Benefits and risks of genetically modified crops in Asia

The UN Food and Agricultural Organization (FAO) estimates that global food production will need to increase by 40% by 2013 to support much of the population growth. It is a matter of urgency, therefore, to establish sustainable food security systems in Asia and the Pacific region. Compounded with a dwindling natural resource base during a time of global warming and climate change, food productivity increases with genetically modified (GM) crops and global agriculture becomes one of vitally important means to ensure sufficient availability of food and other raw materials for the growing population.

The first GM crops became available in the mid-1990s. Since then, the adoption and commercial planting of GM food crops are on a rising trend globally, making an important contribution to the development of crop production systems that reduces the risk of crop losses due to insects and weeds, or site directed mutagenesis, an opportunity becomes available to incorporate more than 15 years of commercial production of GM crops with greater precision of the science into the evolution of regulatory policies.

But the development of GM crops has raised some concerns about their potential adverse effects on human health and environmental integrity. It is therefore imperative for producers, consumers, regulators and other stakeholders in Asian countries to understand the potential and regulatory implications of this new trend. To address the concerns, this workshop tackled the latest development and safe use of GM food crops through oral presentations, poster presentations and candid discussions. With new generations of genetic tools presented in the workshop, such as genome editing and commercial planting of GM food crops are on a rising trend globally, making an important contribution to the development of crop production systems that reduces the risk of crop losses due to insects and weeds, or site directed mutagenesis, an opportunity becomes available to incorporate more than 15 years of commercial production of GM crops with greater precision of the science into the evolution of regulatory policies.
Major findings and recommendations:
For the further use of GM crops in the future, the workshop participants call for special attention to the following recent developments:
• US plant pest approach to GM crops and current issues related to various types of newly developed crops;
• Regulatory challenges by increasing stacked events and novel traits which lead to longer period for authorization;
• Development and broadening of European environmental risk issues from the viewpoint of the EFSA guidance documents; and
• EU regulators various approaches to coexistence issues based on science/regulatory interaction.

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Held in Tsukuba, Japan, 8-10 October 2013
No. of participating countries: 13 (Australia, China, India, Indonesia, Japan, Korea, Netherlands, Pakistan, Philippines, Thailand, Taiwan, United States and Vietnam)
No. of papers presented: 22
No. of participants: 22 resource speakers from 13 countries
Co-organizers: National Institute for Agro-Environmental Sciences (NIAES) and National Institute of Agrobiological Sciences (NIAS)

List of papers
1. GM crops for food security in developing countries
   - Josette Lewis
2. Commercial GM food crop production and its future perspective
   - Randy Anoche Hautea

Resource papers
1. Targeted modification of plant genomes
   - Seiichi Toki
2. Development of resistant rice using WRKY45, a key transcription factor of rice defense mechanism
   - Hiroshi Takatsuji
3. Current status of late blight resistant (LBR) potato research in confined field trials in Indonesia
   - Muhammad Herman
4. Transgenic papaya for ring spot virus resistance
   - Parichart Burns
5. Herbicide resistance in canola: an
essential tool for weed management in Australia
- Christopher Preston

6. Insect resistant eggplant expressing Bt genes in India
- Leelavathi Sadhu

7. Field trials of insect resistant maize expressing Bt gene in Vietnam
- Nguyen Van Liem

8. Maize stacked with genetically modified events in the Philippines
- Saturnina Halos

9. Development of marker-free transgenic plants
- Ayako Nishizawa-Yokoi

10. Cloning and expression analysis of genes and field evaluation of salt tolerant genetically modified wheat (Triticum aestivum)
- Nasir Ahmad Saeed

11. Exploiting drought-inducible genes encoding transcription factors for drought tolerant crops
- Kazuko Yamaguchi-Shinozaki

12. GM corn expressing phytase gene in China
- Rumei Chen

13. MIPS and PAP genes in mungbean: paying the way to success in friendly environment and improving animal nutrition
- Sutkhet Nakasathien

- Fumio Takaiwa

15. Oral immunogenicity of porcine reproductive and respiratory syndrome virus antigen expressed in transgenic plants
- Pung-Ling Huang

16. Comparative analysis of nutritional composition of β carotene biofortified rice with phytoene synthase and carotene desaturase genes and its non-transgenic counterpart
- Jae Kwang Kim

17. General view of environmental impact assessment of genetically modified crop
- Yashuhiro Yogo

18. Safety assessment of GM food crops and derived food and feed
- Willem Seinen

- Masashi Tachikawa

20. Biological impact assessment for genetically modified crops and their proper managements in Japan
- Hiroyuki Shibaike

The workshop serves as an avenue for experts to discuss the safety assessments of GM food crops and its environmental impacts.

Workshop participants observe the experimental field trials of some GM crops during their educational tour.