training graduates are shown in Fig. 2, and the differences are clear.

The A trainees tended to long for the grandeur of nature and wanted to escape the city, while the B trainees tended to be interested in both dairy farming and nature. In contrast to this, many of the C trainees had a great interest in the rural lifestyle and food self-sufficiency.

3. Related publications

Aikawa, Y. "Ladies' Farm School Training Facility, in Shintoku Town and Hokkaido Supports Women with Agricultural Ambitions" *Agriculture and Forestry Economics*, Jul. 11, 2002.

Aikawa, Y. and Ide, H. "Graph Comparison of Rate of Non-marriage in Urban and Rural Areas", *Agriculture and Forestry Statistical Survey*, Volume 53, Issue 1.

Research Members

Yoshihiko Aikawa, Noboru Hashizume, Tomoko Ichida, Masami Mizuno and Hitomi Nakamichi

Recent Trends of Production and Regulations of Genetically Modified Crops in China

Masashi TACHIKAWA

China is famous for its first attempt at transgenic tobacco production on a commercial scale in the late 80s. Recently its production acreage of GM crops is rapidly increasing. In particular, most of the acreage comes from transgenic cotton, which reaches over 2 million hectares. Now China has become the fourth largest grower of GM crops in the world after the US, Canada, and Argentina.

(1) New Regulatory Framework

In 2001, China's State Council introduced a new policy framework for GMO issues, called "Regulation on the Safety Administration of Agricultural Biotechnology." Further, in 2002, the Ministry of Agriculture issued a new set of implementation regulations concerning GMO safety management, import safety management, and labeling. Those regulations are as follows; "Measures for the Safety Evaluation Administration of Agricultural GMOs," "Measures for the Safety Administration of Agricultural GMO Imports," and "Measures for Agricultural GMO Labeling Administration."

As for the import safety regulation, the clause: "the Ministry of Agriculture shall make a decision of approval or disapproval within 270 days after receiving the application" (Article 17) caused trade disputes with the US government. After negotiations between the governments it was agreed to suspend the regulation, and introduce an interim measure for import safety regulation until September 2003. The labeling regulation was put into effect on March 20, 2003. As for the mandatory labeling system, even oil and feed are required to be labeled as such (same as EU system), and a threshold level is not set for unintended contamination (Table 1).

Table 1. Items under Mandatory GMO Labeling

Soybean	seed, soybean, flour, oil, soy meal
Corn	seed, corn, flour, oil, corn meal
Rapeseed	seed, rapeseed, oil, rapeseed meal
Cotton	seed
Tomato	seed, fresh tomato, tomato sauce

Source: "Measures for Ag GMO Labeling Administration".

(2) Regulatory System

The Chinese Ministry of Agriculture (MOA) is in charge of safety regulation of agricultural GMOs from many aspects; food, environment, and feed. However, at the national level, six ministries consist of the Ag GMO Joint-Ministry Conference System, which discusses and coordinates major problems regarding agricultural GMOs. Every application for safety certificates from the MOA needs to be submitted on a variety by variety basis, and by the provincial government where developers of GMOs are considering actual plantings. This kind of procedure increased the number of applications for GMO safety evaluations. As of the end of 2002, it is reported that forty certificates have been issued from the MOA, and about 30 of them are for GM cotton. Another important point is that all safety certificates for Ag GMOs have a limited time period, typically five years.

(3) Production Situation

Today there are four GM crops which are planted on a commercial basis: cotton, tomato, petunia, and pepper as shown in Table 2. However, cotton is the only crop which is widely grown. Its acreage reaches about 2 million hectares. The GM cotton is mainly grown in the

Table 2. Commercialization of GMOs in China

1997	Bt cotton color-changed petunia
1999	virus-resistant sweet pepper long-shelf-life tomato virus-resistant tomato phytase for food-additive vaccine for animal use
2001	virus-resistant chilli pepper

Source: Intrerviews at CAAS.

north of China, around Hebei, Shandong, Henan, and Anhui provinces. In the south, the percentage of GM cotton is smaller than in the north. Also, GM cotton is not grown in Xinjiang province where cotton acreage is the largest throughout China (Fig. 1). This is mainly because Xinjiang province is not affected by the pests against which Bt cotton has advantages.

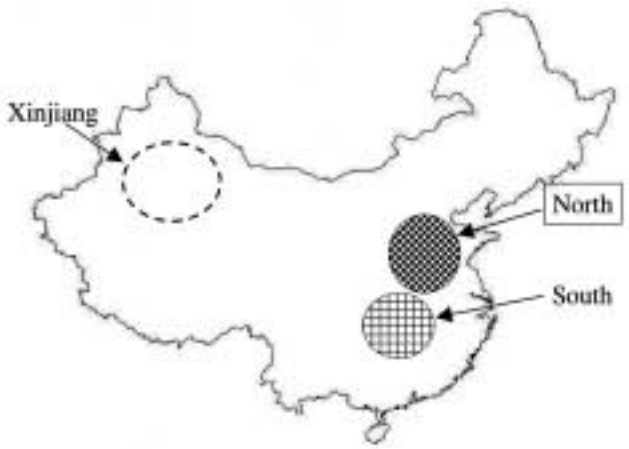

Fig. 1. Major Production Area of GM Cotton

(4) Seed Production and Distribution

As for the GM cotton, there are two types of Bt cotton; one is developed by Monsanto, a multinational firm in the field of biotechnology, and the other is developed by the Chinese Academy of Agricultural Sciences (CAAS). We found there is an intellectual property issue regarding the distribution and propagation of GM cotton seed in China. This is because the legal protection system for new varieties is still in the development stage in China. While the Monsanto variety is legally permitted in only four provinces, Hebei, Shandong, Henan, and Anhui, the CAAS variety is permitted in almost all cotton-growing provinces.

(5) R&D Trends in Biotechnology

Recently China is pouring every kind of resource into R&D in biotechnology. During the last ten years (1990-2000), the number of researchers doubled and research funds increased fourfold (Fig. 2). This rapid growth of research staff and funding shows China's high expectations toward biotechnological development including agriculture. For China agricultural biotechnology seems to give promising answers to their food demand. However, from the viewpoint of food imports, China seems to feel a great threat from increasing imports from various countries. We need to be sensitive to their position in world trade and their regulatory changes in order to understand the context of introducing stricter GMO regulations under the WTO rule.

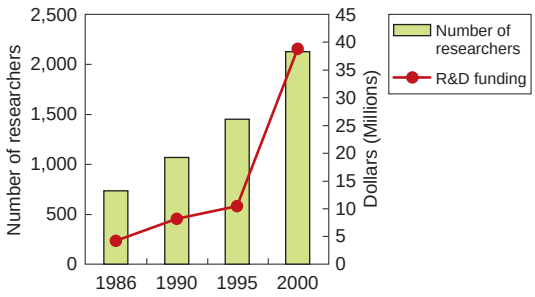

Fig. 2. R&D Trends of Biotechnology in China

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Understanding Production Development Trends Through Comparative Analysis of Agriculture Reform in the Former Soviet Union

Koichi NOBE

Introduction to Research Results

At the end of the 1990s, agricultural production in the CIS countries finally stopped their decline, and signs of recovery were observable (Table 1). The occasion for this was a favorable turn in the overall economic conditions, and what brought this about was the August 1998 economic crisis in Russia. Although having a time lag, the economic crisis devalued the currencies of other CIS countries besides Russia. As a result, the competitiveness of domestic agricultural producers tem-