

**Scientific Advisory Board (SAB)**  
**Groupement d'Intérêt Scientifique (GIS)-Biotechnologies Vertes (BV)**  
**Meeting at Paris, 28st-30st September 2016**

The following members of the SAB attended the meeting:

- Pere ARÚS (Institut de Recerca i Tecnologia Agroalimentàries, Barcelona, Spain)
- Ian GRAHAM (University of York, UK)
- Peter WESTHOFF (University of Düsseldorf, Germany), Chair

**1. Global assessment of the state and the progress of the *Biotechnologies vertes* programme during the reporting period (2014-2016)**

The SAB already stated in the 2014 report that the projects assembled in the "*Biotechnologies vertes*" programme have been well chosen and that they address the needs of modern crop science in the present agricultural context. The scientific progress made in the individual projects in the last 2 years (see the supplement "Summary evaluations of the nine projects of the *Biotechnologies vertes* programme") supports our previous conclusions and confirms the quality of the scientific teams engaged to deliver these strategic projects .

**(a) Organization of the *Biotechnologies vertes* programme and the role of GIS BV**

The organization of the programme into individual target crops of strategic relevance to France has been successful. This strategy has incentivised researchers across a broad but complimentary range of expertise to work together in dedicated project teams each focussed on improvement of a single crop. The introduction of thematic committees, by the GIS BV, that address scientific issues and methods/techniques that are common to many projects was instrumental in avoiding the fragmentation of the programme in to nine separate pillars. Clear synergy effects are visible, and the GIS-BV therefore played a key role in developing the *Biotechnologies vertes* programme into ONE cohesive programme. In its last report the board concluded "that the GIS-BV is an essential component of the BV programme". This conclusion is still valid.

**(b) Public-private partnership**

The GIS BV excels in bringing together the major French players in public applied plant research and in private plant breeding and seed production. The public-private partnership was a strategic decision to maximise future impact and is a hallmark of the programme – as it was already in the foregoing Genoplante programme. It is unique from an international perspective, for instance in comparison to applied Plant Research Programmes in Germany or the UK.

**(c) Funding of crop research via the "*Programme Investissements d'Avenir (PIA)*"**

Life cycles of crops are relatively long and the breeding of crops as well as their genetic analysis correspondingly takes time. The board is pleased to note that the eight to nine years of funding provided by the PIA BV programme is beginning to pay off.

#### **(d) Data management**

Modern science is producing "big data" and the scientific exploitation of these data in present and future times requires that the data are deposited in a structured way using a common language and international standards. The board is very pleased to note that GIS BV has taken up this challenge and implemented rigorous data deposition and storage schemes for the entire programme that allow the interoperability of the data repositories. GIS BV is encouraged to proceed on that path.

### **2. Recommendations for the future development of the programme**

#### **(a) Innovation**

The discovery of novelty requires an attempt to pursue the unforeseeable and to leave known and established pathways of knowledge. The board has noted in its last report "that researchers should pay more attention to embarking on more risky projects with a higher degree of innovation potential". Some researchers have taken up this advice, but we again feel that still more emphasis could be put, for instance, on the molecular identification of major QTL and/or the genetic basis of key traits.

#### **(b) Socio-economic analysis of projects**

GIS BV is a programme of applied plant research aiming to strengthen the competitiveness of the French industrial sector in crop breeding and production. The various projects funded in the programme should therefore be carefully evaluated whether their innovation potential is sufficient in the international context.

#### **(c) Impact assessment**

The BV programme is at the halfway point. The programme has already generated new companion/spin-off research projects. This indicates that the PIA1 projects paved the way to additional research grounds and partnerships. It is a good moment to think of ways to demonstrate to Society and particularly to the funding sources that the outcome of PIA1 projects is beginning to justify the investment. This has to be done considering two major distinctive elements of these projects: their unusual long term and their public-private nature. Success stories and indices that show in a clear and simple way the value and synergistic effect of each of these distinctive features should be identified and used to message and market the programme.

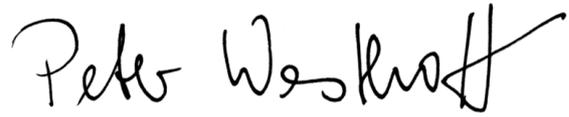
### **3. Concluding remarks**

The BV programme is unique in its strategic design by combining state of the art crop genome research with plant phenotyping and by integrating these two approaches with commercial plant breeding. The programme is strategically well conceived and, not surprisingly, France is therefore leading in genome-based applied crop research in Europe. The board encourages therefore the French authorities to pursue this impressive path also in the future and include strategically positioned plant research into the third wave of the *Programme Investissements d'Avenir*.

The GIS BV created the opportunity for open, large discussions in order to develop ideas and concepts for a successor programme during the seminar at Paris, and is thus an essential component in shaping the future of the *Biotechnologies vertes* of France. We recommend that a future BV programme puts special emphasis on risky projects with a strong innovation potential. These projects should combine both basic and applied plant research and would greatly strengthen the competitiveness of the French breeding/agroindustry sector.

Research on crops is an international endeavour and the board recommends that follow-up programmes should involve discussion at the European level or at bi-/tri-national levels in order to create synergies and avoid duplication of efforts.

Düsseldorf, October 22, 2016

A handwritten signature in black ink, reading "Peter Westhoff". The signature is written in a cursive style with a long, sweeping horizontal stroke at the end.

Prof. Dr. Peter Westhoff