

PLANT SCIENCE

China Plans \$3.5 Billion GM Crops Initiative

BEIJING—Confronted with land degradation, chronic water shortages, and a growing population that already numbers 1.3 billion, China is looking to a transgenic green revolution to secure its food supply. Later this month, the government is expected to roll out a \$3.5 billion research and development (R&D) initiative on genetically modified (GM) plants. “The new initiative will spur commercialization of GM varieties,” says Xue Dayuan, chief scientist on biodiversity at the Nanjing Institute of Environmental Science of the Ministry of Environmental Protection.

A central aim is to help China catch up with the West in the race to identify and patent plant genes “of great value,” says Huang Dafang, former director of the Biotechnology Research Institute of the Chinese Academy of Agricultural Sciences in Beijing. Once intellectual property rights are in place, says Huang, transgenic technology could transform Chinese farming “from high-input and extensive cultivation to high-tech and intensive cultivation.”

In the decade since China first allowed commercial planting of four GM crops, the government has moved cautiously, granting only two further approvals for small-market species: poplar trees and papaya (see table). Currently, just one GM crop—insect-resistant cotton—is now planted widely, says Xue. China has balked at commercializing GM versions of staples such as rice, corn, and soybeans.

That may change, as China’s leadership has thrown its weight fully behind GM. “To solve the food problem, we have to rely on big science and technology measures, rely on biotechnology, rely on GM,” Premier Wen Jiabao told academicians last June at the annual gathering of the Chinese Academy of Sciences (CAS) and the Chinese Academy of Engineering. China’s State Council, which Wen leads, approved the GM initiative in July.

Details of the new initiative, including which crops will gain initial support, are being hammered out, scientists say. Some funds will go to R&D on transgenic livestock, an area that has lagged behind GM crops. By 2006, the Chinese government had granted permits for 211 field trials of 20 GM crops, including the six approved for commercial production. As in

other countries, the varieties that China has commercialized so far are equipped with genes to resist pests, tolerate herbicides, or stay fresh longer—not genes that directly boost yields.

Proponents note that China’s cautious

“I hope the commercialization of GM rice will come within a couple of years,” he says.

Although the central government has not released a budget figure for the new initiative, a spokesperson for the Ministry of Agriculture

told *Science* that it would cost \$3.5 billion over 13 years. Half is expected to come from local governments on whose land GM crops will be grown and from agricultural biotechnology companies. “It’s a new way to support a big science project in China,” says Huang Dafang. Another departure from other R&D initiatives, he says, is that each funded program is expected to produce an economic payoff.

One component of the initiative will be to educate the public about GM crops, says Huang Jikun. Although China is unlikely to see the sort of protests that have derailed field trials and commercialization in Europe, there are currents of disquiet in the general population. “For consumers, the safety of GM crops is the biggest worry. Just like some people are afraid of ghosts, some people are afraid of GM crops,” says Zeng Yawen of the Biotechnology and Genetic

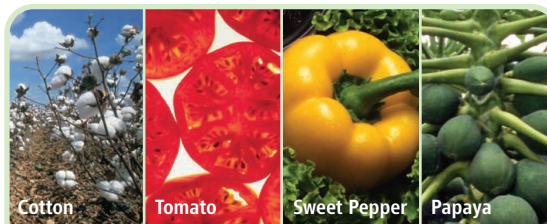
Resources Institute of the Yunnan Academy of Agricultural Sciences in Kunming. Although Zeng believes that GM food safety will be demonstrated adequately, he worries that the new initiative will push China to “move too fast to commercialize GM varieties.”

But with questions mounting about China’s ability to feed itself, others contend that not pushing ahead with GM varieties could be more detrimental than any theoretical hazard. “Any kind of new technology may have risk,” says Huang Dafang. But legitimate concerns, he says, should not be overshadowed by scare tactics designed to “mislead the public in the name of environmental protection.” With the country’s leaders firmly behind GM crops, it’s unlikely that any protests would get very far.

—RICHARD STONE

With reporting by Chen Xi and Jia Hepeng.

CHINA’S TRANSGENIC PLANTS



PLANT	YEAR COMMERCIALIZED
Cotton	1997
Petunia	1997
Tomato	1998
Sweet pepper	1998
Poplar trees	2005
Papaya	2006

Slim pickings. Of the six plants that China has approved for commercialization, only cotton is grown widely. A new initiative could pave the way for GM versions of the biggest prize of all: rice.

embrace of transgenic technology has yielded a major success story: GM cotton. Introduced into commerce in 1997, 64 varieties of pest-resistant cotton are now grown on 3.7 million hectares, or about 70% of the area devoted to commercial cotton, averting the use of 650,000 tons of pesticides, says Huang.

The big prize is GM rice. Three years ago, Huang Jikun, director of CAS’s Center for Chinese Agricultural Policy in Beijing, and colleagues reported that field trials of GM rice in China were going well—boosting yields and reducing pesticide use on plots—and predicted that the varieties were on the threshold of commercialization (*Science*, 29 April 2005, p. 688). But the Chinese government is reluctant to tinker with the country’s most important crop and has put off commercialization. The new initiative might break the logjam, says Huang Jikun.