



**TRANSCONTAINER EUROPEAN STAKEHOLDER WORKSHOP**

**BRUSSELS, 15 OCTOBER 2009**

**WORKSHOP REPORT**

**Schenkelaars Biotechnology Consultancy  
Costerweg 5, NL-6702 AA Wageningen, the Netherlands**

**With support from the European Commission under the Sixth Framework Research Programme (2002 – 2006)**

## CONTENT

---

<b>1.</b>	<b>INTRODUCTION</b>	<b>page</b>	<b>3</b>
1.1	The objectives of Transcontainer		3
1.2	The means and objectives of the European stakeholder workshop		3
1.3	About this report		4
<b>2.</b>	<b>THE INTRODUCTORY SESSION</b>		<b>5</b>
2.1	Transcontainer and European Commission supported research		5
2.2	Scientific progress on biologically contained GM plants and trees		5
2.3	Risk assessment and potential contribution to coexistence		6
2.4	Socio-economic benefits of biological contained GM crops and trees		6
2.5	Findings from interviews with European stakeholders		7
<b>3.</b>	<b>THE FILM PORTRAITS – SIX STAKEHOLDERS PERSPECTIVES</b>		<b>9</b>
3.1	Introduction by the film maker		9
3.2	The GM farmer		9
3.3	The organic farmer		10
3.4	The co-existence policy advisor		11
3.5	The industry lobbyist		12
3.6	The scientist		13
3.7	The anti-GM activist		14
<b>4.</b>	<b>THE CLOSING SESSION</b>		<b>15</b>
4.1	Consumers and biologically contained GM crops		15
4.2	Follow-up		15
<b>5.</b>	<b>LIST OF PARTICIPANTS</b>		<b>16</b>
<b>6.</b>	<b>EUROPEAN STAKEHOLDER WORKSHOP PROGRAMME</b>		<b>18</b>

## **1. INTRODUCTION**

---

### **1.1 The objectives of Transcontainer**

Transcontainer is a European Commission funded research project in the 6<sup>th</sup> Framework Programme with the following objectives:

- To promote coexistence of GM and non-GM crops in European agriculture by using biologically containment strategies in GM crops by improving and simplifying rules for coexistence.
- To develop biologically contained GM crops that are environmentally safe and commercially viable; a series of different strategies are implemented and tested with a view to biological containment of transgene flow from GM plants and trees, varying from chloroplast transformation to several (combined) techniques that aim at controllable fertility or controllable flowering.
- To assess environmental, human health and socio-economic impacts of the use of biologically contained GM crops in European agriculture.
- To enhance understanding and acceptance of coexistence through biologically contained GM crops by invoking dialogue with and between stakeholders and the general public.

### **1.2 The means and objectives of the European stakeholder workshop**

In May 2006 Transcontainer partners began their work and finalised it by October 2009. To present and discuss their achievements and findings with different European stakeholders, a one-day European stakeholder workshop was organised in Hotel Bloom, Brussels, Belgium on 15<sup>th</sup> of October 2009.

This stakeholder workshop was preceded by a scientific workshop the day before. At this workshop Transcontainer partners had presented and discussed their results with various scientists from several research institutions and biotechnology and seed companies. Many other stakeholders, like national coexistence policy makers and advisors, representatives from the European Commission and critical groups, had also participated at this scientific workshop. Moreover, all participants had been sent a background document with an overview of Transcontainer's results and findings.

To facilitate and focus the exchange of views at the stakeholder workshop, a particular structure had been chosen:

1. At the introductory session, Transcontainer partners presented their results from their research on: 1) biological containment strategies for GM plants; 2) risk assessment and contribution to co-existence of GM and non-GM crops, and; 3) socio-economic effects of biologically contained GM crops. The session was closed by a summary of the findings from interviews held with representatives of about forty different European stakeholder organisations from November 2007 to August 2009.
2. Each next session was subsequently started by the presentation of a film portrait of about eight to ten minutes. These film portraits had been produced by an independent

film maker in commission of Transcontainer and each had to show a particular stakeholder perspective. In total six film portraits were presented: 1) the GM farmer; 2) the organic farmer; 3) the co-existence policy advisor; 4) the scientist; 5) the industry lobbyist, and; 6) the anti-GM activist. After each film portrait an invited speaker, representing a stakeholder, was given the floor to comment on issues that had emerged from the film portrait. Thereafter, all participants were invited to forward their questions and views.

3. The closing session was started with a presentation on consumer behaviour and decision-making with a view to Transcontainer's biologically contained GM crops and followed by a final debate among the participants.

Moreover, during the day, the film maker shot footage for the seventh film portrait: an impression of the stakeholder workshop, including interviews with some of the participants. This film portrait and the other six have later been wider disseminated through DVD and the Internet.

### **1.3 About this report**

This report consists of a concise summary of the introductory session, the session with film portraits and the closing session, the list of participants and the workshop programme. The full presentations given by Transcontainer partners and invited speakers have been included in two separate annexes.

## **2. THE INTRODUCTORY SESSION**

---

**Chair: Kim Boutilier, Plant Research International Wageningen University Research**

### **2.1 Transcontainer and European Commission supported research**

Ciaran Mangan from the European Commission Directorate-General Research introduced the Transcontainer project in relation to two other research projects supported by the European Commission under the Sixth Framework Programme (2002 – 2006). With a view to endorse research to support freedom of choice for consumers and farmers between GM, conventional and organic foods and crops, two other major research initiatives were presented: SIGMEA and CO-EXTRA.

The three research projects together led to the following results: 1) experimental information on gene flow, containment and on environmental impacts of Bt-maize, oilseed rape, etc.; 2) model farming practices that minimise gene flow and adventitious mixing of GM and non-GM crops; 3) socio-economic impact studies for growing GM crops; 4) inputs to current regulatory regimes of the EU and member states and their implementation, as well as defining the role of insurance companies and liability; 5) practical recommendations for the decision-making processes relating to the market release of GM crops about gene flow and its implications in terms of coexistence; 6) ways to fill gaps in gene flow knowledge with respect to presence and impact; 7) a landscape generator simulating agricultural landscapes and gene flow modelling platforms; 8) decision-support systems for regional farming; 9) monitoring tools and strategies for on-site GMO detection, identification and quantification, as well as sampling procedures for maize, oilseed rape and sugar beet; 10) scenarios ensuring coexistence in six regional case studies, and; 11) transgene containment systems.

Given the importance to further support European Commission and national coexistence policy making and implementation, the participants were then invited to have a fruitful exchange of views and come up with suggestions for further research that could support coexistence in European agriculture.

### **2.2 Scientific progress on biologically contained GM plants and trees**

In his presentation Transcontainer's project leader Ruud de Maagd from Plant Research International University Wageningen University Research started by describing three different biological containment strategies that had been advanced by Transcontainer: 1) controllable fertility; 2) controllable flowering, and; 3) chloroplast transformation. He explained that target points and approaches used for biological containment systems for GM plants and trees depend on their end-use, reproductive characteristics and breeding requirements. In essence, each of the approaches or combinations thereof aims at controlling and minimising the spread of transgenes from a GM crop or tree to non-GM relatives.

Controllable fertility had been targeted for crops that are harvested for seed and/or fruits, like oil seed rape, tomato, egg plant and grasses, controllable flowering at crops harvested for their vegetative parts, like sugar beet, grasses, poplar and birch, and chloroplast transformation at sugar beet and oilseed rape. Transcontainer had achieved chloroplast transformation in sugar beet but not yet in oilseed rape. Floral repression had been achieved in sugar beet, tall fescue,

rye grass, poplar and birch with varying levels of success, while floral restoration had been achieved in arabidopsis but not yet in tall fescue and sugar beet. Since technical developments in controllable flowering are still at an early stage, it was too early to draw firm conclusions about their suitability for application under field conditions. The same was true for technical developments in controllable fertility.

### **2.3 Risk assessment and potential contribution to coexistence**

Detlef Bartsch from the Federal Office of Consumer Protection and Food Safety, Germany, presented the results of a 'theoretical' environmental risk assessment of biologically contained GM crops; none of the biologically contained GM crops or trees had been tested in the field, only in the laboratory or greenhouse. The environmental risk assessment had been performed in conformity with the principles of the environmental and health assessment as published by the European Food Safety Authority.

Concerning environmental impact assessment, the most promising containment technologies are chloroplast transformation and male sterility by metabolic starvation. The other four technologies - male sterility by expression of a toxic protein (Barnase), flowering repression by over-expression of endogenous flower-mediating genes, flowering repression by RNAi mediated gene regulation, seed sterility by a miRNA mediated gene regulation - were still in too early stages of development.

Furthermore, the benefit of any containment strategy depends on the containment goal: 1) coexistence support separation between GM and non-GM crop cultivation, where the benefits are primarily economic since the GM crop plant will have passed a safety approval. The benefits will already start at low containment levels and will in particular provide access to transgenic traits for small farmers facing compliance problems with distance requirements, and; 2) biosafety standards support high level separation, e.g. in case of GM plants for non food/non feed use, like pharmaceutical plants. However, as no biological containment system is likely to be 100 % tight, a combination of more than one Transcontainer strategy is recommended.

Moreover, depending on the intended harvest product as well as the pollination strategy (e.g. wind- or insect-mediated), several Transcontainer strategies are suitable for containment. It was noted that flower repression potentially offers the highest level of containment, but it might be difficult to manage re-induction of flowering (e.g. with ethanol) if seed production is obligatory at a later stage of breeding programs or seeds are the harvest final product. In the case of oil seed rape, sugar beet, egg plant and tomato the main economic benefits are reduced separation distances and resulting compliance costs. For grasses and poplar, access to the genetically modified trait as such is the major advantage. In general, the combination of single Transcontainer containment strategies should be considered for all crops regarding environmental benefits.

### **2.4 Socio-economic benefits of biological contained GM crops and trees**

Justus Wesseler from the Environmental Economics and Natural Resources Group Wageningen University Research started by introducing the approach to assess the socio-economic benefits of biologically contained GM crops. The aim was to identify possible

incremental benefits and costs of GM crops, possible effects of coexistence regulations on adoption and effects of biological containment on coexistence and adoption.

Overall, the assessment led to the conclusion that biological containment can reduce coexistence compliance costs and reduce discrimination of coexistence policies against small farmers. From an economic point of view, some crop-specific results were that the Transcontainer's approaches to biological containment are relevant for coexistence of GM and non-GM oilseed rape, limited in the case of grasses and negligible for sugar beet, tomato, egg plant and poplar.

The socio-economic assessment further suggested that planting of herbicide-tolerant GM oilseed rape in the EU in 2007 would have led to a net benefit ranging from 202 million € to 651 million € or 57 € per hectare to 151 € per hectare. In the case of not adopting GM poplar, annual loss for European society was estimated between 211 million € to 3.5 billion €.

It was also noted that the potential benefits of biological containment for research, seed production and pharmaceutical crops had not been considered in the assessment but they might be larger. Effects on farmer saved seeds in European agriculture of biological containment had neither been assessed, as these were considered less relevant in a market economy.

## **2.5 Findings from interviews with European stakeholders**

Piet Schenkelaars from Schenkelaars Biotechnology Consultancy, the Netherlands, first explained the way Transcontainer had tried to communicate with different stakeholders, aiming at informing them about the research as well as learning their views. From November 2007 to August 2009 telephone interviews had been held with national coexistence policy makers and advisors and representatives of European stakeholder organisations. These stakeholders included agro-chain operators and public interest groups, such as the European Seed Association, Europabio, Monsanto, Bayer, Syngenta, Cargill, European Foods and Drinks Association (CIAA), Copa-Cogeca, Euro Coop, EuroCommerce, Royal Ahold, European Consumers Association (BEUC), Soil Association / International Federation of Organic Agriculture Movements (IFOAM), EcoNexus and Friends of the Earth Europe. It was noted that other public interest organisations, like Greenpeace, the European Environmental Bureau and World Wildlife Fund did not wish to co-operate.

During these interviews the following issues had been addressed: 1) national coexistence policy developments; 2) biologically contained GM crops and coexistence; 3) biologically contained GM crops and hybrid breeding; 4) public acceptance of biologically contained GM crops, and; 5) European Commission support to Transcontainer. These interviews had resulted in two reports, which both had been made publicly accessible at the Transcontainer website, led to the following findings:

Views on coexistence: Almost all interviewees endorsed the principle of coexistence, except environmental and critical groups. Organic farmers had mixed views and expressed concern about the adventitious presence GM-labelling threshold of 0.9 % instead of 0.1 %. Biotechnology and seed industries considered coexistence measures in some European countries disproportionate and discriminatory against GM crops. Many interviewees regarded liability redress in case of GM impurities as a very contentious issue.

Views on biologically contained GM crops and coexistence: Most national coexistence policy makers and advisors and conventional and organic farmers and consumer organisations considered biological containment a good idea, provided it is safe and reliable. Some national coexistence policy makers and advisors did not see a need for biological containment, as they considered their national coexistence policy measures feasible and workable. Biotechnology and seed industries did neither see a need, also because farmers already have substantial experience with segregation for crops with added value, like for example so-called ‘waxy maize’. Other agro-food chain operators did not have strong views, whereas environmental and critical groups found biological containment not useful. In their view, biologically contained GM crops are a false solution, also because there are many non-GM solutions for sustainable agriculture.

Views on biologically contained GM crops for hybrid breeding: Biotechnology and seed industries had mixed feelings, as it would financially only make sense in case of high-value traits or seeds. Environmental and critical groups favoured open-pollinated crop varieties rather than hybrid crop varieties, because they would be more beneficial for farmers and better adapted to local circumstances and enable farmers to save their own seed.

Views on public acceptance of biologically contained GM crops: Hardly any interviewee expected that biologically contained GM crops would improve public acceptance of GM crops, as they are even more GM. Several interviewees warned that biologically contained GM crops might raise the impression that ‘outcrossing’ is indeed not environmentally safe; though, coexistence is an economic issue. Most interviewees expected that environmental and critical groups would frame biological containment as “Terminator Technology”. And that was indeed the case. Environmental and critical groups did frame biological containment as “Terminator Technology”.

Views on European Commission support to Transcontainer: Many national coexistence policy makers and advisors endorsed the European Commission support to Transcontainer as any strategy that would facilitate coexistence in Europe. Yet, a few argued that coexistence measures in their country are already feasible and workable. Biotechnology and seed industries felt that research on biological containment systems might be worthwhile for increasing basic scientific knowledge and for GM crops producing industrial and pharmaceutical compounds. Other agro-food chain operators and consumer organisations did not have outspoken views. Some argued that any research that could help European farmers to grow GM crops was welcome. By contrast, organic farmers and environmental organisations and critical groups felt that public money had been spent on a problem caused by biotechnology firms.

### **3. THE FILM PORTRAITS – SIX STAKEHOLDERS PERSPECTIVES**

---

**Chair: Piet Schenkelaars, Schenkelaars Biotechnology Consultancy**

#### **3.1 Introduction by the film maker**

Barend Hazeleger from Agrapen, an independent film maker, explained that Transcontainer had hired him to capture the perspectives from six different stakeholders in film portraits of about eight to ten minutes each. The selection of persons to be portrayed was based on the idea of “those who’ll know about containment”, like farmers, plant breeders, scientists, policy makers, industry lobbyists and anti-GM campaigners. Eventually, suitable persons were identified and selected through an Internet search and through personal contacts of Transcontainer partners. At the end of this introduction it was noted that making a film is not the same as doing science. A film maker is more interested in particularities rather than generalities and transfer of additional information through representing a broad array of opinions rather than a specific scientific viewpoint.

#### **3.2 The GM farmer**

##### **3.2.1 The portrait**

Jörg Piprek grows GM Bt-maize at a rather large scale. With a view to control infestation of his crop by the European Corn Borer (ECB), he prefers this insect-resistant GM maize over mechanical, biological and chemical control. Cooperation with neighbouring non-GM maize farmers is essential to implement measures for co-existence between GM and non-GM maize. To his opinion, biologically containment (bc) strategies are not necessary to achieve co-existence. He further argues that bc will not persuade opponents of GM crop because of their Terminator-like nature. Finally, he objects against certain inconsistent regulations for growing GM Bt-maize nearby a nature reserve compared to those for a conventional crop that involves chemical spraying.

##### **3.2.2 Maria de Fátima Quédas, Escola Superior Agrária de Santarém, Portugal**

In her presentation Maria de Fátima Quédas pointed out that Jörg Piprek who grows GM maize on 360 hectares, within a 600 hectares farm, can rather easily keep GM maize and conventional cultivars of different neighbours well apart. Nonetheless, cooperation between neighbours is still important. This situation is completely different from what happens in small scale agriculture, like in Portugal. Cooperation between neighbours for achieving coexistence is here imperative. It was stressed that in the EU 71 % of the holdings are of 5 hectares or less and therefore many maize growers risk facing problems with coexistence, particularly if the commercial pressure against GM feeds succeeds. In theory, for a naturally out-crossing seed crop that easily disperses pollen but scarcely disperses seed, like maize, chloroplast transformation would a good biological containment strategy and would greatly simplify coexistence in small scale maize farming. In the case of oilseed rape and some fodders grasses, which are out-breeders that disperse both pollen and seed, coexistence would require the combination of more than one single biological containment strategy. However, for autogamous species that hardly disperse seed, such as tomato or egg plant, biological containment is hardly relevant for coexistence. In such crops, the most relevant use of

biological containment would be for hybrid breeding. GM pure lines or hybrids of these crops would not need significant isolation measures to coexist with non-GM varieties.

Subsequently the question was raised how regulations could discriminate between the potential use of biological containment strategies for coexistence and hybrid breeding. Another question was whether biological containment strategies would ever reach the market, as biotechnology industry had indicated that they were not necessary for achieving coexistence.

Finally, the issue was addressed that GM farmers have the burden to implement coexistence rules, also when they use less chemical pesticides than conventional farmers. In Portugal, the coexistence rules split the burden: the GM farmers must keep the isolation procedures to the neighbours outside the production zone and pay for the compensation fund, whereas their non-GM neighbours inside the production zone will provide the refuge areas and have their production labelled as GM, also because there is no premium for non-GM maize. In this context, biological containment strategies could make it easier for all farmers, but are also a big challenge to regulators in particular.

### **3.3 The organic farmer**

#### **3.3.1 The portrait**

Almost thirty years ago Digni van den Dries decided for organic farming. Conventional farming had then led to an impoverished nature and a chemically polluted environment, and farmers suffered from a bad image as polluters. He argues that introduction of GM crops could result in GM-impurities in his produce, due to outcrossing from GM crops in the neighbourhood of his farm or from GM-impurities in seed lots. As a consequence, he might lose the price premium for organic produce as well as his production license from SKAL, the certification body for organic produce. In his view, biological containment for GM crops might be a solution for co-existence. To a certain extent, he is impressed by the scientific research in this area, on the other hand, he feels that GM agriculture in general is short-sighted and in conflict with his starting point for sustainable agriculture, i.e. a healthy crop grows from a healthy seed in a healthy soil.

#### **3.3.2 Hope Shand, The ETC Group, USA/Canada**

Hope Shand was struck by the similarities between the portraits of the organic farmer and the GM farmer, as both reached the conclusion that biological containment was probably not the solution to the bigger problems of public resistance to GM crops, or the bigger question of what kind of agriculture society should support.

It was then noted that the ETC Group had been critical of Transcontainer from the beginning, also because of the United Nations Convention of Biological Diversity moratorium of 2000 on field testing and commercialisation of Genetic Use Restrictions Technologies (GURTs), including Terminator. This technology was developed by the multinational seed industry and the US government to prevent farmers from re-planting harvested seed in order to maximise seed industry profits. Genetic seed sterilisation is the Holy Grail for the multinational seed industry and it started arguing that GURTS are needed because it offers a tool for containing unwanted gene flow from GM crops. It lobbied aggressively to undo the United Nation's

moratorium at the conference in 2006. Nonetheless, the governments meeting at this conference recommended that the international moratorium on GURTs be upheld and strengthened. Also the European Parliament has sent a resolution in March 2006, urging member states at the Convention of Biological Diversity to reject any proposals to undermine the moratorium.

Against this background, the ETC Group was astonished that a few months later the European Commission supported the Transcontainer research programme that included one project focusing on reversible transgenic sterility. Although the Transcontainer website insisted that this technology only partially resembles Terminator because it would include a mechanism that allows farmers to restore the fertility of the crop, this so-called Recoverable Block of Functions linked to seed lethality should be considered a V-GURT.

It was further noted that Transcontainer researchers had applied for patents on reversible transgenic sterility at the World Intellectual Property Organisation (WIPO) and the Italian patent office. If the patents are granted, it supposedly means that there has been a new innovation in reversible transgenic sterility. Research financed by the European Commission would thus have advanced Terminator technology. Subsequently, the issue was raised what will happen when commercial firms want to license the patent. It was assumed that Transcontainer will have no say how its research will be used in the future.

Genetic switches to turn fertility on and off will be promoted as an environmental security measure, but, if regulators can be convinced that it is a viable technology, it will ultimately be used by the seed industry to control the reproductive viability of crops and oblige farmers to pay for the privilege of restoring seed fertility every year. The question was therefore raised why public scientists are using scarce public money to advance this goal when there are so many other pressing needs? In the view of the ETC Group, the European Commission should discontinue all funding for this research and formally request that any patent applications on V-GURT technology resulting from Transcontainer research be withdrawn and abandoned.

### **3.4 The co-existence policy advisor**

#### **3.4.1 The portrait**

Maria de Fátima Quédas introduces the Portuguese coexistence regulations. To her opinion, these regulations ensure freedom of choice between different types of agriculture. Yet, in regions where small-scale agriculture prevails, like in the centre of Portugal, it may be difficult to comply with all coexistence rules. She visits a group of farmers in this region, where they have agreed to establish so-called production zones for growing Bt-maize. The farmers explain the benefits of participating in such production zones. While the Portuguese law gives all farmers the tools to choose between GM and non-GM, the duties for co-existence are laid down by the GM growers, according to one of the farmers, while they also have to finance an unclear compensation fund that has been set up to ease public concern. A farmer further complains the loss of governmental subsidies for practicing integrated cultivation, when he opts to grow GM Bt-maize. He does not understand why the Portuguese coexistence regulations place the burden of the GM maize grower, while at the same time GM maize for feed is imported into the country without many problems. In his view, biological containment is not that important for farmers to achieve co-existence, but it could be important to address consumer worries. In addition, there is a risk that biological containment

will mainly be used to protect seed industry's interests, which might well provoke further public debate on GURTs.

### **3.4.2 Daniel Perez, Copa-Cogeca, Belgium**

In his presentation Daniel Perez gave an overview of the experiences of Spanish farmers who have been growing GM Bt-maize on thousands of hectares since twelve years. The benefits for farmers have been higher yields and improvement of harvesting due to reduced stalk lodging. For citizens and consumers the benefits have been reduced use of pesticides, enhancement of conservation tillage and healthier grains due to much less infection by mycotoxins.

It was then pointed out that historically farmers have been and still are neighbours in the same community, requiring all sorts of agreements, like for instance in the case of water management where channels have been used jointly since the Middle Age. With a view to coexistence, there are many studies that support workable isolation distances or flowering date management arrangements, while Spanish Bt-maize farmers have shown in practice that they are able to make agreements with their non-GM maize neighbours. So far, there have been no legal cases due 'contamination' after twelve years of commercial Bt-maize growing in Spain.

It was finally stressed that coexistence should not be a barrier to competitiveness and rural development. Coexistence measures and biological containment technologies must therefore be proportionate and based on real data rather than on fear and opinions.

## **3.5 The industry lobbyist**

### **3.5.1 The portrait**

Garlich von Essen from the European Seed Association (ESA) and Willy de Greef from Europabio are interviewed by Piet Schenkelaars from the Transcontainer project. They start discussing whether biological containment would facilitate coexistence and make it less costly in the European situation. According to both industry spokespersons, there is no real need, as farmers have considerable experience with segregation measures for a variety of crops. Subsequently, they explore the conditions for biotechnology and seed companies to actually deploy biological containment strategies. Both industry spokes persons then explain that their deployment would also require regulatory approval; a process that is quite cumbersome in Europe at the moment. On the other hand, they might enable the use of GM crops with industrial or pharmaceutical compounds in a bio-based economy. As such, Transcontainer might contribute to lift current moratorium on the release of GM crops with Terminator-like technologies.

### **3.5.2 Ivo Brants, Monsanto Europe, Belgium**

Ivo Brants started by pointing out that coexistence aims at ensuring freedom of choice to produce or to use products derived from conventional, organic or biotech based cropping systems. It was further explained that Terminator technology had been voluntarily discontinued from commercialisation in 1999 because of negative perception created with the

public and not because of scientific or agronomic reasons. Moreover, male sterility was not considered a containment tool but a tool to produce efficiently seed at high purity levels.

Potential advantages of biological containment included: 1) Return on investment for the technology provider; 2) Protection of Intellectual Property Rights; 3) Product stewardship (coexistence, volunteer management, provides access only in intended agricultural settings and reduction of compliance costs), and; 4) Increase adoption possibilities for small scale farmers.

Potential disadvantages were: 1) Perceived as promoting 'seed sterility' rather than 'farm management'; 2) Farmer saved seed not possible (in less developed agricultural regions); 3) No perceived direct benefit for consumers, and; 4) Regulatory approvals because of more complex technology.

Finally, it was noted that biological containment is not needed to achieve coexistence in maize, because current tools (isolation distances, border rows, nicking, farmer communication) are sufficient to achieve 0.9 % labelling thresholds allowing freedom of choice. On the other hand, biological containment might potentially be applied to food crops that are grown for non-food uses, for example in the case of some biopharmaceuticals.

## **3.6 The scientist**

### **3.6.1 The portrait**

Richard Jefferson asks how to take biological containment further and deliver it to the public. He notes that Transcontainer uses existing technologies that are patented. Since most of these patents are controlled by a few powerful players, he expects that the research by Transcontainer will therefore only lead to modest public returns, which also depend on the patents involved and obtained. He argues that current complex patent landscapes in agricultural biotechnology make democratization of innovation difficult. He therefore argues for open innovation as well as to rethink public research for creating wealth. He expects that open innovation will lead to many Small and Medium sized Enterprises (SMEs) that will do things in agricultural biotechnology that large biotech firms would not do. According to him, biological containment should not be developed by public sector researchers; Transcontainer is an engineering project, for which private sector researchers are better equipped. Moreover, biological containment will not nullify public concerns about GM crops, even if biological containment would be 100 % effective.

### **3.6.2 Joachim Schiemann, Julius Kühn Institute, Germany**

In his presentation Joachim Schiemann began by a short explanation of SIGMEA, Co-Extra and Transcontainer: three European Commission supported research projects that aimed at advancing scientific knowledge and developing feasible and cost-effective methods for the implementation of EU and national rules on coexistence of GM, conventional and organic crops and regulations on labelling and traceability of GMOs. As such, all research efforts had been geared at enabling freedom of choice for farmers and consumers. He agreed with Richard Jefferson that for certain crops chloroplast transformation could be a very useful biological containment tool. On the other hand, biological containment did not always need to be based on genetic modification. Biological containment could also be achieved through conventional breeding focused on traits like for instance conventional male sterility (CMS) or

cleistogamy as one of the presentations had shown on the scientific workshop the day before. Moreover, advancement of scientific knowledge on the reliability of biological containment tools and the practicability of different combinations could also be very relevant, not only for farmers seeking coexistence but also with a view to the potential use of (food) crops for safe production of (bio)pharmaceuticals. Though, it was also noted that not in all cases of pharmaceuticals there would be a need for biological containment, like for instance in the case of HIV-antibodies.

### **3.7 The anti-GM activist**

#### **3.7.1 The portrait**

At the GMO-free zones conference Benedikt Härlin notes that negotiations between countries within the Convention on Biological Diversity have led to a moratorium on GURTs and Terminator technologies, because of their potential impacts on biodiversity. He therefore criticises the support of the European Commission to the Transcontainer research project. It is further argued that co-existence of GM and non-GM agriculture is impossible in Europe. The concept of co-existence would have been conceived by the biotechnology industry to legitimise sneaky GM contamination of agriculture. But this concept has led to the opposite, as it has further contributed to a fundamental rejection of GM crops in Europe. In his view, the concept of biological containment is philosophically insane but very logical from a point of view that aims at fully controlling seed as a production factor in agriculture. He then argues that biological containment is a frightening concept of the human species controlling and directing the evolution of plant species. In his view, plant breeding should instead make better use of evolution as a force. He ends by arguing that the public research money spent on GM agriculture, including Transcontainer, should have been spent on organic agriculture, species preservation and public agricultural research.

#### **3.7.2 Digni van den Dries, organic farmer, the Netherlands**

Almost thirty years ago Digni van den Dries decided to switch to organic farming, because conventional farming had devastating impacts on the environment, led to low incomes for farmers, suffered a bad public image and was unfair to the majority of the farmers in the world.

Although biological containment technologies could be a good solution to prevent GM contamination of non-GM crops, there are still technical doubts about the reliability of several of these biological containment technologies and their public acceptability. In his view, the most important issues related to GMOs and sustainable production are: 1) For what problems do we need GMOs?; 2) Do GMOs serve any common public goals?, and; 3) How to avoid too much influence of multinationals and/or states on food production?

Since, in his view, GMOs can hardly play a positive role in sustainable agriculture, most discussions on GMOs divert attention from what really needs to be done. And that is to address poor soil management, poor water management, poor crop rotation and poor prevention of diseases. These problems are all a result of poor levels of investment in agriculture, bad agricultural and trade policies in many countries, inadequately focused agricultural research and inadequate dissemination of sane agricultural knowledge.

## **4. THE CLOSING SESSION**

---

**Chair: Piet Schenkelaars, Schenkelaars Biotechnology Consultancy**

### **4.1 Consumers and biologically contained GM crops**

The closing sessions was started by Michael Siegrist from the Swiss Federal Institute of Technology Zürich, who described two different psychological mechanisms people use for decision-making under a wide variety of circumstances: 1) the experiential system that works holistically, is based on affection, encodes reality in concrete images, metaphors and narratives and is oriented toward immediate action, and; 2) the analytical system that works analytically, is based on logic, encodes reality in abstract symbols, words and numbers and is oriented toward delayed action. Overall, the experiential system is self-evidently valid: “Experiencing is believing”, whereas the analytical system requires justification via logic and evidence. Given that most consumers use the experiential system for decision-making, it was explained that the trust in institutions (industry) is crucial for determining consumers perceptions of benefits and risks of GM products and their acceptance. However, Transcontainer technologies do not have an impact on benefits, while at the same time risk reduction is not 100 % and needs to be communicated. Gaining trust will therefore be important.

### **4.2 Follow-up**

After a short discussion between the participants on the communication problems of Transcontainer, the chair thanked everybody for contributing to the workshop. The divergence of views on Transcontainer had not been bridged. Nonetheless, he hoped that participants at least had picked up something from the workshop and promised all participants a DVD with the film portraits and the workshop report in due time.

## 5. LIST OF PARTICIPANTS

Alexandra Hüsken	Julius Kühn Institute, Federal Research Centre for Cultivated Plants Institute for Biosafety of GM Plants, Germany
Alice Stengel	European Commission, Belgium
Alisher Touarev	University of Vienna, Austria
Angel Martin	COPA-COGECA, Belgium
Angela Spagnoletti	Ministry for the Environment and Land Protection, Italy
Anne-Katrin Bock	European Commission, Belgium
Barend Hazeleger	Agrapen, The Netherlands
Carla Struzyna-Schulze	Czech University of Agriculture in Prague, Department of Agroecology and Biometeorology, Czech Republic
Christiane Koziolok	Bioeconomy Research and Technology Council, Germany
Christian Sig. Jensen	DLF Trifolium, Denmark
Christof Potthof	Gen-ethisches Netzwerk, Germany
Ciaran Mangan	European Commission, Belgium
Cindy Boonen	Vlaamse Overheid, Departement Landbouw en Visserij, Afdeling Landbouw- en Visserijbeleid, Belgium
Daniel Pearsall	Supply Chain Initiative on Modified Agricultural Crops (SCIMAC), United Kingdom
Daniel Perez	COPA-COGECA, Belgium
Danny Hooftman	Centre for Ecology and Hydrology, United Kingdom
Detlef Bartsch	Federal Office of Consumer Protection and Food Safety, Germany
Didier Breyer	Scientific Institute of Public Health, Division of Biosafety and Biotechnology, Belgium
Digni van den Dries	Organic farmer, the Netherlands
Dirk Dobbelaere	Division of Molecular Pathobiology, University of Bern, Switzerland
Eveline Lecoq	Dupont, Belgium
Guiseppe Rotino	CRA-Research Institute for Vegetable Crops, Italy
Hope Shand	ETC Group, United States
Irma Salovuori	Ministry of Social Affairs and Health, Board for Gene Technology, Finland
Ivan Minkov	University of Plovdiv, Bulgaria
Ivo Brants	Monsanto, Belgium
Jaap Satter	Ministry of Agriculture, Nature and Food Quality, The Netherlands
Jeremy Sweet	The Green, United Kingdom
Joachim Schiemann	Julius Kühn Institute, Federal Research Centre for Cultivated Plants Institute for Biosafety of GM Plants, Germany
Josef Soukop	Czech University of Agriculture in Prague, Department of Agroecology and Biometeorology, Czech Republic
Justus Wesseler	Wageningen University, The Netherlands
Kim Boutilier	Plant Research International, Wageningen University, The Netherlands
Lauro Topino	CRA-Research Institute for Vegetable Crops, Italy
Macy Merriman	Dupont, Belgium
Magnus Hertzberg	SweTrees, Sweden
Maria Fátima de Quedas	Escola Superior Agrária de Santarém, Portugal
Martin Kater	University of Milan, Italy
Matias Lindner	University of Milan, Italy
Michael Siegrist	Institute for Environmental Decisions, Consumer Behavior Switzerland
Michele Bellucci	National Research Council, Italy
Milena Kostova	University of Plovdiv, Bulgaria

Mike Wilkinson	Institute of Biological, Environmental and Rural Sciences, United Kingdom
Ove Nilson	Umeå Plant Science Centre, Sweden
Ricarda Steinbrecher	Econexus, United Kingdom
Ruud de Maagd	Plant Research International, Wageningen University, The Netherlands
Phil Dix	National University of Ireland Maynooth, Ireland
Piet Schenkelaars	Schenkelaars Biotechnology Consultancy, The Netherlands
Peter Medgyesy	National University of Ireland Maynooth, Ireland
Sabine Gruber	Universität Hohenheim, Institut für Pflanzenbau und Grünland, Germany
Sergio Arconi	Istituto Genetica Vegetale Perugia, Italy
Sigrid Weiland	European Commission, Belgium
Stuart Smyth	University of Saskatchewan, Canada
Niall Gerlitz	European Commission, Belgium
Ricarda Steinbrecher	Econexus, United Kingdom
Valentina Toneva	University of Plovdiv, Bulgaria
Volker Beckmann	Humboldt Universität, Germany
Yann Devos	European Food Safety Authority, Italy

## 6. EUROPEAN STAKEHOLDER WORKSHOP PROGRAMME

09.00	<b>Welcome</b> Piet Schenkelaars
<b>Overview TransContainer Results</b> Chair: Kim Boutilier	
15 min + 5	<b>The Transcontainer project</b> Ciaran Mangan, European Commission DG Research
15 min + 5	<b>Biological containment strategies</b> Ruud de Maagd, Plant Research International (TransContainer partner)
15 min + 5	<b>Biosafety &amp; contribution to co-existence of GM and non-GM crops</b> Detlef Bartsch, Federal Office of Consumer Protection and Food Safety (TransContainer partner)
15 min + 5	<b>Socio-economic effects of biologically contained GM crops</b> Justus Wesseler, Wageningen University (TransContainer partner)
10 min + 5	<b>Stakeholders views on TransContainer</b> Piet Schenkelaars, Schenkelaars Biotech Consultancy (TransContainer partner)
10:35 – 11:00	<b>Break</b>
<b>11.00 – 12.35 Portraits and Discussion</b> Chair: Piet Schenkelaars	
5 min	<b>Introduction to film portraits</b> Barend Hazeleger, Agrapen, the Netherlands
10 min	<b>Portrait GM Farmer</b> - Jörg Piprek; Bt-maize grower, Germany
10 min	Maria de Fátima Quedas, Escola Superior Agrária de Santarém, Portugal
20 min	Discussion
10 min	<b>Portrait Organic Farmer</b> - Digni van den Dries; organic farmer, Netherlands
10 min	Hope Shand, ETC Group, Canada
20 min	Discussion
12:35 – 13:15	<b>Lunch</b>
<b>13.15 – 14.45 Portraits and Discussion</b>	
10 min	<b>Portrait Co-existence Policy Advisor</b> - Maria de Fátima Quédas, Portugal
10 min	Daniel Perez, Copa-Cogeca
20 min	Discussion
10 min	<b>Portrait Industry</b> - Garlich von Essen, European Seed Association & Willy de Greef, Europabio
10 min	Ivo Brants, Monsanto Europe, Belgium
20 min	Discussion
14:45 – 15:00	<b>Break</b>
<b>15.00 – 16.30 Portraits and Discussion</b>	
10 min	<b>Portrait Scientist</b> - Richard Jefferson, CAMBIA
10 min	Joachim Schiemann, Julius Kühn Institute, Germany
20 min	Discussion
10 min	<b>Portrait Anti-GM Lobbyist</b> - Benedikt Härlin, Save our Seeds
10 min	Digni van den Dries, organic farmer, Netherlands
20 min	Discussion
<b>16:30 – 17:00 Closing Session</b> Chair: Piet Schenkelaars	
15 min	<b>Consumers and biologically contained GM crops</b> Michael Siegrist, ETH Zürich, Switzerland
15 min	Discussion