

**RAPPORTEUR'S ACCOUNT OF PROCEEDINGS OF
THE PLANT SCIENCE WORKSHOP
HELD AS PART OF THE UK PRESIDENCY BIOSCIENCE EVENT CONVENED
BY THE UK DEPARTMENT OF TRADE AND INDUSTRY, LONDON
ON 11 OCTOBER 2005**

1. INTRODUCTION

Chair of the session on Plant Science, Linda McAvan, Member of the European Parliament, welcomed participants and set the scene highlighting the Lisbon Agenda for the EU and its focus on the need for a competitive bio-based knowledge-economy. It was noted that the EU has world-class scientific and technical discovery in plant science. But there is a need to turn this knowledge into new and profitable products and services, while a flourishing agribusiness sector will be necessary to bring these developments to market. The aim of the session was therefore to explore how this could be achieved, i.e. how to realise the wealth of new products both to meet consumer demands and deliver improved industry competitiveness.

Piet Schenkelaars, an independent biotechnology consultant, then presented his study on the competitiveness of the agri-business research and development (R&D) sector in the EU, (commissioned by the UK Department of Trade and Industry). The main aim of the study was to inform the participants at this session about current trends and developments and to facilitate an exchange of views on how to improve further the competitiveness of this sector in the EU. In his presentation the focus was on the study's analysis of strengths, weaknesses, opportunities and threats (SWOT) and its recommendations.

The chair subsequently invited the participants to discuss the presented SWOT-analysis and revise if necessary. The SWOT analysis is reproduced below – new material suggested by participants is highlighted.

2. SWOT-ANALYSIS

STRENGTHS
<ul style="list-style-type: none">• The EU still has a strong world-class (basic) plant science and (applied) (bio)technology R&D, also in comparison to the US. But the EU is trading on a storehouse of accumulated expertise, which needs to be refreshed constantly by training new students.• In some EU member states, public and private sector parties have already made considerable advances on the learning-curve for successful plant science and (bio)technology R&D collaboration. It is however not clear how competitive the EU is, compared to the USA, Australia, etc., and the climate for partnership is not always optimal.• In the last 5 years the area of plant science has gained a much stronger backing from the European Commission. The launch of Technology Platforms has brought many different parties together at the EU-level, which hardly discussed with each other before. The European Research Area (ERA) Net Plant Genomics comprises public institutions and private sector parties, like major biotechnology companies, seed firms, new private-private R&D joint ventures and start-up companies from several EU member states, demonstrating an increased ability to extract value from scientific knowledge. Its excellence also attracts interests from countries outside the EU, like Norway, Israel, the US and China. Activities by the Technology Platform ‘Plants for the Future’ are complementary.• The EU has all elements of a major food economy and there is food of high quality in abundance in the EU. But given the current price war between operators in agri-food production and distribution chain, the question for the near future is whether companies will continue to invest in R&D in the EU. It should be noted that the (global) seed industry is tiny in comparison to major retail firms.
WEAKNESSES
<ul style="list-style-type: none">• The political climate for increasing public expenditure on science and technology is not conducive for R&D-driven innovation of the EU’s agricultural and industrial base.• Short-term political gains induces a negative stance towards plant (bio)technology innovations rather than taking a long-term view and a positive attitude. Political voices of dissent are much louder in the ears of politicians than those arguing the benefits.• The public in the EU are not particularly interested or connected to the current situation, as the majority has little idea about what they are eating these days. While engineering of food is not a new concept, education at school level is essential.• EU public and private sector parties have a substantially lower share of agrobiotechnology patents than their US counterparts.• In many EU member states national plant science and (bio)technology R&D programmes are rather fragmented. Although there is a balance to be struck between diversity and critical mass of funding. There is potential for further fragmentation in Europe as a repercussion of the enlargement process.• EU good at the development of concepts but weak in implementation.• A mix of retail interests, consumer concerns and the Common Agricultural Policy discourages farmers in the EU to adopt efficient agricultural systems.• The discussions on GM issues have polarised the debate in the EU.• In the EU farming is viewed too much only in relation to food production, whereas farming could also be directed at production of feed, fuels, pharmaceuticals and other speciality chemicals.• Powerful supermarkets – consumer labelling aimed at allowing consumers to choose resulting in no choice as retailers decide not to stock GM items.

OPPORTUNITIES

- Advances in plant science and (bio)technology R&D can contribute, through knowledge-based breeding, to diversified agriculture, forestry and industrial production systems that are more ecologically sustainable, with economic and societal advantages.
- New green industries and premium agriculture can emerge, which offer potentially attractive economic alternatives to generating food surpluses, thereby contributing to re-development of rural areas in the EU, through: 1) plants as renewable energy sources; 2) plants as renewable feedstock replacing petrochemicals; 3) plant and bioreactors for delivery of new pharmaceutical compounds, vitamins, pigments, fragrances, flavours and nutraceuticals, and; 4) plants tackling environmental pollutants.
- Rising oil prices and decreased ability to supply can make renewable, crop-derived industrial feedstocks more economically attractive, thereby enabling a shift from an economy based on fossil fuels to a knowledge-based bio-economy. **The energy crisis is creating discussion and debate about 'biomass' and second generation biofuels e.g. lignocellulosics**
- **Reform of the CAP will force thinking about what the farming community in the EU is going to do; it will need input from the plant science sector.**
- Public concerns and scientific perspectives on the potential risks and sustainability of GM crops in the EU can lead to safer and more sustainable innovations for European agriculture, including co-existence of farming systems with and without GM crops. Social science research can contribute to better governance and societal embedding of plant science-based innovations.
- **Networking and dialogue with different stakeholders can be achieved through various Technology Platforms. Though, it appears to be difficult to engage consumers (or consumer organizations) because of GM issues.**
- **EU supporting EPOBIO that will develop policy for the successful development of non-food crops across the EU.**
- **Globalisation – development of bioscience industry in China and India. The EU is good at partnerships.**

THREATS

- The unpredictability of the EU GMO regulations caused several multinational enterprises (MNEs) in (agro)biotechnology to move all their GM plant breeding R&D out of Europe to the US, as well as other countries, including Canada, Australia, China and India
- **While the EU has excellent plant science and (bio)technology research, its findings are picked up and utilised commercially by global MNEs.**
- Regulatory compliance costs in the EU regulatory requirements and liability risks are more disadvantageous for public R&D institutions and SMEs in the seed industry than for MNEs.
- Politicians and policy makers in the EU generally have a much lower awareness of the importance of plants and plant science and technology to the economy than their US counterparts.
- Students currently view disciplines like finance and law more attractive with a view to future career prospects than natural sciences and engineering.
- **The EU agricultural sector is losing competitiveness in a global market. While it has access to most technologies, like tractors, irrigation, etc., and high quality seeds, it does not have access to most GM seeds.**
- **The EU could become reliant on imports of 'quality' ingredients, e.g. edible oils with fatty acid compositions favourable to human health.**
- **The power of NGOs in the EU campaigning against GM crops and GM food and feed should not be underestimated.**
- **Chemical companies are reluctant to use biotech-derived products, and the pharmaceutical sector prefer chemical production via Good Manufacturing Practice or Good Large Scale Practice.**
- **Globalisation – development of bioscience industry in China, India and Russia.**

3. RECOMMENDATIONS

The Chair invited participants to consider the recommendations in the light of any revision of the SWOT analysis, with the aim to further improvement and refinement.

1. Raising political and public awareness and understanding: Politicians, policy makers and the public in the EU should be reminded of, as well as understand the vital role played by plants. They should also understand the crucial role of plant science and (bio)technology R&D in sustaining life and economies, also those of highly industrialised and urbanised societies. Moreover, they also need to be adequately informed about the need to further advance plant science and (bio)technology R&D in the EU. Moreover, they should also be much better engaged in discussing various economic, social and environmental issues, i.e. through better understanding and balancing potential benefits and risks. In addition, they should learn to understand that R&D trajectories in plant science and (bio)technology are relatively long compared to most other industry R&D sectors.

Participants agreed that this recommendation is critical but needs to be more strongly worded. A better understanding of the balance of risks and benefits is needed. Both private and public sector parties engaged in plant science and (bio)technology R&D need to communicate their visions and activities at a level that politicians and lay people can understand. It is vital that this communication starts early – at school and is focused on understanding and dialogue rather than just awareness.

2. Increasing and focussing public expenditure: Public expenditure on plant science and (bio)technology R&D should be increased substantially by many EU member states at the national and the EU-level, however, only if accompanied by appropriate innovation policies, which enable to extract value of scientific knowledge and public-private R&D collaboration. It is thereby essential to address current fragmentation of plant science and (bio)technology R&D both at the national level in most EU member states and at the EU-level.

Participants agreed this is an essential recommendation but that the focus should be on increased funding of (commercial) exploitation of plant science and (bio)technology R&D rather than ‘biosafety’. The ERA Net Plant Genomics and the Technology Platforms could be instrumental in this respect, while EU Member States could choose, in this context, to focus on particular areas that are close to their hearts and national needs. There is a need to benchmark the EU against the rest of the world. The ERA Net and Technology Platforms should also collect information, in order to assess advances made in plant science and (bio)technology R&D in other continents. In this context, it was noted that China and India constitute both a threat to the EU and an opportunity for collaboration.

Budget decisions for FP7 are currently being made and consideration is needed as to how to influence increasing plant science funding to the order of 5 billion EUR. However, as public research institutions and companies in some Member States are discouraged to participate in EU-funded R&D projects, given the great administrative efforts required and the relatively low level of success, it was suggested that the Commission review current complex administrative requirements for obtaining EU R&D funding. Funding is also needed for schools and education.

3. Improving stakeholder involvement: National public authorities must demonstrate leadership in engaging other stakeholders, i.e. the world of finance, as well as political parties and public interest groups, in the development and implementation of a strategic research agenda for plant science and (bio)technology R&D at national level and the EU-level.

Participants agreed this is essential. There is a need to better understand the perspectives of the new EU member states. While there is a need to engage stakeholders by agreeing clear roles and responsibilities, as well as acquiring their commitment to actions, it is also important to take decisions rather than prolonging debates. However, it is difficult to engage NGOs and consumer organisations due to staff shortages. There is a need to consider how to facilitate this process through close involvement with the Technology Platform.

The media has been very influential; journalists need to be educated so that they also understand the potential benefits and not just use the issue of potential risks as a basis for scare stories. There is a need to challenge misinformation and inaccuracies.

4. Immediate implementation of EU GMO regulations: The EU regulatory framework on the use of GMOs from farm to fork should be implemented, properly focussing on science. Furthermore, timelines prescribed in the regulations should be respected, particularly at national level. Its regulatory predictability should also be much improved both at national and EU-levels. In addition, ‘pragmatic’ thresholds for the adventitious presence of GM seeds in lots of non-GM seeds should be established as soon as possible.

Participants agreed this is a priority, as it constitutes a major barrier to competitiveness of the agribusiness sector in the EU. However, it is difficult to see how to make collectively the regulations work. The main problem is that politicians in several EU Member States do not seem to have anything to gain by approving GM products, while industry is unable to deliver products, which are desirable from a consumer point of view. There is no incentive for member states to comply with regulations. Consumers are unaware of the good work done against pests or work on plant-derived replacements for omega 3 fish oils using a GM plant route or blue carnations.

There was concern among participants as to whether companies could make enough profit to develop products for the European market – many EU food companies are SMEs and there is a perception that food is cheap. However, there would be significant demand for biorenewables in the longer term (30-50 years) such that a long term strategy is needed for Europe to bridge this gap.

5. Policy reforms and governance: For the development of a knowledge-based bio-economy, offering multinational enterprises (MNEs) in agricultural biotechnology, small and medium-sized enterprises (SMEs) in the seed industry and public institutions attractive opportunities for investment and collaboration, reform proposals for the current Common Agricultural Policy (CAP), as well as policies and regulations on energy, chemicals, materials and GMOs should be seriously examined and revised.

Participants agreed with the recommendation in general. However, this should not lead to navel gazing and a re-examination of all policies, but to clear routes forward, enabling the placing on the market of products. It was suggested that a body be established at national level responsible for achieving greater policy coherence; first, to ensure coherent implementation of existing policies, and, second, to develop a long-term vision on a bio-based knowledge-economy. It would also be good to set up an EU-wide forum with representatives from various institutions to discuss this topic in detail.

CONCLUSIONS AND NEXT STEPS

The Chair thanked participants for their contributions and urged them not to lose sight of the tremendous potential of this area. The participants wanted commitment to action and not further debate. The UK has sent a draft of this workshop report to participants and those who were invited, but unable to attend, for comment. It would subsequently draw up an action plan, for all 3 workshops setting out what should happen next with firm recommendations.

Piet Schenkelaars
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