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CHAMPIONING THE NEW TECHNOLOGIES

The role of the USA in research and trade

KEY THEMES

- Extensive public support for genetic modification.
- The role of the private sector.
- Cooperation for trade.
- International influence.

Genetic modification technology is just one tool that the USA is targeting to tackle global hunger and poverty.



Longstanding international engagement

The US government, largely through the US Department of Agriculture (USDA), has a 150-year history of supporting research in the food and agriculture sector, most recently in genetic modification (GM). It also makes strenuous, wide-ranging efforts to promote trade in GM products through bilateral, multilateral and regional networks. Central to both is the active promotion of transparent, predictable and science-based regulatory systems that foster innovation and help the adoption of – and trade in – GM crops.

The latest GM technology is just one tool among many that the USA is targeting in order to tackle global hunger and poverty, but it regards the new genetics as particularly important if farmers are to produce more on less land and with fewer inputs. These technologies also matter hugely in the economy of the USA itself, being essential to its own agriculture and a powerful generator of exports.

Supporting international research

The USDA supports modern plant improvement and biotechnology research through several major initiatives.

- The Animal and Plant Health Inspection Service is concerned with plant and animal health as well as providing information related to food safety, including GM crops. It is also the agency ensuring the safety of GM crop varieties and products imported into the USA. With offices around the world, the Animal and Plant Health Inspection Service links up with the US Foreign Agriculture Service to provide training for scientists abroad and in the USA, with special emphasis on food safety and the import of agricultural goods including biotech products.
- The Foreign Agriculture Service administers and awards fellowships for training scientists and students under a variety of programmes, including biotechnology, biosafety and regulatory issues.
- The Agricultural Research Service conducts and hosts research in several facilities outside the USA. These long-term projects also provide training in fundamental and applied science, including biotechnology.
- The National Institute of Food and Agriculture administers funds provided

by several other agencies in the USA for research and training in programmes designed as country-led initiatives.

Many of the USDA's programmes are best described as translational: they convert fundamental research into practical, targeted applications with a direct benefit for health or well-being. They include basic research and training in molecular genomics, the use of advanced breeding tools in plant improvement, genetic engineering of plants, and greenhouse and field evaluation of crops. They also provide training in natural resources and water management, agricultural statistics, economics and rural development.

The National Science Foundation: another research player

The US National Science Foundation (NSF) is another valuable contributor in a number of ways:

- Encouraging and facilitating collaboration between scientists in US universities and research institutions, and between scientists in developing economies and US public-sector researchers. The areas supported by the NSF include plant genomics, genetics and genome evolution, cell biology, biochemistry and other disciplines. The projects funded may involve plant biotechnology and genetic engineering.
- Administering programmes funded by non-NSF sources. One is the BREAD (Basic Research to Enable Agricultural Development) initiative, funded by the Bill and Melinda Gates Foundation, which is designed to support innovative basic research into the key constraints on smallholder agriculture in the developing world. This fundamental work feeds into agricultural improvements through advanced and molecular breeding.
- Another programme is PEER (Partnerships for Enhanced Engagement in Research) funded by the US Agency for International Development (USAID), which has a long history of supporting the development of agriculture-based economies. Its projects have been an important mechanism for training students and other scientists from less developed countries in US institutions in areas such as advanced breeding and GM technologies, and food safety.

University inputs and USAID

The US Agency for International Development also funds research and training programmes in biotechnology at leading universities in the USA, which, in turn, further similar work at universities and research institutes in the developing world.



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The BREAD initiative (Basic Research to Enable Agricultural Development), funded by the Bill and Melinda Gates Foundation, is designed to support innovative basic research into the key constraints on smallholder agriculture in the developing world.

Along with science and technology, these projects also embrace product biosafety and regulation.

Feed the Future is USAID's most recent initiative, working with ministries in developing countries to achieve food security and build agricultural economies. The approach to improving productivity and marketing is sometimes conventional, sometimes innovative through biotechnology and information technology.

Another recent USAID programme is its Grand Challenges for Development, which enlists scientists and technologists from a variety of disciplines in the USA to find new solutions to both old and new problems in developing countries.

Private-sector involvement

Alongside the work of the US government is support for research from foundations, such as Gates, Ford, Rockefeller and Templeton, private-sector companies and individual donors. These have supported agricultural research, training and capacity building in developing countries, covering advanced plant breeding, biotechnology and other innovative methods for enhancing food production.

Some of the projects funded by the Bill and Melinda Gates Foundation are in collaboration with private companies or foundations. Sometimes this means direct funding, sometimes donations of intellectual property, technical knowledge or services. An example is Golden Rice, which began as a collaboration between Swiss scientists and the Syngenta company. The new rice required more than 40 different patents to reach its goal of high levels of provitamin A. These were donated by different sources, as were funds for related laboratory, greenhouse and field research.

Another variant is public-private partnerships in agricultural biotechnology, with private firms supporting public-sector researchers, sometimes in developing countries. Over the past 20 years, many such bilateral or multilateral projects have been funded though, so far, none has resulted in biosafety approval and the commercial release of an agricultural product developed through biotechnology. Lack of biosafety regulations in developing countries, or the unfamiliarity, complexity and/or cost of regulating such products, may be to blame for this.

The African Orphan Crops Consortium (AOCC) established a public-private partnership in 2014 to help improve the livelihoods of Africa's smallholder farmers and their families, reduce hunger and boost Africa's food supply. Its goal is to use the latest

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scientific equipment and techniques to genetically sequence, assemble and annotate the genomes of 100 staple African food crops to guide the development of more robust produce with higher nutritional content. The consortium includes the African Union's New Partnership for Africa's Development (AU-NEPAD); Mars, Inc.; the World Agroforestry Centre (ICRAF); BGI; Life Technologies Corporation; World Wildlife Fund; University of California, Davis (UC Davis); iPlant Collaborative; and Biosciences eastern and central Africa–International Livestock Research Institute (BeCA–ILRI Hub).

Promoting regulatory systems and trade

The food price crisis of 2007–2008, driven by a number of export bans, led to higher prices on the global market and food shortages in many parts of the world, resulting in protests and sometimes violence. Agriculture suddenly came back on the global agenda of priority issues facing governments, highlighting the role that trade plays in either undermining or promoting food security.

The continuing high price of food puts the USA in a quandary. On the one hand, its farmers enjoyed an export boom of US\$ 137.4 billion in 2011 – some 20 billion higher than the previous year. But high prices have had a negative effect on global food security, pushing even more people into poverty and hunger. Since nearly half of US agricultural exports consist of – or contain – biotech commodities, the USA has an interest in ensuring that countries around the world have sound regulatory systems for promoting free and fair trade in agricultural products.

So, the US government works with developing countries to establish approval mechanisms for both importing and producing GM crops. Partnerships have been formed between USAID and a host of international and regional organisations to strengthen environmental and food safety policies. Building local capacity, including trained staff, to develop science-based regulations covering GM crops is a particular aim.

Cooperation for trade

Alongside these regulatory activities, the USA has been forming bilateral, trilateral and multilateral networks for promoting trade in – and cultivation of – GM crops.

Again, USAID is actively supporting regional organisations in Africa and Asia as they move towards biotechnology policies, engaging in policy dialogues that promote harmonisation of regulations and information sharing.

The USA is helping to set up an African/European research partnership to explore the scientific and technical issues of biotechnology, including water management.

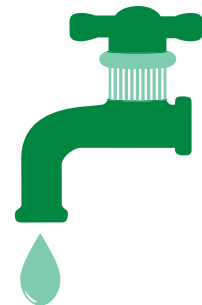
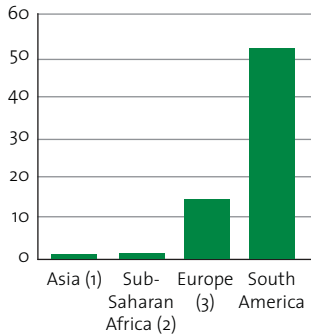


Figure 18.1 Average size of agricultural holdings

Selected regions, hectares



1 Excluding Japan and the Republic of Korea

2 Excluding South Africa

3 Including Russia

Source: FAO

Dialogues have also taken place with the European Commission since 1990, with an EU-US Task Force on Biotechnology Research. Here, however, the focus is not so much on trade as on the scientific and technical issues arising from biotechnology. Senior representatives from the European Commission, the African Union Commission and science ministries from both continents have agreed to set up a research partnership to tackle key issues. Focus areas are set to include the sustainable enhancement of the agricultural and food chain in Africa; the role of small and family farms in food and nutrition security; and water management for sustainable agriculture and food security.

The USA also has links with China through technical and biotech working groups, and discussions on agriculture, commerce and trade. And it has less formal links with countries such as Australia, Brazil and New Zealand that have common interests in a sound regulatory system.

Multilateral organisations

The USA actively participates in multilateral bodies involved in GM technology, regulations and policies, such as the Cartagena Protocol on Biosafety and the Convention on Biological Diversity. It also plays a very active role in meetings of the Codex Alimentarius Commission and its committees. This was established by the Food and Agriculture Organization and World Health Organization in 1963 to develop harmonised international food standards, guidelines and codes of practice to protect consumers' health and ensure fairness in the food trade.

The Codex Alimentarius Commission has taken up the question of GM standards over the past decade or so, establishing two biotech task forces that have:

- successfully established principles and guidelines for assessing the risk of GM crops including nutritionally enhanced plants;
- created guidelines for risk assessment where unapproved GM products are present at low levels.

The Codex Alimentarius Commission has not always been productive, however. Its committee on labelling foods derived from modern biotechnology laboured for nearly 20 years without coming to clear-cut conclusions.

Settling differences?

There are clearly differences between regions and countries in their approaches to GM products. The European Union (EU), for example, stands out as having a

moratorium on approving them. The USA has been a front runner, along with Canada and Argentina, in the establishment of the World Trade Organization's Dispute Settlement Body that called for the EU to comply with WTO obligations.

The Settlement Body noted that the EU's moratorium and its Member State bans were inconsistent with the EU's own safety assessments. But the dispute rolls on, with the USA continuing to urge the EU to remove barriers to GM products from its approval system.

A sense of urgency

The position of the USA on GM crops and food is unequivocal. It regards them as an integral part of its own agricultural system, with a vital role to play in increasing global crop productivity. It has the research experience, infrastructure, capital and capacity to support emerging economies in adopting and implementing the new technologies. It also has the capacity to provide and encourage training in science-based methods for evaluating the safety of biotech products.

Meeting global food needs and building worldwide food security are, it believes, a matter of urgency. Any barriers to trade that reduce access to food should be broken down as soon as possible. The world needs safe and affordable food, with GM crops playing their part in supplying it.



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Teff, an African orphan crop rich in calcium, grows from sea level to 3,000 metres. It is made into flour for injera bread or eaten as porridge, and is used to make beer and other alcoholic drinks.