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China's "Catchup" on Growing Genetically Modified Crops

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SYNOPSIS

China, the world's largest importer of corn and soybean, seems finally to accept the potential of using genetically modified (GM) feed crops. Will this be enough to reduce China's dependency on such imports and will it meet the demands of other countries that are also experiencing an increase in demand for feed to increase production of animal meat?

COMMENTARY

Asia's enormous appetite for meat has fuelled an equally large demand for animal feed, notably corn and soybean. Three countries which are regularly large exporters of feed corn and feed soybean – the United States (US), Argentina, and Brazil – have invested in GM technology and grown GM feed crops competitively, despite increasing evidence of safety risks to humans, animals and the environment, and despite concerns from groups opposing GM technology. China is among the last of the major agricultural countries not to plant genetically modified crops.

Most scientific studies point to increased meat demand in Asia as this region has not seen "peak consumption" of meat yet. As such, competition for feed crops will intensify in the coming years, with supply likely threatened by geopolitical and environmental factors as the world's food security enters an era of what we would refer to as "volatile deficits", in which the stability of food security is not assured, and countries will have to be better prepared to deal with uncertainty.

In China, one of the world's most populous countries, increased meat demands from a rapidly growing middle-class mean that China will remain an important influence on the purchase of surplus corn and soybean grains on the world market.

In response to food insecurity concerns, particularly for animal feed, Beijing is considering the adoption of GM technology, starting with GM corn, which could decrease China's demand on global supplies. As this could free up quantities for other corn-hungry countries, China's adoption of GM technology may influence trade dynamics as well as the livelihoods of corn growers in exporting countries and smallholder corn farmers in developing countries.

Appetite for Meat

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. Meat consumption in China has steadily increased in recent decades, with the country having become the world's largest meat producer, consumer, and importer.

In 2021, the country consumed almost 100 million metric tonnes of meat – 27 per cent of the world's total – including 57 million tonnes of pork, 25 million metric tonnes of poultry, and 9 million metric tonnes of beef. And demand is expected to continue to rise. The country has recently established targets to produce 95 per cent of the protein domestically by 2025, including 85 per cent self-sufficiency for beef and mutton, and 70 per cent self-sufficiency for dairy.

Demand for Animal Feed

In 2021, China imported 100 million metric tonnes of soybean and 27 million metric tonnes of corn, mainly to grow hogs, chicken, and fish. China's domestic feed production, which uses conventional non-GM varieties, cannot keep up with domestic demand. To supplement local output, China currently imports GM corn and soybean but disallows the planting of GM food and feed crops in its territory.

Despite being the world's largest grower of corn by acreage, China's 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 tonnes. Yet, it had to import 27 million tonnes of corn during 2021 from the US, Argentina, and Brazil. China is also the world's largest importer of soybean, importing more than six times the tonnage imported by the second largest importer, the European Union.

One reason why some 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 tonnes per hectare compared to China's average corn yield of 6.2 tonnes per hectare. Likewise, the average yield for soybean in the US is about 3.5 tonnes per hectare while it is 1.6 tonnes per hectare in China. US farmers rely more on agricultural technologies (agritech) and biotechnologies for production of these crops.

Growing GM Animal Feed Crops for the First Time

Despite having studied GM food crops for decades, Beijing has never permitted them to be planted due to domestic opposition to the technology, although it allows imported GM soybean and corn for use in animal feed and the planting of GMO cotton.

Beijing recently approved the planting of GM corn for the 2023 planting season, although GM land area will likely account for less than 1 per cent of the total corn acreage. The agriculture ministry has designated around 4 million *mu* (267,000 hectares) to be planted with GM corn this year, with several varieties being planted in certain counties of Inner Mongolia, Jilin, Hebei, and Yunnan provinces.

This is one of a number of moves in recent years which suggest that Beijing is closer to recognising the value of biotechnology crops. Earlier, in January 2022, China published new guidelines for the approval of gene-edited plants. This came amid a raft of measures to overhaul China's seed industry, which is now seen as a weak link in biotechnology crop production. China's Minister of Agriculture and Rural Affairs, Tang Renjian, has likened seeds to the "computer chips" of agriculture.

Long-Term Prospects

A Chinese idiom holds that "people regard food as their heaven" (民以食为天). This saying reflects the importance of food security in China. For thousands of years, food security has been a key priority for the Chinese authorities and remains so today.

China's foray into GM crops must be viewed in the context of assuring national food security and avoiding reliance on foreign sources of means for food production, including seeds, fertilisers, and technologies. President Xi Jinping has repeatedly spoken in public of the importance of agricultural technologies and the seed sector in China, emphasising that, "To ensure that China's seed resources are self-supporting and under better control, self-reliance must be achieved in seed technology".

However, the many problems faced by China, including especially poor soil health, polluted fresh water, and limited arable land, will mean that many years could pass before the desired results are achieved. China will need to continue relying on grain imports if domestic production fails to meet demand, or if production costs become too high, or if overseas supply becomes cheaper again.

Ultimately, China's foray into GM crops is likely to have a positive impact on its own domestic needs for more corn (and soybean when it comes to this), while also making more corn (and soybean) available for other importing countries. This will be a boon to both consumers and producers.

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