

## Guest Editorial

# The biosafety policy on genetically modified organisms in Turkey

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### Assessment of biodiversity and its sustainability

Turkey has 75% of the total number of plant species found in Europe. It is this exceptional amount of biodiversity that places a huge responsibility on Turkey, to ensure that these species are adequately protected in order to prevent them from being endangered or becoming extinct. Of particular importance are species related to the crops on which much of world agriculture depends.

Many of the formal descriptions of Turkey highlight several distinct biogeographic regions, each with its own endemic species and natural ecosystems, *i.e.* the Caucasian Mountain forests with its temperate deciduous forests, alpine meadows, the Central and Eastern Anatolian steppe grasslands and the Mediterranean region, which includes the world's largest remaining forests of cypress (*Cupressus sempervirens*) and Lebanon cedar (*Cedrus libani*).

Turkey is one of the leading countries for known plant endemism; about 33% of the plant species in the flora are endemic to Turkey. The richest family for endemism in Turkey is the *Compositae* having a total of 431 species, 40% of which are endemic. Of the 400 species of *Leguminosae*, 41% are endemic, and of the 306 *Labiatae* species, 57% are endemic. Also, there are ten genera that are entirely endemic to Turkey.

Turkey is at the crossroads of two important *Vavilovian* gene centers – The Mediterranean and the Near East – each important for the origin of field crops as well as horticultural plants. There are five “micro-gene centers” in Turkey. The cultivated plants originating in Turkey include species in the genera *Linum*, *Allium*, *Hordeum*, *Secale*, *Triticum*, *Avena*, *Cicer*, *Lens*, *Pisum*, *Vitis*, *Amygladus*, *Prunus*, *Beta*, etc. Cherries, apricots,

almonds and figs all originated in Turkey. The Turkish flora includes many wild relatives and also a rich genetic diversity of important domestic species (*e.g.* wheat, chickpea, lentil, apple, pear, apricot, chestnut, and pistachio). Turkey is also home to a number of ornamental flowers, the most notable of which is the tulip. Among continental countries, Turkey ranks 9th in terms of biodiversity richness (Haspolat, 2004; MARA, 2005b).

The most critical question in making decisions concerning the production of GMOs in our country is whether the cultivated variety has wild relatives, and if they are at a high risk of being affected by GMOs. In addition, the diversity of local varieties, such as wheat landraces, must not be damaged, and the continuity of biological diversity should be maintained after decisions regarding GMOs have been taken. At present, the production of GMOs is prohibited in The Mediterranean regions and near gene centers. Risks that result from gene flow from GM crops will vary according to environmental conditions, which are highly diverse in Turkey. Thus, to prevent negative impacts, each GMO should be examined case by case and fastidiously before releasing it into the environment. Clearly, the present laws related to biodiversity to ensuring the sustainability of biodiversity in Turkey are not adequate. A national biosafety law is needed urgently.

### Regulatory regime

The policy of Turkey is to protect its biological diversity, as well as human and animal health, against the possible adverse effects of products developed by using modern biotechnology; however, it is also important to benefit from the current and future advantages of modern biotechnology applications, as long as this is done safely in accordance with national requirements.

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The main principles of the biosafety system are the precautionary principle, case-by-case evaluation and strategic long-term risk assessment of GMOs, including their impacts on socio-economic structures.

Even though Turkey has not yet authorized the import or domestic production of any transgenic seed for environmental release, the pending applications received in 1998 have been evaluated by the Ministry of Agriculture and Rural Affairs (MARA) with respect to the field trials of cultivated transgenic plants, but decisions could not be finalized due to the legislative, administrative, institutional and technical gaps on biosafety. However, meanwhile field trials of cotton, corn and potato by the Agriculture Research Institute have been authorized by MARA (1998; 2005c).

As a party to the Convention on Biological Diversity (CBD) since 14 May 1998, and as a participant in the process of preparation of the Cartagena Protocol on Biosafety since 1998, the Republic of Turkey signed the Protocol on 24 May 2000 during the 5th COP to the CBD and adopted it on 17 June 2003 (act 4898, OJ 24 June 2003). The General Directorate of Agricultural Research of MARA has been appointed as a national focal point for the Protocol (MARA, 2005a).

In addition, Turkey participated in the UNEP/GEF project on the development of National Biosafety Frameworks, which was also supported by the State Planning Organization. Since the current legislative and institutional system was not considered to be adequate for the implementation of the Protocol, the participants agreed on the need for a stand-alone biosafety law, and they have established a commission to prepare a draft law on biosafety and the relevant institutional system. Currently, the draft law is under the consideration of the relevant national organizations.

The regulatory system should include complete administrative, legislative, institutional and technical regulations and organizational structures necessary for the advanced determination, delaying and/or minimizing, and controlling the possible or unforeseen adverse effects of GMOs and products thereof. MARA is responsible for the gathering, processing and dissemination of information and data on biosafety. It is necessary to fulfill several requirements regarding biosafety, including:

- training of the staff on electronic data management and information systems;
- establishment of a computer network system;
- preparation of standard data and information collection forms, including a coding system to secure confidential information;
- determination of regulatory measures and differentiation of the access modules for access of the competent authorities and public to the relevant information;

- determination of responsible bodies in related institutions, in order to ensure regular data and information collection and dissemination.

### **Public awareness, education and participation**

It is presently not possible to determine the exact opinion of the Turkish public about GMOs and GMO-derived products, due to the lack of information or misunderstanding of the issues on GMOs and on biosafety in general. In public meetings and programs, the debate is usually focused on diverse food safety and environmental issues. While the consumer organizations have questions about the safety of GMOs and their products on human health, the civil associations on environment are more sensitive about biological diversity. On the other hand, the private sector is keen to import GMOs into Turkey. The need for raising the awareness of public on the issues related to GMOs in an objective manner was underlined during the execution of the national biosafety project. Regional meetings and the publications produced in the context of the project have provided an opportunity to go forward on the subject. As a consumer, everyone has the right to know what they are eating, and the right to have the information to decide if they want to eat it. However, it is still early to ask for the opinion of the public about GMOs before the announcement of the basic components in the formation of risks and benefits in a more scientific manner (Eser and Kiliçarslan, 2005).

The biosafety regulations in Turkey will be harmonized with the EU directives, and thus labeling will be required. Presently, food safety, health and environmental protection, and the rights of public institutions to be informed, are ensured by the relevant Turkish law (4982 numbered Information Obtain Right Law). The law regarding Consumer Protection (Law no 4077) says that when the goods and services presented to consumers are dangerous for physical and psychological health or the environment, in order to use these products securely, explanatory information and warnings should be written on products or in their manuals. However, there is no specific law regarding the labeling of GMO or products. In addition, there has been a decision to create a specific ethics committee for determination of the ethics situation related to GMOs in Turkey.

### **Social-economic assessment**

There are concerns about economic impacts in Turkey. In order to address these concerns, comparative economic analysis resulting from field tests should be made, especially between traditional and transgenic products. Thus, the benefits and costs of giving permission to produce or utilize transgenic products at the micro (producer)

and macro (sector and country) levels could be evaluated. This would improve the clarity of policy alternatives regarding transgenic products, and should facilitate decision-making on a rational basis.

Because of these many diverse issues, genetic modification is an issue of some strong debate in Turkey. Concerns include ethical issues related to potential long-term health effects, labeling, and potential environmental risks. Biotechnology also has the potential of creating major advances for agriculture and other related topics. For these reasons, Turkey, which ranks 9th in terms of biodiversity richness, must be sure that all the safety bases are covered. The procedures for legal regulation at both the national and international levels are currently being put in place in Turkey. In addition, it is anticipated that the protection of the unity and the validity of contributions to health and scientific, environmental and economic topics will be more effective with public participation. Public education and contribution will provide benefit to continue legal developments and to implement biosafety subjects.

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