



Farmers sow in a paddy field in Wuchang, Heilongjiang Province. In China, the fertile soil is a product of the region's geography and its special history. *Photographer: Xiaolu Chu/Getty Images*

Green | Climate Adaptation

The Rich, Black Soil That Fed a Growing China Is Washing Away

A Mao-era campaign to end famine tapped the country's most fertile land. Now President Xi Jinping is trying to protect what's left.

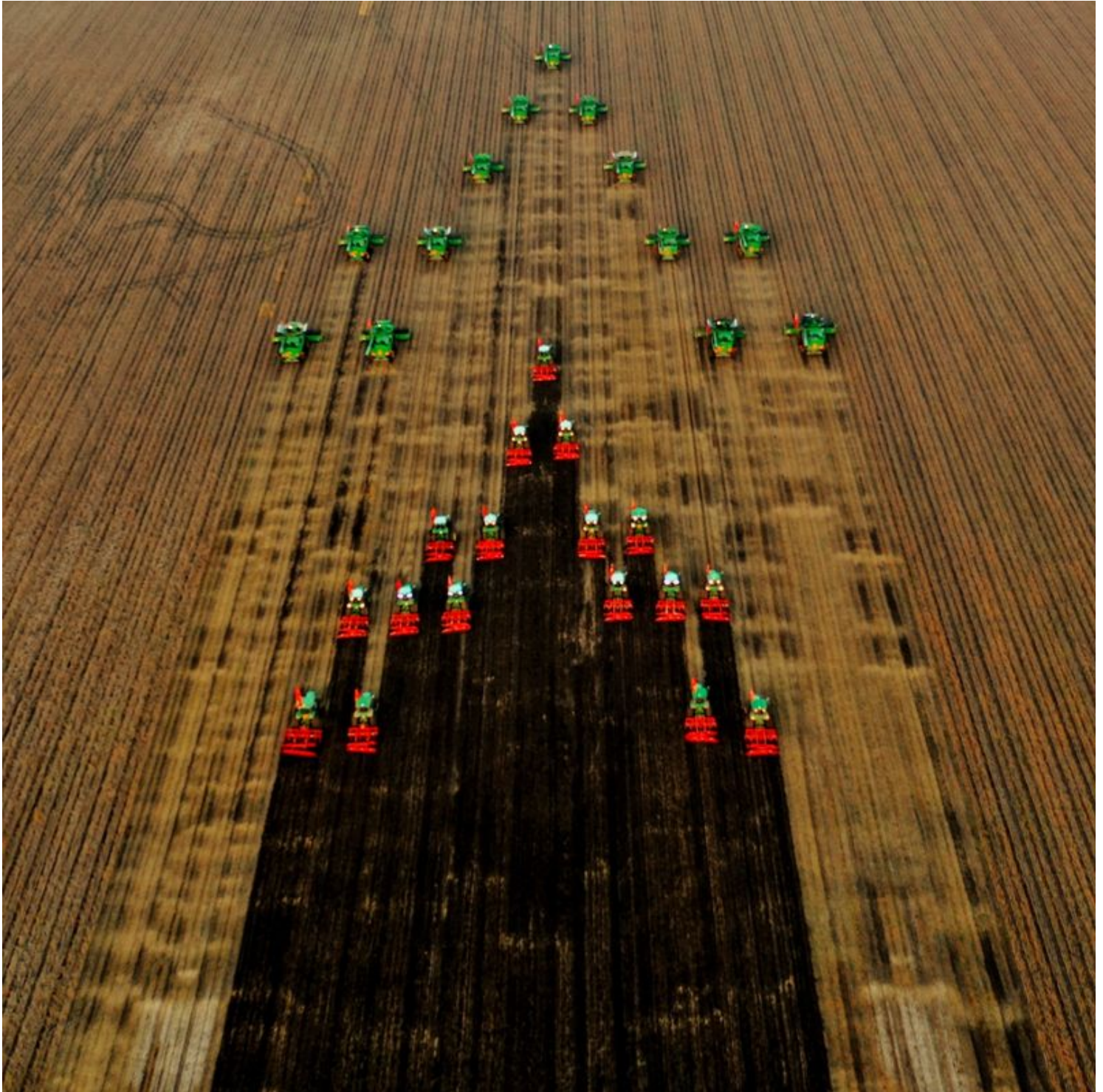
Bloomberg News

April 23, 2022, 8:00 AM GMT+8

In one of his first actions as Supreme Leader, Chairman Mao Zedong sent tens of thousands of soldiers and educated youth into China's northeastern provinces with a mission: raze the forests and replace them with houses and farms, cultivating a granary that would nourish a billion people for decades.

The campaign was a success. The black soil region became critical to feeding the growing population, and in the following decades, the demand for arable land also grew. In the ten years from 1990 to 2000, for example, the three provinces of northeast China added 2 million hectares of farmland, and today, the northeast region generates as much as 50% of China's japonica rice crop, 41% of its soybeans and 34% of its corn.

But the expansion of farmland has come at the expense of millions of hectares of forest, grassland and wetlands, and the increasing exposure to wind and rain has led to erosion. In the 1950s, the soil was so rich “a pair of chopsticks would sprout in it,” locals said. Now the organic matter in the soil has fallen by as much as 75%, and in some areas, the black soil layer is decreasing by 1 to 2 millimeters a year.



Soybeans being harvested at a farm in Heihe, Heilongjiang Province, in 2020. *Photographer: Wu Shujiang/VCG/Getty Images*

Researchers at the Chinese Academy of Sciences estimate that soybean production will fall by 40% to 60% and corn would barely grow in the region if – in the most extreme scenario – all its black soil is stripped away, no matter how much fertilizer is used.

Against the backdrop of climate change, global trade disputes and, now, Russia's invasion of Ukraine, Beijing has intensified its focus on food security, including efforts to protect the country's most precious soil. By 2025, China plans to improve the organic matter in nearly 6.7 million hectares of black soil by 10%. It's a good start, but would still be well below the levels enjoyed in the 1950s.

Black soil exists in only a few places in the world – in central Eurasia and especially Ukraine, and in the Red River Valley in the U.S. and Canada – and it's so potent that occasionally criminals are busted for black-market trafficking in the stuff.

In China, the fertile soil is a product of the region's geography and its special history. Long, cold winters slow microbial decomposition, preserving much of the organic matter in the soil. And during the Qing Dynasty, the ruling Manchus fiercely protected their native regions, allowing the layer of black soil to grow undisturbed.



A farmer sets working route for an unmanned transplanter in a smart agriculture demonstration zone in Heilongjiang Province, in May 2021. *Photographer: Zhang Tao/Xinhua News Agency/Getty Images*

“China has always put a lot of effort into safeguarding food security,” said Lam Hon-Ming, professor at the School of Life Sciences at the Chinese University of Hong Kong. “In the past most of the efforts were to increase food productivity to feed everybody, now it is more aware of sustainability and protecting the whole ecosystem for agriculture, including protection of the soil.”

One of the most common ways to preserve the soil is to return organic waste to farmlands to maintain soil moisture, improve fertility and prevent erosion from wind and water. Experts based in Lishu in Jilin province have been going door-to-door to try to persuade farmers not to burn or clean up the leftover stalks and leaves, as has been the local tradition.

Global warming makes the situation worse. Average temperatures are nearly 2 degrees Celsius higher in China’s black soil region today than they were 50 years ago, a difference large enough to speed up the decomposition in the soil’s organic matter faster. Extreme weather events, like droughts and floods, also caused more soil loss.

Degraded soils, in return, are also bad news for the planet. Healthy and fertile soils work as important carbon sinks. When their fertility is lost, their ability to hold carbon also drops. In the 30 years from 1990 to 2020, the black soil’s carbon stock has dropped by about 650 million tons in northeast China. It would take about 300 million hectares of U.S. forest a year to sequester that much CO₂.



Xi Jinping learns about grain production, the protection and use of black soil during a visit to Jilin province, in July 2020. *Photographer: Wang Ye/Xinhua News Agency/Getty Images*

“Although many Chinese researchers have been working to help the agriculture sector adapt to climate change, the overall national response is still lagging behind,” said Li Zhao, a climate risk researcher at Greenpeace East Asia. “More systematic adaptation strategy and implementation are urgently needed.”

Last summer, 11 people were sentenced to up to seven years in prison for illegally extracting and selling black soil in Heilongjiang province, a series of trials that showcased China’s willingness to use law enforcement to safeguard the land. “We must ensure that the black soil will not decrease and degenerate,” said Chinese President Xi Jinping during a 2020 visit to Jilin province.

Xi promised to “protect and make good use of ‘the giant panda of the cultivated land,’” drawing an analogy to the much loved national animal, which, after dedicated conservation efforts, was removed from global endangered lists last year.

-- *With assistance by John Liu and Karoline Kan*