



# **Status of Agricultural Biotechnology in Thailand**

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# Agriculture in Thailand

- Thailand has been an agricultural society due to the country's well-endowed natural resources and diverse crops. The major crops are rice, cassava, para rubber, oil palm, sugarcane, corn, tropical fruits and orchids.
- Agriculture in Thailand is highly competitive, diversified and specialized and its exports are very successful internationally.





**Biotechnology has considered as an important opportunity** for Thai agricultural. The National Science, Technology and Innovation Policy and Plan (2012-2021) has established aims target for R&D of food and agriculture as follow;

- ☑ Help assure food security for a growing global population responding to myriad of climate change.
- ☑ Advance market competitiveness and strengthen agricultural sustainability by increasing quality, productivity and innovation while reducing costs.
- ☑ Increase biotechnology's role to raise food production efficiency contribute to environmentally responsible and sustainable agricultural production.
- ☑ Improve agricultural quality and productivity through genetic improvement, quality and safety controls, nutrient labeling and product diversification and innovation.





# Biotechnology R&D

Research activities on plant biotechnology and genetic engineering have been focused on molecular marker and transgenic plants with superior properties including diseases resistance, insect pests and abiotic stress tolerance such as drought tolerance etc.)

- **In vitro Culture Technique** for Micro propagation and Breeding
- **Gene and genome technology** in combination with conventional plant breeding such as Molecular marker assisted selection for improvement crops ex: high protein soy variety, oil palm quality variety
- **New Breeding Techniques (NBTs)**, genome editing Lead to increase productivity in climate change conditions, drought tolerance etc. *However, conducted only in the bio-safety labs and/or greenhouse.*



# Status of GM crops in Thailand



Do not permit to grow GM crops commercially in the country



Importation of GM seeds only allow for research purpose under Plant Quarantine Act. regulated by Department of Agriculture.



GM soybean and corn grains are permitted to be imported for foods, feeds and industrial purpose



The FDA notified a labelling regulation for food containing ingredients derived from GM soy and corn. (Threshold 5%)

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# Status of GM crops in Thailand

## R & D

For example,

- Papaya ringspot virus resistant papaya
- Delay ripening papaya
- Chilli vein-banding mottle virus resistant chilli
- Herbicide tolerant pineapple
- Tomato yellow leaf curl virus resistant tomato

## Field Trial

- Only Papaya ringspot virus resistant papaya went to field trial in 1997.
- In 2001, GM plant experiments were put on hold following a decision by the cabinet.

## Commercialize

Thailand has not approved any commercialization of GM crops for cultivation.

Resistant to tomato yellow leaf curl virus



Thailand has multiple government agencies regulate LMOs and derived products.

<b>Government agencies</b>	<b>Roles/Activities</b>	<b>Responsibilities</b>
Ministry of National Resources and Environment (MONRE)	National Focal Point (CBD, CPH) /Coordinator for risk assessment on environmental aspects	Drafting the National Biodiversity Act. With a part of biosafety regulation section.
Ministry of Agriculture and Cooperative (MOAC) DOA, DOF, DLD, ACFS	Competent national authority Research and Development (Plants, Fisheries, Animals,)	Regulate GM plant under Plant Quarantine Act. Regulate Field Trial under IBC/cabinet decision Environmental Risk Assessment
Ministry of Public Health (MOPH) FDA	Regulate trade on GM Food products for consumption	Regulate and monitoring GM Food and labelling under Food Act. 5% threshold
BIOTEC (National Center for Genetic Engineering and Biotechnology)	Technical Expertise Research and Development	R & D on genetic engineering Technical advisory for new technology, commercial scales



# Biosafety Legislations

## 1. Existing biosafety related laws

- **Plant Quarantine Act** B.E. 2507 (1964) amend (No.2) B.E. 2542 (1999); amend (No.3) B.E. 2551 (2008) : to prohibit 33 species 51 genus and 1 family to be imported into the Kingdom except for R&D.
- **Plant Act** B.E.2518 (1975) amend (No.2) B.E. 2535 (1992) : Notification prescribing the kinds and varieties name of plants as controlled seed, for commercial purpose collects, sells, imports, exports or brings in transit controlled seed
- **Plant Variety Protection Act** B.E. 2542 (1999) : to register and assess for potential risk of living modified plants.
- **Food Act** B.E. 2522 (1979) :to label food containing ingredients (e.g. soybean & corn starch) derived from GMOs.

## 2. **Biosafety Guidelines** : Guidelines for R&D, Food biosafety guidelines, guidelines for industrial application of GM microorganisms





Thailand recognizes the importance of genome editing technology. The regulation policy for genome editing is under discussion and consideration. **The regulatory preparation for research, development and utilization of genome editing technology.**

- Gather the requirements of various countries regarding genome editing, especially the technical criteria to consider.
- Organize a focus group with additional experts to propose criteria for consideration.

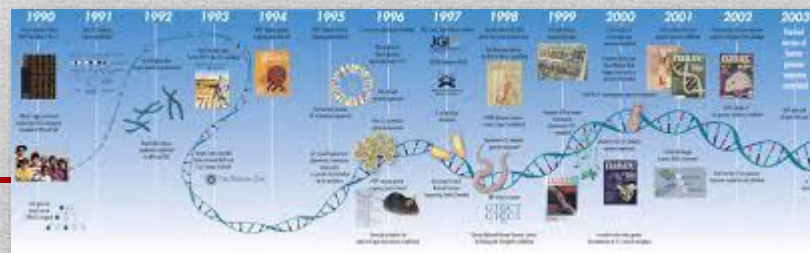


# Agricultural Biotechnology for Future

Thailand are on going established the Biodiversity Act. to be national legislation for LMOs regulation.

Thailand also need to harmonize cooperation and regulation including;

- Reduce regulatory disparities between countries and set up clear policy of national regulatory and facilitate international trade.
- Simplify an inefficient regulatory frameworks and reform the outdated regulations and complex measures.
- Review / improve / expedite laws / regulations cover all activities from research to commercialization.
- Public awareness building on risk and benefit of new breeding technologies.







**THANK YOU**