

BRINGING IN THE SHEAVES

China's farmers battle to ensure maximum crop yields, but inadequate storage facilities and a lack of technical know-how are undermining their efforts, report **He Na** and **Han Junhong** in Jilin.

The stalks of corn stand more than a meter high in Northeast China's Jilin province, but the corn that farmer Han Chang'an harvested last autumn is still stored in his homemade shelter.

Given the constant rise in the price of corn over the past few months, Han's joy was such that he found it difficult to keep a straight face. However, in the past few days his neighbors couldn't help noticing that his smile has faded somewhat.

The weather has turned humid, and rain has fallen for days on end. Some of Han's corn got wet and mold has set in. Even worse for the 50-year-old farmer, rats have penetrated his storage space twice, eating the valuable grain and leaving kernels scattered everywhere.

"I kept the grain for a long time, just waiting for a good price, and now all my efforts have been in vain," said Han, a resident of Dongling village in Shulan city.

Han estimated that he has lost at least 15 percent of his stored grain and the remaining moldy corn is unlikely to fetch a good price at market. "It would have been better if I'd sold it earlier," he admitted with a sigh.

Similarly, Zhao Zhiwen, who lives about 40 km from Han and has stored around 500 kg of rice in her simple barn, also has a headache: Her rice is swarming with bugs because it's been exposed to moisture.

To solve the problem, she has bought vacuum bags and plans to seal the rice off from the air to preserve it and kill the bugs. "Who will want to eat bug-ridden rice?" she asked.

"Farmers are still in the habit of storing grain for personal use. The amount accounts for 45 percent of China's annual grain harvest. However, poor storage conditions and improper methods mean the grain is vulnerable to mold and attack by insects and rats. That means a high level of loss," said He Yi, director of the department of distribution and science and technology at the State Administration of Grain.

To make matters worse, many grassroots grain stores are poorly maintained, resulting in even greater losses.

Thirty percent of China's county-level grain storage depots are in a parlous condition, according to a recent survey conducted by the SAG. It noted that the situation is at its worst in the country's less-developed western regions.

Officials and experts recently warned that the country must take measures to tackle grain losses as soon as possible. They maintain that even if China witnessed good harvests every year, the government's huge financial investment, aimed at increasing output, will have been in vain.

"China's annual post-harvest losses equate to as much as 25 billion kg, that's around 8 percent of national output," said Zhang Tianzuo, director of the farm produce processing bureau at the Ministry of Agriculture, at an agricultural forum held in Beijing in July. The amount equates to the annual output of Heilongjiang province, the country's



Above: A worker uses a spade to encourage corn to dry at a private barn in Yushu city, Jilin province. Below: Grain storage is crucial for both the government and farmers. Han Chang'an built a temporary shelter for corn storage last autumn, but found it difficult to keep the grain dry because of the humid climate.

DING LUYANG / FOR CHINA DAILY

largest grain-growing area.

Scientific storage

To reduce losses, the SAG launched a program in 2007 to promote scientific grain storage containers, which are specially designed to prevent the intrusion of moisture, insects and rats.

Under the program, central and provincial governments pay 60 percent of the cost of each container, while farmers pay the remainder.

"By the end of 2010, 2 million households had improved storage conditions. The program resulted in an obvious reduction in losses, and so we plan to increase that number to 10 million by 2015," said He, adding that 10 million is still just a drop in the ocean.

"To lower the cost of the containers, we hope the program can be listed in the government's agriculture infrastructure, under which farmers will be eligible for subsidies."

Li Guoxiang, a senior researcher in rural development at the Chinese Academy of Social Sciences, pointed out that as more young farmers leave the land and head to large cities as migrant workers, their land is being taken over by a small number of large producers and so improvement of the storage facilities would be a practical move.

Qin Fu, director of the institute of agricultural economics and development at the Chinese Academy of Agricultural Sciences, holds a differ-

ent view. "To reduce losses, we need to gradually change farmers' storage habits and encourage them to sell their crop as quickly as possible. Just as people deposit money in banks, farmers can also deposit their grain with enterprises that have good storage facilities," he said.

In Guantao county, Hebei province, some granary logistics and processing enterprises provide free storage facilities for farmers, who can withdraw the produce when they desire in the form of cash, rice or flour.

Red frames, rotting roofs

Visiting the Yushu Grain Depot in Jilin province feels like stepping back in time: Several rows of red wooden-framed silos dominate the yard. Many were built in the 1950s and some still carry quotations from the late Chairman Mao Zedong painted on the walls.

The dark rooms give off a close, damp smell and some of the wooden roofs are rotting. "These barns are no longer suitable for grain storage. We urgently need new barns, but without money, reconstruction has never really come onto the agenda. It's really a waste of resources, because we have convenient transportation links and a railway runs alongside our facility," said Wei Chunyuan, director of the depot's warehousing department. The other, newer storage facilities are also in need of renovation, he added.

Wei opened the door of a huge silo,



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built in the 1980s, which was brimful of corn. "It is just a huge room, without an underground ventilation system. When the room is too damp, the only way to dry the corn is to open the windows. It's often the case that the corn at the bottom of the pile goes off, and so a high level of loss is inevitable," he said.

"We need to rebuild the barns, because without decent facilities our lives are miserable. We only receive our salaries once every three or four months," said Wei.

According to Liu Xin, general manager of the Yushu branch of Dalian Northern International Grain Logistics Co, the town has 200 grain-related enterprises. A number of the larger ones have built their own well-equipped barns, but a lack of funds means most of the smaller outfits store their produce in simple shelters.

At Yushu Guangfa Grain and Oil Co, the corn is stored in a temporary

brick barn whose inadequate construction allows birds to enter the stores at will, stealing grain and fouling the produce. The store's limited capacity means that some of the corn is simply piled in the yard and covered with blue plastic sheeting, leaving corn cobs scattered everywhere.

According to He Yi, the central government has invested more than 30 billion yuan (\$4.7 billion) since 1998 to establish a number of standardized grain depots nationwide, accommodating 50 billion kg of produce. These depots are equipped with computerized monitoring systems. They provide excellent storage and grain losses can be controlled to within 0.15 percent of the volume.

However, the task of improving storage facilities is far from finished. Many grassroots grain depots are beyond repair.

A town-level depot in Renhuai city, Guizhou province, collapsed in 2009,

as farmers were busily selling their produce. The collapse cost 10 lives.

"That bitter lesson taught us that it's imperative that the grain depots should be completely repaired or even rebuilt. We plan to eliminate these dangerous depots within five years, but that will require strong support from the central government," said He.

The world has entered a dangerous period, according to Qin. The international situation remains tense and turbulent and the acreage of China's farmlands has declined rapidly during the past decade, so a potential grain crisis cannot be ignored.

His prescription is simple: Private enterprise should be encouraged to improve grain storage facilities and ensure the safety of the crop. In addition, the government should offer farmers favorable terms or increase the number of loans available to private enterprises to make use of their barns, rather than pouring vast amounts of money into repairing State-owned grain depots.

"Compared with the huge investment in agriculture before the grain harvest, the amount the government pours into the post-harvest period is small. The government needs to increase its input into grain circulation, because reducing grain losses just another way of increasing output," he said.

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Grains, trains and automobiles

By HE NA

In addition to poor storage facilities, other factors related to grain circulation need to be addressed to prevent high levels of loss, according to He Yi, director of the department of distribution and science and technology at the State Administration of Grain. "In the grain circulation process, losses during transportation, processing and consumption are startling."

Grain is mainly transported in bags, but the poor quality of the bags and their frequent loading and unloading mean they often split, inevitably resulting in losses. Meanwhile, a shortage of purpose-built tankers means that grain transported on the back of trucks and covered with plastic sheeting is likely to be ruined.

In China, grain is usually transported from the northern regions to the south of the country. The lack of a sound logistics system often results in long delays and some of the produce is spoiled in transit.

He Yi suggested opening a special grain transportation channel as soon as possible, and called on the rail authorities to adopt rolling stock specially designed for grain transportation and to extend the network. In addition, he suggested more money should be invested in the construction of modern logistics parks in the main grain-consuming regions to improve the network.

Processing

Most of the losses occur during processing, as a result of a lack of capital and inadequate equipment and technology. China has 18,000 different types of grain-processing enterprises, 90 percent of which are in the private sector, according to the SAG. However, some are just husband and wife operations, which lack the advantages of refined processing techniques.

Excess processing is a common failing, as producers feel that cleaner-looking grain will fetch a better price at market. However,

overprocessing reduces the milled-rate rate — the amount left after the grain has been cleaned — from 72 percent to 58 percent.

"The central government needs to increase investment in the promotion of advanced processing equipment and technology. An appropriate level of processing is vital to reduce losses," said Li.

Waste on the table

"It's common that only two or three people will order five or six dishes. They don't get eaten, and so sometimes more than half the meal is thrown away," said Li Xiaotian, a waitress at a Beijing restaurant. "It makes my heart ache to see such waste," she said.

More important, although society advocates thriftiness and a plain life, the level of wastage after banquets is high.

"Everyone has a duty to save food and to promote the concept of treasuring food. If we can inculcate good habits, the amount saved will surprise a lot of people," said He.



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REPORTER'S LOG | HE NA

Technology ensures safety

The old Chinese proverb says, "For a country, people come first. For the people, food comes first."

High-tech grain depots under the direct management of the State Council play a major role in ensuring grain safety, but few people have ever entered one of these facilities.

On a July morning, I got the chance to visit one of China's top modern grain depots in Jilin province, where an almost military security regime exists.

The depot — covering 160,000 square meters and with a storage capacity of 130,000 metric tons — is located in a city suburb and its two tall drying towers can be seen from afar. The yard is huge and clean, but people are seldom seen walking around it. If the sign didn't hang on the perimeter, the place could easily be mistaken for a military zone.

Following a technician, I climbed a metal ladder to the top of the depot's largest barn and took in the view across the interior. Huge hills of grain glittered like gold in the morning sunlight

Two computer screens in the center of the room displayed variations in temperature, moisture and ventilation. If the readings exceed the specified levels, alarms ring to notify the management team.

All the barns are equipped with 24-hour computer monitoring, high-level ventilation equipment and special insect-control systems.

From the tower, I saw several large fans installed in different places. They're used to ensure that the temperature remains ambient even in the hottest seasons. As a result, the grain rarely spoils and losses are minimal.

The director told me that wheat, rice and oil are also stored at the facilities to be used in the event of emergencies. He declined to provide details of the amounts stored because that information is a State secret.

The State Council decides when to sell grain or replenish the stocks and the director simply executes that order. "My duty is to keep the grain safe and reduce losses to the lowest level," he said.