

SINO-JAPAN TIES IMPROVING P.18 | CHINA'S POSSIBLE 401(K) P.28

# BEIJING REVIEW

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## Scientific Growth

As one of the world's largest grain consumers, food security has always been a major concern for the Chinese nation. China must confront the challenge of feeding a fifth of the world's population with less than 9 percent of the planet's arable land.

In 2011, China's grain output recorded growth for the eighth successive year, and total production reached an all-time high of 571 million tons.

In terms of food security, China's goal is to maintain a self-sufficiency rate of above 95 percent. However, an annual net population growth of 7.39 million and the effective decline of the area of farmland in the country, as a result of urbanization, make achieving such self-sufficiency a serious challenge.

Given the heavy burden placed on Chinese agriculture, constantly raising productivity by relying on scientific and technological progress has become a priority for China's agricultural sector. The Ministry of Agriculture, for example, has worked to raise China's annual grain yield per-unit area by 1 percent, on average, over the past decade.

Last year, the contributory rate of scientific and technological development to China's agriculture reached 52 percent, surpassing the contribution made by land, labor and other production factors for the first time in history.

But to attain the goal of increasing the contributory rate of scientific and technological development to agriculture to above 58 percent by 2015 remains an arduous task.

Currently, there is a glaring gap between the country's relatively low expenditure on agricultural research and development and its enormous need in this regard.

In recent years, the public investment in agricultural science and technology only accounted for 0.25 percent of the total GDP of the agriculture sector, far below the international average of 1 percent.

Insufficient government investment has also resulted in the low uptake of newly developed farming techniques. From 2001 to 2005, just 35 percent of agricultural research and development achievements were applied in production. That figure went up to 41 percent between 2006 and 2010, but was still just half of that in developed countries.

In response to these obstacles, the Chinese Government has pledged to increase its investment in agricultural science and technology year on year. In addition, more policies supporting the development and popularization of new farming techniques are set to be unveiled soon.

A much powerful growth engine of science and technology will make a great difference for China's agriculture. ■

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## From the Editor

*Beijing Review* has undergone a redesign for 2012, creating a fresh look for readers of the magazine that has informed domestic and international audiences about China for over five decades.

We warmly encourage readers to interact with our editors and reporters via the e-mail addresses provided in each edition and offer more crucial feedback to help the quality of articles and the diversity of opinions and viewpoints.



## A Ticket Home

Passengers wait in long queues to buy train tickets at the Changsha Railway Station, Hunan Province, on December 28.

That day was the first day of the train ticket presale for the coming Spring Festival, which falls on January 23. The Spring Festival is the most important traditional Chinese festival and the most important time for family reunions. The weeks before and after the holiday see the largest influx in train passengers. This year, new approaches for ticket sales were employed, such as booking tickets by phone and online, in an effort to ease difficulty over buying tickets.



## HAPPY NEW YEAR

Children of migrant workers display a giant New Year card for their parents in Huanfeng No.3 Primary School in Hanshan County, Anhui Province, on December 26, 2011

## FASHION SHOW

A model performs at a show of ethnic costumes at the First Culture & Art Festival of Lancang-Mekong Basin Countries, which kicked off in Jinghong, Yunnan Province, on December 27, 2011



## Fairy Tale King



**Zheng Yuanjie**, a renowned Chinese writer for children's literature, was honored as one of the 2011 Hot Figures by *New Weekly*

magazine. Zheng was awarded this prize after using his microblog to participate in many ongoing topical issues in society, such as supervising environment protection departments and launching online voting on Beijing's air pollution.

Zheng, 56, began writing in 1977 and set up the *King of Fairy Tales* magazine in 1984, which has been in circulation for 19 years. At its peak, it had a monthly circulation of over 1 million copies. The characters Zheng created—such as the naughty but kind-hearted boy Pipilu, his little sister Luxixi, Shuke the Mouse and Rock the Wolf—have attracted millions of young readers as well as adults over the years.

Besides his writing career, Zheng is also enthusiastically devoted to charity. During the Wenchuan Earthquake in 2008 and Yushu Earthquake in 2010, Zheng donated 380,000 yuan (\$60,192) and 1 million yuan (\$158,400). It was reported that Zheng was planning to set up a literature foundation to honor good literary works, and the standard would be set by the public.

## Accident Aftermath

Fifty-four people were found responsible for a fatal high-speed train crash in July. They included Liu Zhijun, former Minister of Railways, and Zhang Shuguang, former Deputy Chief Engineer of the Ministry of Railways.

On July 23, a high-speed train rammed into a stalled train near Wenzhou in Zhejiang Province, leaving 40 people dead and 172 injured.

According to a final investigation report released on December 28, the train crash was caused by major design flaws in train operating equipment, loose safety controls and poor emergency response to equipment failure.

Liu, Zhang, and Ma Cheng, Board Chairman of China Railway Signal and Communication Corp. that produced the railway signaling system, were chiefly responsible for the crash, according to the State Council.

Liu and Zhang have been removed from office over an alleged "severe violation of discipline."

## GPS Rival

China's homegrown Beidou Satellite Navigation System began providing positioning, navigation and timing services to China and its surrounding areas on December 27.

"Six more satellites will be launched in 2012 to further improve the Beidou system and expand its service area to cover most parts of the Asia-Pacific region," said Ran Chengqi, Director of the Management Office of the China Satellite Navigation System.

China began to build the Beidou system in 2000 with the goal of creating its own global positioning system by 2020. Ten satellites have been launched for it.

The Beidou system is compatible and interoperable with the world's other major global satellite navigation systems, according to Ran.

## Nursing for Seniors

The Chinese Government has issued a five-year plan to boost social services for the elderly.

By 2015, the country expects to provide 30 beds in nursing homes and community care centers for every 1,000 elderly people.

China has a total of 178 million people aged above 60, accounting for 13.26 percent of the total population. That figure is expected to rise to 221 million in 2015 and 243 million in 2020.

In 2010, the number of beds in nursing homes and community care centers for the aged totaled 3.2 million across China, or 18 beds for every 1,000 elderly people.

To meet the 2015 target the country plans to add 3.4 million beds and renovate 30 percent of the current facilities.

Over the next five years, at least 50 percent of the revenue from the state welfare lottery program will be spent on social services for the elderly.

According to the plan, the government will provide preferential land use policies and credit to attract more investment in the sector.

## Exit-Entry Legislation

The Standing Committee of the National People's Congress, China's top legislature, held the first reading of a draft law on exit and entry administration on December 26.

The duration foreigners should be allowed to stay in China and regulations concerning the employment and residence of foreigners were the main focus of the draft.

According to the draft foreigners must receive work permits and residence certificates prior to commencing their employment in China. Foreigners who work illegally in China will be fined between 5,000 yuan (\$792) and 20,000 yuan (\$3,170), and may be detained for 5-15 days for serious violations.

The draft legislation also allows the

Ministry of Public Security and the Ministry of Foreign Affairs to make requirements on the collection of human biological identification information such as fingerprints from people who are entering or leaving the country.

Official statistics show the number of people entering and exiting China has increased by 10 percent annually since 1990. In 2010, the number reached 382 million, including 52 million foreigners.

China has promulgated two separate laws on the administration of the exit and entry of Chinese citizens and foreigners since 1985.

## Disaster Review

As of December 20, 2011, natural disasters left 1,081 people dead or missing in China over past year, said the Ministry of Civil Affairs.

Various natural disasters struck China during the year affecting 440 million people and causing 311 billion yuan (\$49.37 billion) worth of direct economic losses.

Last year, the Chinese Government allocated 8.64 billion yuan (\$1.37 billion) as relief funds to help the country's 75 million disaster affected people.

## Outstanding Artist

**Han Meilin**, a well-known Chinese artist who designed the mascot *Fuwa* for the 2008 Beijing Olympic Games, will hold a solo art exhibition from December 26, 2011, to February 8, 2012, in the National Museum of China. Occupying an area of nearly 6,000 square meters, the exhibition is showcasing over 3,000 pieces of Han's artworks ranging from painting, sculpture, ceramic to design. This is the largest-scale solo exhibition held in the newly-renovated museum.

Han, 75, is famous for his painting, calligraphy, sculpture, ceramics, logo design and writing. He was topped the list of the most global-concerned Chinese characters by *Global Times* in 2011.

He has established the Han Meilin Art Galleries in Beijing and Hangzhou in Zhejiang Province, and donated thousands of his artworks to the country.



**WINTER JOY** Swans frolic on a lake after a snowfall in Rongcheng, east China's Shandong Province, on December 24, 2011





## SHIPPING BOOM

Two container vessels docked at China's Dalian Port. Throughput of the port is expected to surpass 6.4 million standard containers in 2011

## Gas Price Reform

The National Development and Reform Commission (NDRC) on December 26 initiated a pilot program in Guangdong Province and Guangxi Zhuang Autonomous Region to link natural gas prices with import prices of alternative fuels.

The NDRC said it will introduce a "gate price" ceiling for each province, and make regular adjustments to the "gate price" according to import prices of alternative fuels.

The government currently sets natural gas prices largely according to domestic production costs, but the method has been less reasonable as the country becomes more dependent on imports for natural gas.

"The goal of the reform is to eventually build a market-based pricing system and en-

courage efficient use of natural gas," said the NDRC.

## Railway Investment

The Ministry of Railways announced that China plans to invest 400 billion yuan (\$63.19 billion) on railway infrastructure construction in 2012, representing a slight decline from the 469 billion yuan (\$74.1 billion) in 2011.

Railway construction, especially development of high-speed rail lines has been slowing down in the country since a deadly train crash in July 2011.

Sheng Guangzu, Minister of Railways, said on a press briefing that the ministry will raise capital for railroad building through bond issuance, bank loans and other market tools. "Moreover, efforts will also be made to

lure investments from local governments and private investors," he said.

Sheng added that the ministry will spare no effort to ensure quality and safety of railway projects and learn lessons from past accidents.

## Weakening Confidence

The index of entrepreneur confidence declined to 68.4 percent in the fourth quarter, 1.8 percentage points down from the third quarter, according to a survey conducted by the People's Bank of China, the central bank, over 5,000 domestic entrepreneurs.

Analysts believe the decline was because of widespread concerns over the slowdown of the world's second largest economy.

Of the 5,000 entrepreneurs surveyed, 24.8

## Numbers

# \$697.2 billion

China's outstanding foreign debt totaled \$697.2 billion at the end of September, said the State Administration of Foreign Exchange.

# 334.1 billion yuan

China invested a record 334.1 billion yuan (\$52.82 billion) in water conservancy in 2011, said the Ministry of Water Resources.

percent said that the nation's economic status quo is "relatively cool," while 67.1 percent believed that things are still normal, down from 74.3 percent in the first quarter.

## Industrial Profit

In the first 11 months, China's industrial enterprises with annual sales revenue of more than 20 million yuan (\$3.16 million) reported combined profits of 4.66 trillion yuan (\$736.18 billion), up 24.4 percent from a year ago, 0.9 percentage points lower than that during the January-to-October period, according to data from the National Bureau of Statistics.

In November alone, their profits increased 17.9 percent to reach 542.1 billion yuan (\$85.64 billion).

Among the 39 industries surveyed, 36 sectors reported year-on-year profit growth. But the oil refining, coking and nuclear-fuel processing sector experienced a 97.8-percent plunge in profits. The telecommunications equipment, computer and other electronic devices industry suffered a 1.5-percent slide,

while profits of electric and thermal power dropped 8.3 percent.

## Gold Regulation

The People's Bank of China on December 27 announced to prohibit local institutions or individuals from setting up gold exchanges apart from the existing Shanghai Gold Exchange and Shanghai Futures Exchange.

The government bans the establishment of any gold trading platforms in other exchanges. It has ordered to suspend construction of any new gold exchanges or trading platforms. Those which have opened for business must cease operations.

This move is aimed to crack down on surging illegal practices in the country's gold markets and propel healthy development of the emerging industry, said the central bank.

## Energy Acquisition

The Sinopec International Exploration and Production Corp., a subsidiary of China's

top crude refiner, has completed takeover of the Canadian oil and gas explorer Daylight Energy Ltd.

The acquisition will give Sinopec access to Daylight Energy's 69 oil and natural gas assets in Canada's northeastern British Columbia and northwestern Alberta.

According to the deal that was signed in October, Sinopec will pay 2.2 billion Canadian dollars (\$2.11 billion) in exchange for a 100-percent stake in Daylight Energy.

The deal is the second such takeover of a Canadian energy company by a Chinese refiner in 2011, following oil giant CNOOC's acquisition of Canadian oil sands developer OPTI.



**RIDING THE WIND** The first phase of the Jiangsu Rudong Offshore Wind Power Farm, China's largest offshore wind farm, goes into operation on December 28

## Investigated SOE Chief

**Bai Peizhong**, former Board Chairman of Shanxi Coking Coal Group Co. Ltd., is now under investigation for suspected corruption after being dismissed from the post on December 22, 2011. Anti-corruption departments are now investigating the case.

In November, Bai's wife reported to the police that their home was robbed of 3 million yuan (\$475,200) worth of goods. The two burglars were later seized and they confessed to the police they had stolen goods and cash worth 50 million yuan (\$7.92 million), a sum far beyond Bai's official income.

Bai was vice mayor of Xinzhou in Shanxi Province from 2006 to 2008 before becoming board chairman of the Shanxi Coking Group, which is the country's largest coke making company, with total sales of more than 100 billion yuan (\$16 billion) in 2010 and an annual output of more than 100 million tons of coal.



# \$20.39 billion

China's exports of garments and textile products totaled \$20.39 billion in November, increasing 7.2 percent year on year, said the General Administration of Customs.

# 42%

Chinese shipbuilders completed 61.77 million deadweight tons of orders in the first 11 months of 2011, accounting for 42 percent of the global total, said the Ministry of Industry and Information Technology.

XINHUA



## BRITAIN

Police officers gather around a victim on London's Oxford Street on December 26, 2011. A teenager was stabbed to death, while another man was injured in a similar case later that day

## NORTH KOREA

XINHUA



North Korea's new leader Kim Jong Un escorts the hearse of his late father Kim Jong Il during a state funeral on December 28, 2011, in Pyongyang

## COLOMBIA



Newly built escalators in the Comuna 13 neighborhood in Medellín are opened on December 26, 2011. The escalators, replacing more than 350 concrete stairways for the benefit of 12,000 users, are the first of their kind to be installed in a Colombian shantytown with high rates of urban violence



## JAPAN

A female sea lion helps a trainer clean her room at the Shinagawa Aqua Stadium in Tokyo on December 28, 2011, during aquarium's year-end general cleaning



Swimmers get into the water during their traditional Christmas swim in the Vltava River in Prague on December 26, 2011

## THE CZECH REPUBLIC

## ITALY

A book damaged by termites is displayed on a shelf of the museum at the Central Institute for the Conservation and Restoration of Damaged Books in Rome on December 20, 2011. Since its founding in 1938, the institute has worked on everything from the *Dead Sea Scrolls* to one of the oldest *Qurans* in the world



## COVER STORY

# DRIVING FARMING WITH TECHNOLOGY

China needs a stronger agriculture science and technology sector to ensure its grain security By Tang Yuankai

**A**t the beginning of 2011, major grain producing provinces in central and east China experienced a prolonged drought that stretched for more than three months.

Then in summer, a severe drought left millions short of drinking water in southwest China. Even the usually water-rich regions along the middle and lower reaches of the Yangtze River were not spared. In May, they suffered from the worst drought in 50 years, heavy rains eventually relieved the drought but these rains in turn caused serious flooding.

Despite the disasters, last year saw a bumper harvest in China.

On December 16, the Ministry of Agriculture said that the total grain output in 2011 reached a historical high of 571.2 billion kg, up 24.75 billion kg, or 4.5 percent, from 2010.

China's grain yield had been on the rise for eight consecutive years. Between 2004 and 2011, grain production increased by 140.5 billion kg, with an annual increase of 17.5 billion kg, the largest since 1949.

"In 2011, the yield of the three staple grains—rice, wheat and corn—all increased, with a total increase of 22.25 billion kg, a rise across all three crops has been rare in the last two decades," said Chen Yinshan, chief economist and spokesperson of the Ministry of Agriculture.

Minister of Agriculture Han Changfu attributed the increase to favorable policies, infrastructure construction and scientific and technological support services.

### Grain security

"Grain production is a strategic industry, and keeping the country's billion plus population fed is the most important thing for China," Han said.

Statistics from the Agriculture and Rural Affairs Committee of the National People's Congress show that over the past few decades in China, an average of 7.39 million people have been added to the population each year, whereas the area of arable land has been dropping.

Currently, there are 121.9 million hectares of arable land in China, 8.2 million hectares less than that in 1997. On average, China has 0.092 hectare of arable land per capita, which is 40 percent less than the global average.

With a large population and low per-capita arable land acreage, China faces bigger and bigger grain security challenges.

China imports 80 percent of its soybean requirement, 60 percent of its edible oil, 30 percent of its cotton and 20 percent of the sugar consumed in the country. As more corn is needed for animal feed and other corn products, the domestic supply has fallen short and imported corn is now being

used to fill the gap.

Also, China has to import more than 70 percent of the advanced processing equipment it uses in agricultural production, whereas domestically produced agricultural machinery is only up to the standards of machinery produced in developed countries in the 1970s.

"To ensure grain security, Chinese people's rice bowl should only be filled by themselves," Han said.

According to Han, the total volume of grain traded worldwide is usually about 250 million tons, less than half of China's total grain output, and the annual global trade volume of rice is about 25-30 million tons, about 15 percent of rice consumption in China.

"Therefore China cannot depend on the international markets to fill domestic production gaps and the country must adhere to the policy of self-sufficiency and strive to supply more than 95 percent of its own consumption of rice, wheat and corn," Han said. He added that China's grain self-sufficiency will con-



IFZGNOHZ OYHZ



SUPER RICE: Yuan Longping (with loud speaker), introduces the Y Two Superior No.2 strain of rice to foreign visitors to his experimental field in Longhui County, Hunan Province, on September 29, 2011

tribute to global grain security.

Though Han believes that China's grain output can be increased to meet increasing demand in the country, expanding the area under cultivation is obviously not an option as the country already has little spare land. But he expected progress in science and technology would be able to increase the average grain yield per-unit area in China by more than 1 percent each year by 2020.

"China's grain yields per-unit area is still far behind those of developed countries. In China, the yield per-unit area of the same crop differs widely in different areas, sometimes, by more than 750 kg per hectare in some cases," Han said.

In addition to increasing yields per-unit area, medium- and low-yielding farmland can also be improved to increase output.

"Currently, medium- and low-yielding fields account for 70 percent of the total, and their yields per-unit area can be improved by water conservancy construction," Han said.

At the annual central economic work conference that concluded on December 14, top economic policymakers discussed issues relating to agriculture, rural areas and farmers. Participants stressed the need to speed up progress in agricultural science and technology, boost relevant research and education programs and accelerate the application of new farming techniques.

Several industry insiders interviewed by *Beijing Review* at the end of last year expected agricultural science and technology would be the focus of the No.1 Document of 2012.

The No.1 Document is the first document released by the CPC Central Committee every year, which usually lists key and pressing problems to be solved by the ruling Party and the government during the year and serves as a guideline for the whole year's work.

Recently the document has become a synonym for the importance that the CPC Central Committee attaches to rural issues, because from 1982 to 1984 and from 2004 to 2010 the

No.1 document focused on issues related to agriculture, the countryside and farmers.

## Removing barriers

In 2010, science and technology contributed 52 percent of China's agricultural growth, exceeding the contribution rate from land, the labor force and other production factors.

"In the next five years, China plans to increase the contribution rate of science and technology to more than 58 percent," said Pan Haiping, Deputy Director of the Science and Technology Education Department of the Ministry of Agriculture.

To achieve this goal, Pan said that the government will deepen reform of agricultural research institutes, improve agricultural science and technology management systems, spur innovation, promote the application of new farming techniques at the grassroots level, cultivate more able researchers, and give continuous and stable

support to long-term research.

According to him, the development of China's agricultural science and technology has been hampered by insufficient investment and the lack of qualified people working in agricultural research.

Though government funding in agricultural science and technology has increased in recent years, fiscal investment in agricultural science and technology only accounted for about 0.25 percent of China's agricultural GDP, lower than the international average of 1 percent.

"A small foreign company may spend more than 20 million yuan (\$3.1 million) a year on rape seed research, more than China's total annual spending in this field," said Fu Tingdong, a professor at Huazhong Agricultural University. He also blames the structure and allocation of research funding in China for being inflexible.

Zhang Zhenghe, a professor at the School of Economics and Management of China Agricultural University, said that in recent years, the government had increased financial supports to promote agricultural research and development, yet financial institutions failed to play their expected role.

"Many financial institutions are reluctant to support research and development programs because such investment is considered risky and has a long payback period. They would rather lend to companies with mature markets and products," Zhang said.

"The government is going to steadily increase the amount it invests in agricultural science and technology," said Zhang Taolin, Vice Minister of Agriculture, in November 2011.

In the same month, eight central government departments issued a circular on boosting financial investment in science and technology.

The document encourages financial institutions to support key agricultural research and development programs with more loans and help hi-tech companies raise funds in the capital market.

China has more than 100 public-listed agricultural companies, 60-70 percent of which have research and development programs projects.

"Universities and research institutes usually focus on basic scientific researches, whereas companies can engage in applied science innovation," said Song Jiening, an agricultural consultant in CIConsulting,

a leading industry research institution in China.

## Seeds key to growth

"When I am 90 years old, the yield per hectare of hybrid rice should reach 15 tons, so that the land can feed 400 million more people," said 81-year-old Yuan Longping, an academician of the Chinese Academy of Engineering.

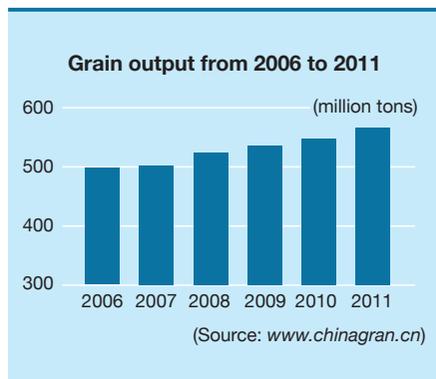
Yuan, who has dedicated his life to breeding more productive strains of rice, is known as "the father of hybrid rice." He believes that good seeds are the key to high rice output. So far 330,000 hectares of paddy fields in China have been planted with the Y Two Superior No.1 strain of rice developed by Yuan in 2001.

In September 2011, the Y Two Superior No.2 strain of rice Yuan was testing registered a record yield of 13.90 tons per hectare, whereas the yield per hectare of regular strains of rice was usually between 4.5 and 6 tons. The achievement firmly put China at the forefront of international research into hybrid rice.

Rice of this high-yielding strain is characterized by a large ear with many grains and strong resistance to diseases. In 2008, its patent was auctioned to a Chinese company at the price of 6.5 million yuan (\$1 million).

Although China is good at producing hybrid rice, the country does not produce the best varieties and seeds of other crops. Data from the Ministry of Agriculture show that in China, more than 90 percent of the high-end vegetable and flower seeds used domestically are imported. In addition, 50 percent of the prime stud animals used in the rearing of pigs, chickens and cows are also imported.

In recent years, foreign breeding and seed



companies have entered the Chinese market, seizing market share and crowding out some domestic companies in the industry.

"Recently, the Ministry of Agriculture and the Ministry of Technology issued a circular to encourage agricultural science and technology innovation, especially the development of the breeding and seed industry," said Zheng Fengtian, Vice Dean of the School of Agricultural Economics and Rural Development of the Renmin University of China in Beijing.

On April 18, 2011, the State Council issued a document to hasten the development of a modern crop seed industry in China. It clearly defined the strategic position of the seed industry and spelled out specific measures to support seed companies. For instance, it said that internationally competitive companies in the industry should be nurtured through mergers and acquisitions.

On May 9, key leading enterprises in China's seed industry held a meeting in Changsha, Hunan Province. Industry insiders



CHEN HAINING



LI XIAOQUN



DENG LANGKUI



ZHANG XU

1. FIGHTING DISASTER: A farmer couple in Zhaotong, Yunnan Province, sow seed potatoes in a drought-affected corn field on August 24, 2011, in hopes of making up their loss

2. SEED "SILICON VALLEY": Cheng Xiangwen, one of China's leading scientists in corn research, examines new corn species in a breeding base in Hainan Province on January 20, 2011

3. GETTING RICH: Farmer Huang Mingcong harvests black fungus in his field in Xuanhan County, Sichuan Province, on May 21, 2011

4. SEED OF HOPE: A bidder wins four ears of a new corn variety at an auction of crop seeds in Beijing on September 21, 2011

said that the meeting was the most important for the industry in more than 50 years. Premier Wen Jiabao said in a written speech that China is a major agricultural nation, and speeding up the development of the seed industry is a strategic choice to build modern agriculture and ensure national grain security and an important way to boost agriculture through science and technology and shift the agricultural growth model.

In August, the Ministry of Agriculture issued a regulation on crop seed production license management, which increased the threshold for entry into the seed market and encourages seed companies to merge, regroup and cooperate with seed research organizations. The ministry also cracked down on intellectual property rights infringements and cases involving the production or sale of fake or inferior seeds.

The ministry also set up a new department to supervise the quality and security of seeds, including transgenic seeds, in the latter half of 2011.

The government plays a leading role

in promoting agricultural science and technology application. It provides discounted loans, grants and capital injections for this purpose. In 2001, the State Council set up the Agricultural Science Technology Achievement Transformation Fund. In the following 10 years, state allocations to the fund totaled 3.15 billion yuan (\$485 million).

### Popularization difficulties

Despite this, the promotion of new farming techniques is still a headache for the government and agricultural scientists.

"Even though some important progresses in agricultural science and technology have been made, and China's ability to innovate in agriculture has improved in many cases, these achievements have not been put into practice," said Pan of the Ministry of Agriculture.

Official statistics show that every year, nearly 6,000 new techniques in agricultural sectors are approved by provincial- and ministerial-level governments, yet during the period from 2006 to 2010, only about 40 percent of these

achievements were put into commercial use.

Some experts blame the situation on the inadequate performance evaluation system in agricultural research institutes, where scientists tend to be judged by the number of projects they have worked on and the papers they have published. As a result, they argue, not enough attention has been paid to the successful commercialization of research results.

In addition, as a large number of rural residents have moved to cities, there are not enough qualified people in the rural areas to apply new science and technology.

Pan said that institutional reform is needed to promote the application of agricultural science and technology.

But, according to Song of CICConsulting, promotion of new farming techniques in remote areas is still a responsibility of the government because for-profit enterprises are unlikely to be interested in it. ■

## COVER STORY

# GO TO THE FIELDS

China finds ways and difficulties in spreading new farming techniques in rural areas By Tang Yuankai

**A**t the end of 2011, Jiang Peize, a member of the Technical Task Force (TTF) in Xuanen County, central China's Hubei Province, visited Yuheping Village in the county and showed local farmers how to use straw to protect their tea seedlings from winter frosts.

There are more than 300 TTF members in Xuanen. They help farmers deal with practical problems in production and spread new farming techniques in order to raise agricultural output and efficiency.

The TTF system was created in Nanping City, Fujian Province, in 1999. Now, many more provinces have adopted the system, which proves successful in putting scientific and technological advances to good use in vast rural areas.

"I am just a conduit, someone who transfers new science and technology and new information to farmers," said Xing Wenzhi, a TTF member in Songyuan City, northeast China's Jilin Province.

Xing set up an experimental peanut cultivation demonstration base to offer local farmers technologies, seeds and supplies they need to plant peanuts. His efforts have helped increase local peanut production by up to 20 percent.

With a population of 2.8 million, Songyuan is the first city in Jilin Province to adopt the TTF system. From 2003, selected TTF members were sent to rural areas around the city to promote scientific and technological projects. To date, TTFs have completed more than 200 projects in the city and helped tens of thousands of rural households.

Hunan Province in central China introduced the TTF system in October 2005. So far, it has invested 6.7 billion yuan (\$1.06 billion) in projects to advance agricultural science and technology and has promoted 6,384 new farming techniques and products. The Science and Technology

Department of Hunan Province plans to establish 50 TTF-backed business chains in the province by 2015.

Now that the TTF has become more established, the Chinese Government is looking to expand its scope and effectiveness.

"The adoption of the TTF system is an important strategic move by the Central Government to dispel the urban-rural dichotomy and promote the industrialization, urbanization and modernization of rural areas," said Zhang Laiwu, Vice Minister of

Science and Technology at a national conference in 2011.

## Examples

Professor Li Xiaolin at China Agricultural University is happy to see ever larger harvests of grain and the smiling faces of the farmers he has helped.

Since 2009, Li has spent more than 280 days every year offering technical services to farmers in Quzhou County, north China's Hebei Province. According to Li, sometimes even local farmers asked him, "Why do you stay here so long?"

"We go to the countryside to help farmers. How can we go away without making some contribution," Li said.

Though having been engaged in basic research for more than 20 years, Li said that in quite a long period in the past, his field of research was theoretical and his research achievements didn't bring much practical benefits to farmers.

"I feel my work is useful after beginning to work directly with farmers," he said.

According to Li, in recent years a number of breakthroughs were made in agricultural science and technology but only a few of these breakthroughs actually led to changes in the fields. "It is a great pity," he said.

Li's co-worker Rui Yukui went to a rural area in Yushu City, Jilin Province, and stayed there for almost two years. He succeeded in helping local farmers increase their corn production by 20 percent.

"Previously, we had no idea if our work was really useful or not," Rui said. "It feels good to know that our efforts are worthwhile."

"Farmers definitely need new techniques," said Zhang Zhenghe, another professor at China Agricultural University. "More than 80 percent of farmers we surveyed recently agreed that the adoption of new techniques



CROP-DUSTER: A TTF member in Shucheng County, Anhui Province, fills the tank of an unmanned helicopter with pesticide to spray on farmland on August 20, 2011



WANG PENG

GREEN CLASS: Na Weihua, a TTF member in Yongning County, Ningxia Hui Autonomous Region, demonstrates seedling cultivation technology to farmers on November 29, 2011

would help them make more money.”

Even so, it takes time for farmers to adopt new farming techniques on their own lands. “Normally, new techniques cost money and many farmers don’t want to pay for that and would rather stick to old methods of production,” Zhang said. “If we can develop some techniques that can be learnt as easily as possible, say a point-and-shoot camera, it will definitely help their popularization.”

Professor Li echoed Zhang’s remarks, saying while some new techniques may seem very promising, they are not practical for ordinary farmers. “Only after we came to the fields did we find out what farmers really needed,” he said.

Despite the clear benefits of direct involvement in agricultural production, many researchers still spend more time writing papers and developing patents than researching what farmers really need in practice. “They don’t go to the fields at all. Instead, they just stay in the labs and normally their technologies are not that appropriate for the farmland,” Li said.

To change this situation, Li suggests that the evaluation system of agricultural researchers should be reformed. “The ef-

fectiveness of a new technique should be included as a very important factor for the evaluation,” he said.

## Difficulties

China has the world’s largest number of programs and teams dedicated to agricultural education, research and popularization. Although the development of agricultural science and technology has made a great contribution in feeding China’s 1.3 billion people, the overall level of agricultural science and technology in the country is still low. Besides, there are still many difficulties in transferring new technologies from labs into practice.

In fact, China first set up a system to promote agricultural science and technology in the 1950s under the planned economy. However, that system failed to develop smoothly.

In March 2011, at the Fourth Session of the 11th National People’s Congress, China’s top legislature, 158 lawmakers submitted five separate motions on the modification of the Law on the Popularization of Farming Techniques, which said the current law was no longer effective in promoting agricultural science and technology.

Based on his long time experience con-

ducting research in rural areas, Luo Xiaoyong, Vice Dean of the Agronomy and Plant Protection School of Qingdao Agricultural University in Shandong Province, believes the mismanagement of current agricultural science and technology popularization schemes is an increasingly serious problem.

“I spend less than 10 percent of my time on popularization of agricultural science and technology, because I have to handle a lot of administrative affairs,” said Yuan Yong, Director of the Agricultural Service Center of Dongxi Township in Jianyang City, southwest China’s Sichuan Province. There are altogether three people at the service center. But Yuan admitted even if they spent all their time on promoting new technologies, it wouldn’t help too much.

“Most of the young people and men in the villages have already migrated to big cities to work, only women and seniors stay in the villages. Most of them are not well-educated and don’t want to accept the new techniques,” Yuan said.

Similar with the Agricultural Service Center in Dongxi Township, more than 50 percent of grassroots institutions engaged in promoting agricultural science and technology are managed by township governments.

According to the report in the *People’s Daily*, most of the institutions only receive 500 to 800 yuan (\$79-127) in government subsidies every year. As a result, these cash-strapped institutions have gradually become marginalized.

In October 2011, the National Development and Reform Commission issued a statement, requiring local governments to clarify subsidy standards for townships agricultural science and technology popularization stations. At the same time, the Ministry of Agriculture and the Ministry of Science and Technology also issued notices, demanding local governments make plans to improve the conditions of these institutions.

In 2011, the Ministry of Agriculture held more than 100,000 training classes and trained 12.1 million farmers. The ministry said that in 2012, it will change the development modes of agricultural science and technology, increase technical service programs in rural areas and raise improve the management of organizations for agricultural science and technology.

“Efforts should be made to attract graduates from agricultural universities to work at grassroots level and transfer their knowledge into productivity,” Yuan said. ■

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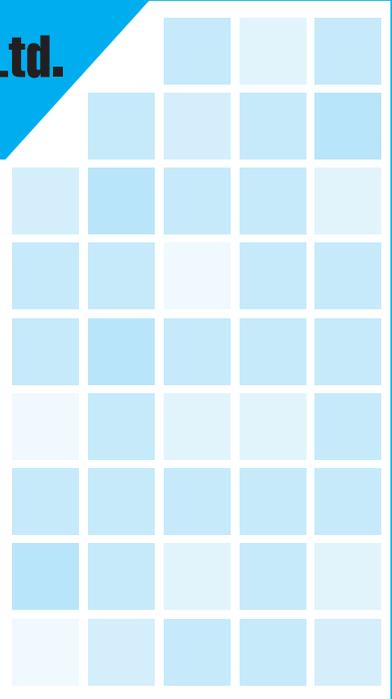
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