Human research capacity in Chinese agbiotech

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China's recent R&D investment has resulted in a growth in research capacity and personnel, particularly in the agbiotech sector.

In 2008, China initiated the National GM Variety Development Special Program (GMSP), which supplemented existing funding mechanisms for genetically modified (GM) agricultural research with $3.8 billion in 2008–2020. The aim of the GMSP was to spur growth in the agricultural research sector.

We present here the abridged results of a survey of all Chinese public universities and research institutes involved in GMSP, with the aim of estimating the current capacity in terms of manpower in the agricultural biotech sector and to assess the effects of GMSP on agricultural research.

Table 1 Number of agricultural researchers in the surveyed universities and institutes engaged in the GMSP, for the years 2005 and 2008–2010

Type of research	2005	2008	2009	2010
Agricultural research[a]	95,608	93,567	94,976	95,300
Agbiotech research	9,915	11,719	12,539	13,072

[a]Data obtained from the Chinese Ministry of Agriculture. Data for 2006–2007 not available.

Table 2 Percentage of agbiotech researchers educated to different degrees in the surveyed universities and institutes engaged in the GMSP, 2005 and 2008–2010

Level of qualification	2005	2008	2009	2010
PhD degree	34.2	42.2	44.6	45.9
Master's degree	27.6	28.3	28.2	28.0
Other	38.2	29.6	27.2	26.1

Survey methodology

To collect data for our survey, we contacted 186 colleges and public research institutes by mail and followed up by telephone. We estimate that these 186 institutions comprise >80% of agbiotech research teams in China.

At each college or institute, we worked closely with the research management division. The division head was responsible for completing all data in the survey and for returning them to us. All participants were informed that all information collected would be used only for the research and that in the final data sets their affiliations and names would be eliminated, and that their survey information could only be identified with the aid of a confidential identifier code. Our survey response rate was 100%. To ensure the quality of data, we made phone calls to the heads of research divisions and research team leaders to fill in the missing information or clarify inconsistencies in the data received.

Survey results

The survey shows that >13,000 researchers work on agbiotech in China—including on GM plants, animals and microorganisms—in our samples in 2010 (**Table 1**). Interestingly, although the total number of agricultural researchers fell slightly in recent years, that of agbiotech researchers increased from 9,915 in 2005 to 13,072 in 2010. The percentage of biotech researchers out of total agricultural researchers increased from 10.4% (9,915 out of 95,608) in 2005 to 13.7% (13,072 out of 95,300) in 2010 (**Table 1**).

Our survey confirms that China has substantially improved the quality of its research base. This is demonstrated by the rising share of researchers with PhD degrees, from 34.2% in 2005 to 45.9% in 2010 (**Table 2**).

Conclusions

To raise agricultural productivity and ensure national food security through novel GM technology, China has invested heavily in R&D in recent years. Our survey suggests this has resulted in a growth in research capacity and personnel, particularly in the agbiotech sector. In addition, the credentials of workers in the agricultural research sector have also improved.

COMPETING FINANCIAL INTERESTS
The authors declare no competing financial interests.

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