as GM seeds.

To support such efforts, the Chinese ministry of agriculture and rural affairs has been formulating a biosafety regulatory framework. In late 2021, the proposed changes to GM regulations were made public alongside a call for public feedback. The move came amidst remarks made by President Xi Jinping at a recent State Council (China's cabinet) meeting and the Central Rural Work Conference where he emphasized achieving food security and self-sufficiency through increased grain yields and agricultural production.

There has been speculation that the delays in developing and approving GM seed regulations may be linked to China wanting to develop its own high-tech seed industry through a "build or buy" approach. This is exemplified by the emergence of companies like Beijing Dabeinong Technology Group Co. and Shandong Denghai Seed and the purchase by ChemChina of Syngenta, one of the world's biggest seed companies.

In anticipation, several local seed companies are already at advanced stages of GM seed production. One company reportedly has estimated that China could plant 33 million hectares with GM corn.

The new GM seed regulations are anticipated to be approved in time for local seed companies to ramp up their regulatory approval, breeding and seed production activities for the 2023 growing season.

Future forward

Animal meat security is key to overall food security in China. The 2021 rural policy blueprint published by the State Council placed greater emphasis on food security than previously, calling for all provinces to improve grain yields during the 2021–2025 period. It also urged the "industrial application of biological breeding," which includes GM crops, among others.

Food security is a key political imperative for China's government and has been publicly linked to national security by President Xi. The key to food security is seeds, which the minister of agriculture and rural affairs called "the 'computer chips' of agriculture."

Going forward, the revised biosafety regulatory framework may just be a precursor to more advanced applications of biotechnology to produce higher yielding, less resource-intensive, climate-smart seeds. Will more technologically advanced agriculture make China a potential exporter of corn and soybean and push prices lower much like what they did to many manufacturing goods? Ultimately, consumers in developing countries with weak purchasing power are the main winners if meat prices become more stable and affordable in their domestic markets.

Provided by SciDev.Net

Citation: China shifting GM policy to grow more corn, soybean (2022, January 18) retrieved 26 April 2024 from https://phys.org/news/2022-01-china-shifting-gm-policy-corn.html

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