

## ASPB STATEMENT ON PLANT GENETIC ENGINEERING

Technical advances in agriculture, coupled with time-honored methods, provide the best opportunity for world food supplies to meet the demands of an ever-growing world population, while protecting our environment and natural resources. The American Society of Plant Biologists (ASPB) submits this statement supporting the continued, responsible use of new technologies, such as recombinant DNA technology (hereafter referred to as "genetic engineering" or "GE"), which can add effective tools to those needed to combat hunger and maintain a healthy environment. ASPB also supports the continued use and further development of rigorous and responsible science-based procedures to assess the risks and benefits of the technology and its products.

The use of GE to modify plants represents a significant advance in plant science, building on centuries of human involvement in the genetic modification of crop species. It allows for the transfer into a plant of specific, characterized genes under known regulatory control. The precision of this technology coupled with the knowledge of the specific nature of the manipulated genetic information make the risks of unintended consequences of this type of gene transfer comparable to the random mixing of genes that occurs during classical breeding (National Research Council and Institute of Medicine of the National Academies 2004).

The rapid adoption of the first generation of these crops, made tolerant to certain pests or herbicides, underscores the benefits that can accrue to users. Early data indicate that some farmers have realized reduced pesticide use, increased crop yield and facilitated weed control leading to a reduced need for soil tillage (Fernandez-Cornejo and McBride 2000; Huang et al. 2005; Toenniessen et al. 2003; Qaim and Zilberman 2003; Fawcett and Towery 2002). Such advances complement other sustainable agricultural practices and can lead to significant environmental benefits, such as decreased soil erosion and a reduced use of synthetic pesticides.

Modified crops resulting from plant biotechnology are also expected to provide major health benefits to people throughout the world. Examples include enhancing the vitamin and mineral content of staple foods (Ye et al. 2000), eliminating common food allergens (Buchanan 2001; Cho et al. 1999), developing higher protein quality and quantity in widely consumed crops (Wu et al. 2002) and modifying plants to contain vaccines against many illnesses (Arntzen 1997). GE crops are now also being developed for enhanced tolerance to environmental stresses such as submergence, which disproportionately impact the world's poorest farmers (Xu et al. 2006). In many cases, conventional breeding cannot achieve such improvements. In the future, GE plants are also expected to be useful in nonfood applications, such as phytoremediation (Meagher 2006), where plants remove contaminating pollutants from soils and water resources and serve as biofactories to create compounds presently made using nonrenewable resources, e.g., industrial oils and fuels.

Responsible use of new plant biotechnologies could contribute to a more sustainable and environmentally compatible agriculture. Responsible development and use of modified plants are essential to protecting the quality of life and the environment for an ever-growing world population.

Concerns raised about this technology and its products include food and environmental safety issues, as well as socioeconomic and ethical matters. To the extent that scientific data can be gathered to address these concerns, the ASPB supports and encourages such investigations. Regulatory agencies now mandate extensive safety testing of new biotechnology-derived food products, in fact, this testing far exceeds that of foods created by classical breeding. Consumer confidence is paramount to the acceptance of the products of biotechnology. It is imperative that the extensive federal regulatory framework presently in place be maintained and regularly reviewed to determine whether additional scientific data are needed to address consumer concerns.

A number of expressed environmental concerns currently raised as potential problems with GE plants are also potential problems with conventionally bred plants and traditional agricultural practices. For example, gene transfer to compatible wild species, development of pesticide-resistant insects and possible adverse effects on genetic diversity need to be closely monitored by scientists and regulators. In addition to the oversight of modified crops by federal regulatory agencies, ASPB encourages rigorous independent studies by third-party researchers.

To ensure the continuation of these standards of safety, ASPB strongly endorses continued responsible development and science-based oversight of GE and all food production technologies and practices on a case-by-case basis. Additionally, ASPB is dedicated to providing science-based information needed for the government, the private sector, individuals and other stakeholders to make informed choices about the products resulting from biotechnology. The ASPB believes strongly that, with continued responsible regulation and oversight, GE will bring many significant health and environmental benefits to the world and its people.

## References

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