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Statement by the German Academy of Sciences Leopoldina – National Academy of Sciences, the German Academy of Science and Engineering acatech and the Berlin-Brandenburg Academy of Sciences and Humanities (on behalf of the Union of German Academies of Sciences and Humanities)

In support of a new policy on Green Genetic Engineering[1]

Since its beginnings in the 1970s, genetic engineering has become what is probably the most important tool used in biomedical research and has led to a major growth of knowledge with a wide range of impacts on industry and society. Whereas the strictly controlled use of genetic engineering in industrial microbiology and medicine ("White" and "Red" Genetic Engineering) is generally accepted in Europe, the production and use of genetically modified plants ("Green" Genetic Engineering) is markedly restricted by the political framework conditions that have been implemented. In consequence, relevant research is blocked to a large extent.

The higher education and research organisations (see "Gemeinsame Erklärung aller großen Wissenschaftsorganisationen Deutschlands" (joint declaration of all major higher education and research organisations in Germany)) of the 16.4.2009 in the Federal Republic of Germany have repeatedly called on the Federal Government *"to enable not only research in Green Genetic Engineering but also its applications in Germany".* Nobel Prize-Winner Christiane Nüsslein-Volhard sums up the opinion of the scientific community in stating that: *"Germany has so far failed to sufficiently accept that applying genetic engineering in plant breeding offers an as yet not fully tapped potential for organic farming, improved environmental protection, the conservation of biodiversity and health. Plants that are resistant towards moths, fungal infestation, viruses and nematodes need not be sprayed. Plants that are better adapted to unfavourable growth conditions, saline soil and karst and arid regions can thus be bred and grown to turn barren land back into fertile land."* [2] And she goes on to say that: *"We are in the process of exporting excellently qualified researchers instead of highly advanced seed and agricultural technologies."*

The scientific community calls for a well-considered and sensible employment of Green Genetic Engineering in combination with other plant breeding methods and depending on local conditions. Researchers have not ignored the concomitant problems. But since modern plant research relies on field trials, maintaining the present intensity and high quality of research will not be possible in our country if it continues to be treated as it is now. By contrast to the situation in Germany, promising genetic engineering research projects reaching beyond optimising plants as food and fodder are in

[1] The German Research Foundation (DFG) will shortly be issuing a booklet explaining the opportunities and risks of Green Genetic Engineering in a generally intelligible form and considering new scientific insights in various disciplines. On this, also see the volume: "Grüne Gentechnik, Aktuelle Entwicklungen in Wissenschaft und Wirtschaft – Supplement zum Gentechnologiebericht, Forschungsberichte der Interdisziplinären Arbeitsgruppen der Berlin-Brandenburgischen Akademie der Wissenschaften" (Green Genetic Engineering, the latest developments in science and industry – supplement to the report on Green Genetic Engineering, research reports of the Interdisciplinary Research Teams of the Berlin-Brandenburg Academy of Sciences and Humanities, Elsevier, 2007.
[2] Nüsslein-Volhard, "Wachstum in Natur und Kultur" (growth in nature and culture), lecture given at the Congress of the Society of German Researchers and Physicians, Tübingen, 19th September 2008.

progress world-wide. These include attempts to produce biofuels more efficiently by using e.g. lignocelluloses and thereby avoiding competition with important food plants. Finally, it must not be ignored that modern agriculture cannot attain the goal of sustainability without state-of-the-art plant breeding methods, including genetic engineering.

For all these reasons, the German Academy of Sciences Leopoldina – National Academy of Sciences, the German Academy of Science and Engineering acatech and the Berlin-Brandenburg Academy of Sciences and Humanities (on behalf of the Union of German Academies of Sciences and Humanities) are again calling for the safeguarding of field trials to support Germany's excellent basic and applied research on plants and facilitate the translation of results into practice, thus creating the opportunity for Green Genetic Engineering to fulfil its potential and emerge in our country.

For policy-making in practical terms, this means:

- **Creating reliable framework conditions**
  Research and industry require reliable, scientifically-based framework conditions, acceptable to scientific institutions and medium-sized enterprises in financial and administrative respects, in order to progress understanding of the prospects of Green Genetic Engineering and guarantee varietal diversity. At the same time, specific requirements for those genetically modified plants that are permitted for cultivation must be modernised to conform to new standards developed on the basis of generally accepted scientific insights.

- **Practicable threshold values are needed to allow for further research and secure the future raw materials**
  The issue of threshold values, i.e. the permitted percentage of genetically modified hereditary material in a product, is of special importance to industry as well as to science and research. For example, German and European food and food processing industry relies on the import of agricultural raw materials (currently particularly for the use of fodder). An achievable legal framework needs to be created for the commodity chain that is guided by the world-wide developments in Green Genetic Engineering, proven scientific insights and international trade. This is why binding and practicable threshold values for the accidental, adventitious, technically unavoidable presence of genetically modified organisms (GMOs) in conventional seed are indispensible in addition to the threshold value of 0.9% for the labelling of food and fodder valid in Europe. Furthermore, a threshold value of minor additions of GMOs not registered or permitted in the EU or asynchronously permitted in individual EU countries is needed.

- **Accelerating the EU approval procedures in permitting new, genetically modified varieties**
  The Federal Republic bears a considerable degree of shared responsibility for the long-lasting delay in approval procedures for genetically modified plants by the European Union. This particularly applies to approval procedures for commercial cultivation. In future, new varieties authorised according to science-based procedures and assessed as safe have to be swiftly approved in order to avoid Europe falling further behind in world-wide competition.

- **Amendment of the German Law on Genetic Engineering**

  - Placing on the market
  The concept of „placing on the market“ is intended to be used in the context of commercial use. As such it is an obstacle to scientific field trials and needs to be corrected in the interest of freedom for science and research. It needs to be clarified that DNA traces of genetically modified plants in conventional products resulting from an approved release are not subject to the regulations of „placing on the market“.

  - Amendment of the liability regime
  This means that a research institution or a farmer is liable for damage that they have neither caused nor bear responsibility for. It is incomprehensible that genetically modified varieties that have been authorised for cultivation via a strict approval procedure are regarded as hazardous materials. Genetically modified varieties that have been approved for sowing must not be treated differently regarding legal liability from other seed and plants.

  - Location register and crop separation distance
  The regulations in force on the location register, in particular the exact designation of field plots as publicly available information and the registering of personal data, represent a violation of basic rights. The data are often abused and have resulted in a large number of crops being destroyed. The three-month limit for registering is impractical and ought to be restricted to one month. The specified crop separation boundary for maize (150 m to fields with conventionally grown maize and 300 m to maize fields under organic cultivation) is neither scientifically based nor has it been validated in practice and these separation distances should be reduced according to the scientific evidence.

Democratic politics cannot ignore the opinion of the electorate. But it also has a responsibility to inform voters of the facts. That is, it has an educational role that requires the support of science. The beneficial use of genetic engineering in the manufacture of drugs and food additives has generally been recognised, and today, it is accepted in our society. Green Genetic Engineering relies on the same methods with the aim of enabling breeding research to be carried out in a more focused and faster manner than the conventional techniques allow. This is why giving its products a negative label is misleading. Consumers ought to be informed about the reality that more than 70% of their food on the market today has been affected by genetic engineering in various ways, e.g. via animal feed, by food additives and medical drugs, without having an impact on their health or wellbeing. It has to be explained to the consumer that Green Genetic Engineering is not only used in the manufacture of food, but that it offers a wide range of other possibilities, such as extending the ecological growth zone of our cultivated plants and promoting biodiversity. The scientific and political communities should both seek to explain these contexts and campaign for this important research area with considerable potential for the future. By choosing this course, the political bodies have the opportunity to build legislation concerning an area with far-reaching and long-term consequences on a foundation of knowledge.

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