



**European Cooperation
in the field of Scientific
and Technical Research
- COST -**

Secretariat

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COST 266/09

MEMORANDUM OF UNDERSTANDING

Subject : Memorandum of Understanding for the implementation of a European Concerted Research Action designated as COST Action FP0905: Biosafety of forest transgenic trees: improving the scientific basis for safe tree development and implementation of EU policy directives

Delegations will find attached the Memorandum of Understanding for COST Action FP0905 as approved by the COST Committee of Senior Officials (CSO) at its 176th meeting on 1 December 2009.

MEMORANDUM OF UNDERSTANDING
For the implementation of a European Concerted Research Action designated as
COST Action FP0905
BIOSAFETY OF FOREST TRANSGENIC TREES: IMPROVING THE SCIENTIFIC
BASIS FOR SAFE TREE DEVELOPMENT AND IMPLEMENTATION OF EU POLICY
DIRECTIVES

The Parties to this Memorandum of Understanding, declaring their common intention to participate in the concerted Action referred to above and described in the technical Annex to the Memorandum, have reached the following understanding:

1. The Action will be carried out in accordance with the provisions of document COST 270/07 “Rules and Procedures for Implementing COST Actions”, or in any new document amending or replacing it, the contents of which the Parties are fully aware of.
2. The main objective of the Action is to evaluate and substantiate the scientific knowledge relevant for GMT biosafety protocols by putting together already existing information generated in various European countries as basis for future EU policy and regulation for the environmental impact assessment and the safe development and practical use of GMTs.
3. The economic dimension of the activities carried out under the Action has been estimated, on the basis of information available during the planning of the Action, at EUR 100 million in 2009 prices.
4. The Memorandum of Understanding will take effect on being accepted by at least five Parties.
5. The Memorandum of Understanding will remain in force for a period of 4 years, calculated from the date of the first meeting of the Management Committee, unless the duration of the Action is modified according to the provisions of Chapter V of the document referred to in Point 1 above.

A. ABSTRACT AND KEYWORDS

The potential for unintended consequences of spread of foreign genes (via vertical or horizontal transfer) and of pleiotropic effects following transgene expression may be enhanced in long-lived forest trees. This Action will focus on four key aspects related to the biosafety of genetically modified trees (GMTs): (a) analyses of the efficiency of existing gene containment strategies to avoid or if not possible to minimize gene flow; (b) facilitate efforts to develop site-specific integration of transgenes in tree genomes to minimize variability of transgene expression and pleiotropic effects, (c) evaluate possible methods to monitor GMTs in the whole production chain, and (d) conduct socio-economic and cost/benefit analyses in relation to the use of GMTs in plantations. This Action combines multidisciplinary knowledge generated with transgenic lines of forest trees (such as, *Populus* spp., *Pinus* spp., *Eucalyptus* spp., *Betula* spp., *Castanea* spp., *Picea* spp., etc.) as well as extensive expertise in correlated topics. The information gained should contribute to strengthen the scientific basis for the execution of the EU policy directives related to transgenic trees intended for cultivation in Europe. The knowledge gained will be summarised in a book as a final output of this Action.

Keywords: EU policy directives, socio-economic analyses, transgenic forest trees, gene containment and targeting, monitoring of GMTs

B. BACKGROUND**B.1 General background**

To improve the scientific basis for regulation of Genetically Modified Trees (GMTs) under EU directives and National legislation, it is important to develop expertise including diverse networks of experts for improving strategies for gene containment and gene targeting prior to commercial introduction/distribution of the GMTs into the environment. Such expertise informs political decisions and provides supporting information for European companies aspiring to commercial use of GMTs.

This Action fosters the development of a network of scientists with complementary skills and experience that will interpret existing and generate new biosafety knowledge. This will ultimately be used to guide the safe use and management of GMTs in forest plantations and, at the same time, to protect forest ecosystems. The researchers of the network will also seek to incorporate the knowledge from other relevant scientific disciplines (plant biology, forest ecology, policy and economy) into the process of drafting guidelines according to EU policy needs.

Therefore, considering that the “*mission of the COST is to strengthen Europe in scientific and technical research through the support of European cooperation and interaction between research*” (COST 2008) the implementation of this COST Action is an excellent instrument to stimulate an European-wide scientific knowledge exchange in order to improve the scientific basis on biosafety of transgenic trees.

A large body of knowledge on environmental effects and biosafety issues of transgenic trees has been collected in many countries over the last 15 years. Today there is an urgent need to compile this scattered knowledge to build-up an European knowledge platform. This Action can be used for the implementation of EU policy directives to ensure a safe development and practical use of GMTs in future. Therefore, this Action is expected to generate important benefits as it also foresees a strong collaboration among R&D bodies and legislative directives. This kind of collaboration will be fundamental, on the one hand, to address policy-making efforts and, on the other hand, to allow the scientific community to discuss to public concerns in a responsible way, particularly concerning socio-economic implications and biosafety issues of transgenic tree plantations.

B.2 Current state of knowledge

A number of GMTs have been developed and field tested in the last 15 years. These GMTs carry novel or modified traits such as herbicide and insecticide tolerance, low lignin content and long fibres for pulp and paper production, heavy metal accumulation for phytoremediation, and fast-growing varieties for biomass production (Busov et al., 2005, *New Phytologist* 167, 9–18; Busov et al., 2005, *Tree Genetics & Genomes* 1, 135–142; Robischon 2006, In: *Tree transgenesis: Recent Developments*, Eds. Fladung, M. and Ewald, 3-23. Springer-Verlag Berlin Heidelberg). Because of

the long life cycles of trees and their particular significance in many terrestrial ecosystems, concerns of potential impact of transgenic trees have been raised. These impacts include the uncontrolled spread of transgenes via vertical or horizontal transfer as well as pleiotropic and unintended effects of the transgenes.

Research on biosafety of GMTs has already been initiated in a number of European countries (e.g., Germany, Finland, France, Spain, and other). This research included the potential of release of GMT pollen, the development of containment strategies, and the relationship between the genomic position of the transgene and expression stability. Other studies focussed on the possibility of pleiotropic, often undesirable alterations in plant metabolism and physiology due to the alteration of the transgenic host plant genome. Also effects on composition and activities of soil microbial community as well as the fate of the transgene and proteins from GMTs in soil were monitored (Pilate et al. 2002, *Nat Biotechnol* 20, 607–612; Kaldorf et al. 2002, *Planta* 214:653–660, Hönicka and Fladung 2006, Pasonen et al. 2005, *Scan J For Res* 20: 385-392).

In Canada and China, field trials with transgenic poplar (*Populus* spp.) have been conducted to study the stability of integration and expression of the inserted genes. China recently initiated commercial plantations of insecticide-producing varieties few years ago “Transgenic trees are planted as a commercial crop in plantation forestry and increased number of trials and releases for commercial plantations can be expected” (Robischon 2006, In: *Tree transgenesis: Recent Developments*, Eds. Fladung, M. and Ewald, D. 3-23. Springer-Verlag Berlin Heidelberg). In New Zealand, transgenic pine tree plantations have been tested for an effect on microorganisms and insects living in association with the trees. No effects on these organisms have been detected over a period of 3 years (Lottmann et al, submitted, Schnitzler et al, submitted).

In the future, two main technological aspects need to be included and improved in GMT tree development and in impact assessment analyses: (i) the establishment of efficient containment strategies to avoid vertical and possible horizontal gene transfer, and (ii) the analysis of the transgene insertion loci including number of copies, transgene arrangement and presence of vector backbone sequences to ensure a predictable/reproducible integration and expression event.

i) Containment strategies have already been proposed including the establishment of male and/or female sterility as well as inhibition of vegetative propagation (Sederoff 2007, *Tree Genetics and Genomes* 3, 71-74; Strauss et al. 2004, *Forestry* 77: 455-465; Hönicka and Fladung 2006, *Silvae Genetica* 55: 241-292). ii) It is established that the integration site of the transgene affects stability of the expression which is partly due to methylation and silencing events. In addition, depending on the molecular layout of the integration locus as well the possibility that alternative splicing of the foreign gene may occur, the production of “variants” of the intended protein is theoretically thinkable. In this context, the targeted integration into known genomic positions appears to be a valuable approach. Although gene targeting is possible in plants, albeit with a lower frequency, so far nobody has developed this commercially.

A summary of biosafety research with GMTs has been given in a number of review papers (Pilate et al. 2002, Strauss et al. 2004, Hönicka and Fladung 2006a, 2006b, Valenzuela et al. 2006, Brunner et al. 2007). A IUFRO Task Force on Forest Biotechnology has been established aiming to produce a State-of-Knowledge-Report on forests and genetically modified trees to be presented at the IUFRO World Congress, August 22-28, 2010, South Korea.

Environmental impact assessment strategies and monitoring is documented at the European and International level. Risk characterisation is described in details by the European Food Safety Authority (EFSA) in its guidance document on GM plant (EFSA 2006). The EFSA provides independent scientific advice on the safety of GMOs (Directive 2001/18/EC: deliberate release into the environment of GMOs; Recommendation EC/553/2003: coexistence), and on genetically modified food and feed (Regulation EC/1829/2003). In particular, the EFSA GMO Panel carries out risk assessment in order to produce scientific and guidance documents by reviewing scientific data and information to evaluate the safety of a given GMO.

At International level, several documents are available from US Department of Agriculture (APHIS guidance documents, field database of field trials for more than 40 woody species), the Canadian Food Inspections Agency and other organisations. Relevant documents and research report are produced by OECD in the field of the environmental safety and the food and feed safety in modern

biotechnology (the only one on few woody species in Europe) (2006) and Biosafety Clearing House database (specifically on crops), and Cartagena protocol on Biosafety has to be considered in risk assessment evaluation.

There is already a body of information on existing documentation and risk assessment of GM plants (mainly crops). This information is the obvious starting point for this COST Action program. As the main objective is to evaluate and substantiate the scientific knowledge relevant for GM forest tree Biosafety, it will be one important basis for future EU policy and regulation for the environmental impact and the safe development and practical use of GM forest trees. This is particular important, because the well documented knowledge present in the website and regulations are in mostly part related to crops. In respect to risk assessment of GM trees is has to be considered that forest trees differ in a number of important characteristics (i.e., complex ecosystem, long lived trees, etc.) from agricultural crops. Therefore, it is fundamental to collect the scattered information on transgenic forest trees and make it available for those organisation (as EFSA) and institutions (as state department or Ministries of the Environment etc.) that have to evaluate and regulate any introduction of transgenic tree to the market.

The focus of this COST Action is timely because knowledge in this field is actively sought at the international level. For instance, the US Federal Agency responsible for evaluating the biological safety of GMP in the USA has prepared a report for the Congress by the National Research Council (NCR). Moreover, several scientific meetings focusing on tree genomics and biosafety of GMTs have been organised by IUFRO and other organisations over the last 20 years.

Still, the proposers are not aware of Network collaborations on GMTs, similar to this proposal, under consideration in the EU Framework Programme or in other European organisations, such as EUREKA, ESF, etc. A COST Action on this subject is therefore relevant, and innovative, especially in the context of the existing debate in the EU on the cultivation and commercialization of GM-plants, as the 2912th European Council on Environment showed with the adoption of EU Council Conclusions on GMOs.

B.3 Reasons for the Action

GMTs are currently not commercialized or cultivated in plantations anywhere in Europe. Other countries are considering the implementation of GE trees, including China, Brasil, Chile – and Europe needs to be prepared.

This COST Action, as an immediate benefit, provides the possibility to collect and arrange existing biosafety data at the European level, and focus on delivering improved data and approaches ensuring the safe use of GMTs.

As a future benefit, the results of this Action will support: (i) strategic decision making for GMT use taking into account all relevant biosafety aspects of GMTs, (ii) provide an improved knowledge base for EU agencies in formulating policies regarding the use of GMTs in forest plantations. The latter policy formulation will resemble those made for crops under Directive 2003/556/EC, 23 July 2003.

This Action is aimed both at EU economic/societal needs and scientific/technological advance.

Economic/societal needs

From an economical perspective, this Action will allow information exchanges to improve the European basic knowledge about the importance of forestry and forest trees productions in different countries and constraint factors in this sector. This is highly important to improve R&D efforts on biotech development in trees.

From a societal perspective, this Action will allow to explore and identify the real and perceived importance/utility of forests and plantations in different Europe societies, with a strong accent on how GMTs could ameliorate or deteriorate the citizen perspective.

This is very important to understand the kind of policies needed to meet the concerns of the society which are widely spread in many of the Europe countries.

Scientific/technological advance

From a technical/scientific point of view, the Action will be aimed at selecting specific R&D lines which better meet the European needs in the field of transgenic trees, focusing particularly on those techniques that prevent any impact or if this is not possible to minimize unintended impacts.

Therefore, the objective is to evaluate the status of the research/knowledge about GMTs to give as final output important and useful information to governmental organisation in formulating “policy decision” respecting the safeguard of the environment and the economic/social needs. Considering the complexity of the study, several expertises are needed in different fields (plant biology, forest ecology, forestry, economy, and society) which can be gained only by a Network of experts as this Action is.

Based on the arguments stated above, this Action is timely and focuses on real, societal and environmental challenges and knowledge gaps related to the commercialisation of new biotechnologies, GMTs. The issues are approached by putting together scientific, economic, societal, and policy expertises necessary to have a clear picture and dimension of the problematic.

B.4 Complementarity with other research programmes

This COST Action may have some links with other Actions:

- E36 “Modelling and simulation in the pulp and paper industry”: possible contact and information exchanges with additional end-users.
- E51 “Integrating Innovation and Development Policies for the Forest Sector”: possible information exchanges for the development of policies directives in relation to GMTs.
- FP0603 “Forest models for research and decision support in sustainable forest management”: exchanges similar to E51.
- FP0804 “Forest management decision support systems”: exchanges similar to E51.
- FA 864 “Combining Traditional and Advanced Strategies for Plant Protection in Pome Fruit Growing”: possible scientific and experience exchange in relation to strategy for protection of woody plants.

Project in previous FPs and in the FP7 or other EU Instruments have dealt with transgenic crops and related research (FP6-2006-Food Quality and Safety-Area T 5.4.6.7 Developing Efficient and Stable Biological Containment Systems for GM Plants: “TRANSCONTAINER”; KBBE-2007-2-5-01 Assessment of short and long term effects of GMOs on human and animal health: “Biomarkers for post market monitoring of short and long-term effects of genetically modified organisms (GMOs) on animal and human health (GMSAFOOD)”); PEOPLE-2007-2-1.IEF: “Multiplex detection of (un)authorized GMOs in food and feed (GMULTI)”); EUREKA: “Improving The Drought Resistance Of Corn Via Transformation Of Gene Constructs With Demonstrated Potential”; etc.).

It is to stress that none of the past and ongoing COST Action deals with the biosafety of GMTs and their social/economic relations. The other EU programmes are specifically orientated on GM crops, and derived food and feed.

This Action will contribute to improve regulations in forest plantations and identify important “knowledge gaps” that are currently not addressed and can be solved by new research. New themes for Research Project, which could be launched in the FP7, may be identified.

C. OBJECTIVES AND BENEFITS

C.1 Main/primary objectives

The main objective of this Action is to evaluate and substantiate the scientific knowledge relevant for GMT biosafety protocols by putting together already existing information generated in various European countries as basis for future EU policy and regulation for the environmental impact assessment and the safe development and practical use of GMTs.

C.2 Secondary objectives

Further this Action will provide an improved scientific understanding of the approaches to produce GMTs and of possible biological impact of GMTs on forest ecosystems and plantations. Also public

concerns about or acceptance of the use of GMTs will be discussed considering socio-economics impacts and cost/benefits. Therefore, secondary objectives are:

- To list the principal biological characters of existing and potential GMTs in EU and non-EU countries (D2, D3, D8)
- To evaluate methods for monitoring of the GMTs in the production chain from the plantation to the final products (D1, D4, D8)
- To provide information for further environmental impacts assessment to assist EU policy (D4, D7, D8)
- To give socio-economic and cost/benefits analyses in relation to the use of GMTs useful for policymakers and for forest sector enterprises (D5, D6)
- To report about the concerns or acceptance of the society in different countries concerning the use of GMTs in forestry and plantations (D6, D7, D8)
- To use all the information collected to identify particular topics which could be useful to develop research projects (D8, D9, D10)

The list of the deliverables (D) is reported in PART D.2.

To reach these outputs this Action is structured in 4 WGs and an internal structure to fulfil the objectives and assure an optimal coordination and divulgation of the activity carried out. In fact, the MC is supported by: TC, SMT, and SB (Part E).

The final outcome of the Action is a book which will report the state of art of knowledge and research on GMTs with suggestion on how to effectively implement present EU directives on GMO considering the problematic of forest trees and their environmental impacts.

C.3 How will the objectives be achieved?

The achievement of the objectives is guaranteed by the expertise of the participants to the network which is composed by both Research and Governmental organisations. This assures the complete integration between the knowledge in the GMT biosafety research and the application of this

knowledge for policy decisions. In addition, to better pursue and fulfil the objectives the Action aims at organizing:

- Working Groups to develop the scientific part and the divulgation activities
- Training activities: STSM and summer schools
- Workshops at the national/international level
- Conference presentation of the COST activities/results
- Information dissemination to a wide audience by the updated web site and related activities of the participants
- Publication in international peer-reviewed journals
- Cooperation with national authorities, stakeholders, and decision makers
- Exchange of information with IUFRO Task-Force “Forests and Genetically Modified Trees”).

The scientific and divulgation activities can be easily monitored by the deliverables and milestones of the project. Several “management structures” (SMT, TC, and SB), which support the MC, will be created for internal monitoring and to quickly solve any issue arising during the project (Part E), and to assure the achievement of the objectives.

C.4 Benefits of the Action

Beyond the obvious direct benefits in knowledge collection relevant to the Europe, the collaboration between the scientific parties will decrease fragmentation of research groups and enhance collaboration within Europe to build a critical mass. Hence the Action will increase the competitiveness of European laboratories working in biosafety issues of GMTs in collaboration with decision maker organisations.

This proposal can be considered highly innovative and strategically important for future marketing decisions within Europe, as no such Action or similar projects are currently in progress.

Therefore, expected benefits are for:

Science knowledge

- Identification of best practices in GMTs development and testing to prevent any impact or if this is not possible to minimize biosafety impacts.
- Improvement of the basic knowledge about the environmental impact assessment strategies for GMTs.

Economic and society needs

- Specifications for R&D efforts for the development of biotech trees that address Europe forestry sector demand.
- Identification of real and perceived importance/utility of forests and plantations in different Europe societies, with an emphasis on how GMTs affect the consumer/citizen perspective.
- Identification of specific policies to improve R&D success factors in the field of GMTs.

C.5 Target groups/end users

The research groups participating in the Action will be in active contact with end users, including public bodies (e.g., NGOs as well as organisation at regional and municipal levels) responsible for policy regulation at the scientific, ethic, and environmental levels, and with private industries (e.g., paper, timber).

The continue interaction with the end-users is also ensured by the fact that some of them have already supported this COST Action and have contributed in the preparation of this COST proposal.

Specific potential target groups are:

- Research organisation in the field of transgenic organisms and in related field as ecology, biochemistry, physiology, economy, society and policy
- Relevant National ministries
- European regional authorities (via relevant regional Networks like AREPO – Association des Région Européenne des Produits d’Origine, GMO-free European Regions Network, CRPM – Conférence des Régions Périphériques Maritimes d’Europe, AER – Assembly of European Regions)

- European Commission services (particularly DG AGRI and DG ENV)
- GMO panel of the European Food Safety Authority (EFSA)
- Members of the European COEXNET initiative

D. SCIENTIFIC PROGRAMME

D.1 Scientific focus

The scientific focus of the Action is targeted to improve the knowledge building in a way that can be useful and easily available for both: the bodies which do the environmental risk assessment (at European and local levels but also at International level) and the authorities involved in risk management (e.g. commercial release authorization).

This Action is organised in four main tasks to implement collaboration of scientists, namely to:

- Characterize the GMTs in respect of their genetic and phenotypic features relevant for gene flow, gene containment and gene targeting.
- Study environmental impact assessment strategies and monitor the GMTs along the whole production chain
- Make socio-economics analyses of the use of GMTs considering the concerns and acceptance by the public, the economic potential for GMTs and R&D efforts to be invested, as well as cost/benefit analyses, and propose recommendations for a “biosafety use” of GMTs important for policy duties.
- Through a website, provide science-based information and increase public awareness in the utilization of GMTs in forest plantation and at the same time safeguarding the environment.

Each task will be organised in Working Groups (WGs) to facilitate the coordination and the exchange between and within each task.

D.2 Scientific work plan methods and means

To attain the objectives of the Action the work plan is subdivided in four WGs each with its deliverables useful for monitoring the progress of the Action.

For each WG the main methodology used will be desk research through the use of PC to collect information from internet in specific web-site and specialised scientific journal. Each participant is asked to contribute existing data from own research carried out with own national funds. In addition, a questionnaire will be worked out and sent to institutions to collect data on which GMT are “in the pipe”.

The activities will focus on 11 expected deliverables listed below:

Expected Deliverables (D)

- D1 - Development of protocols for the control of transgene flow and gene containment.
- D2 - Progress in gene targeting strategies for site specific integration of transgenes.
- D3 - Information on the construct and the inserted gene(s) used in the GMT which are already available in the articles published in specialised journals.
- D4 - Providing base for further environmental impacts assessment and monitoring.
- D5 - Socio-economic/environmental and cost/benefit analyses, e.g. for GMTs used for the pulp and paper and other industries in the Europe.
- D6 - Comparison between Europe, USA, China and other countries on regulation and public awareness of GMTs.
- D7 - Biosafety recommendations to assist EU policies on GMTs, forests, their products, and services.
- D8 - Providing a database with the main information on forest GMTs, available to the scientific community and Europe organisations.
- D9 - Providing opportunities for research groups to develop joint research programmes.
- D10 - Information sharing through workshops and meetings, scientific publications in journals and books.

WG1: Biological characterization of GMTs

The task will evaluate existing knowledge including the experience from expert scientists in the field of forest GMTs. Specifically, this WG will collect:

- Literature and methods developed on gene flow and containment strategies;
- Information available on the construct used and trait targeted for GMTs: name of the construct, name of the trait, donor organism, and function of the gene introduced;
- Main information on GMTs: taxonomic status, common name, centre/s of origin, and any other additional information available and related to biosafety (for example: biological cycle, type of pollination, type of pollen and seed dispersal method, etc.)

These information can be easily collected by book and articles already published.

The results of this work will enable the participants and end users to develop a clear factual overview of the status of GMTs in European and non-European countries, and the information provided are useful to make previsions on risk assessment (WG2).

Deliverables: D1, D2, D3, D8, D10

WG2: Environmental impact assessment and monitoring of GMTs in the whole production chain from plantation to final products

The task will compare methods, and collect and evaluate data for an impact assessment and monitoring focusing at the following items:

- Study of impact assessments for crops and other GMOs and from different countries for comparison with GMTs dealt with in this Action;
- Impact of genetic transformation on the plant's "omics";
- Fate of the recombinant DNA plant material and effects of the GMTs on exposed ecosystems,
- The possibility of monitoring tools of the transgene from the production of the GMTs to the final products (wood, pulp, paper, etc.);
- Persistence, integration, and biological activity of the foreign genetic material in the environment.

The results of this work will permit to have a view of the environmental impact of the GMTs already produced and to evaluate if the actual containment strategies are necessary or need to be improved. Integrating the information provided by the WG1 with the activity of the WG2 is possible to make environmental risk and benefit analyses. In addition, the identification of a common protocol to monitor the transgenic from the beginning to the final product is particularly important for a possible “future consumer”. If the transgenic product will cost more than the non-transgenic, the consumer has to know it. In addition, if a consumer has an own idea for which she/he does not want a transgenic product, it has to be given her/him the possibility to choose. For economic/societal needs, it is important to have a method which permits to verify if the transgene is present in the final product and if it is correctly reported on it (this in the hypothesis of future commercialisation).

These findings will be also useful to better support socio-economic implications and policy strategies to be developed in WG3.

Deliverables: D4, D8, D9, D10

WG3: Socio-economic implications of and recommendations for the use of GMTs

The task of the WG3 will use data from the other WG1 and WG2 for consideration in socio-economic analyses and in policy directives on the use of forest GMTs in plantations. This includes:

- Evaluation of existing of cost/benefits analyses for entire region and for specific localities
- Socio-economic analyses of the impacts on European society, which will be compared with impacts in USA and other countries.
- Awareness and acceptance of GMTs by the society
- Developments of biosafety standards for GMTs

This analysis will identify the relative impact of the most economic important species (as poplar, eucalypt, etc) on the European market. Particularly tree farms for the pulp and paper industry, in Europe, with a special regard to the competitiveness ability of SMEs will be considered. Some agricultural producers and suppliers may experience incremental or acute benefits while others may experience more substantial differences. A policy comparison to determine what specific phenomena will allow transgenic trees to become economically viable. Furthermore, it could be

evaluated the introduction of accession countries into the transgenic market. It can be identified the utility and feasibility of these issues within the current atmosphere and the atmosphere created with the introduction of these accession countries. This will be executed by analyzing the socio-economic benefits and costs for the entire region and for the specific localities.

The information provided will be useful for the National and International organisations who has to deliberate and make decision for the safeguard of the environment and of the society. This will permit to these organisation to make the more correct and adequate policy decision.

Deliverables: D5, D6, D7, D9, D10

WG4: Management of intranet - internet websites and dissemination

The task of the WG4 will develop and manage a web site presenting the Action.

Part of the web site will be accessible only to the participants, to communicate among them and with the European Commission.

The other part will be available for public debate, to disseminate the activities and, thus, the knowledge and technology produced beyond the network.

The website will not duplicate general information already available from the COST website. The website will concisely and accurately present the key findings of the study and other aspects of this issue that are relevant to the general population. This will not only educate the general population of the technical, social, environmental and economic aspects of this issue but also its specific relevance to the community. This website will also serve as a forum for the organizations working within and outside the consortium. For example, any effect of a transgenic plantation needs to be discussed in the context of already existing and accepted forestry practise. If that does not happen, activities in this field will continue to operate in a “vacuum”.

An intranet will facilitate communication and information sharing among the participants and with those organisations interested in the data provided.

A WG group specifically dedicated to the management and organisation of the web site is a guarantee of the success of this task. In fact, specialised permanent staff members of the institutions and organisations participating to this COST Action will work on it. It is to notice, that each organisation, university, and research centre has in its permanent staff a web-master specialist already taking care of the own website. Therefore, it will be easily to identify a participant to develop and host the website of this COST Action. This is also a guarantee that the website stay active also after the end of this Action.

Deliverables: D8, D9, D10

To monitor and evaluate the achievement of the objectives the following actions will be foreseen:

i) a specific monitoring protocol, ii) monitoring indicators and iii) sources of verification.

The monitoring protocol will be defined in detail at the 2nd MC by the 6th month. It will foresee the assessment of a set of monitoring indicators on a semester or annual basis (dependently on the used indicator), generally close to reporting activities to the COST Office.

The monitoring indicators consist of:

- number of meetings organized
- number of communication material produced
- number of technical publications produced
- respect of the timing for any activity

Sources of verification are:

- material produced, deliverables and milestones

In the PART E, the milestones useful for monitoring actions and “ad hoc management structures” (SMT, TC, and SB) are reported.

E. ORGANISATION

E.1 Coordination and organisation

A Management Committee (MC) will be responsible for the administration of the activities to be carried out. The MC will establish its rules of operation at its first formal meeting (kick-off meeting) in accordance with existing COST regulations.

Four Working Groups (WGs) will be established, following COST Rule, to carry out the scientific operations according to the envisaged works. Each National Representative of the MC will indicate 2 potential experts to be nominated in the WGs.

Short-Term Scientific Missions (STSM) and Training Schools within this COST Action will be promoted to implement the exchange and interaction between the participants and will favour young scientists (PhD students or post-docs preferably with less than 10 years of research experience).

Possible themes for the Training School are: “Plant genomics, EU policy directive on forest plantation” and “Role of green biotech research, ethical aspect and the dissemination of the scientific results through the media”.

The MC will discuss in details the topic of the Training Schools at the first meeting of the Action and an “ad hoc” Scientific Management Team (SMT) will be nominated for each Training School organised.

The SMT has the responsibility for: programme development, teacher selection within the COST participants and additional 5 scientific experts, recruitment and selection procedure of the students (about 10-15 early stage researchers).

A Training Committee (TC) will be set up for STSM programme and candidate evaluation and selection. The TC will be composed by 4 components of the MC covering different expertise and by the Chair and Vice-Chair of the Action.

The SMT and TC will act in respect of the COST rules and Gender Balance.

Steering Board (SB) composed by each WG Leader, Chair and Vice Chair will have the duty to:

- Monitor the achievements of the objectives (i.e., checking the respect of the Milestones and Timetable),
- Coordinate the divulgation, dissemination activity of the Action and the up-date of the Web Site.

The SB has the responsibility to organise all the information deriving from this Action in a final book with contributions from all the experts involved.

Scheduled of the principal activities to be carried out within the Action:

- a) A kick-off meeting in which the MC will nominate: Chair, Vice Chair, SMT, TC, SB, and WG Leader. At this first meeting the activities of the first year will be planned.
- b) 2 meetings per years of the MC in conjunction with the WGs, and if necessary one additional meeting per year for the WGs
- c) 3 Work Shops
- d) 2 STSM per year
- e) 2 Training Schools (probably during the 2nd and 3rd year)
- f) Semester progress report (internal monitoring)
- g) Annual progress report to COST Office
- h) Final conference (towards the end of the 4th year)
- i) Final Book
- j) Final Report to COST Office

The milestones, i.e., the goals by which the progress of the Action can be assessed are:

MILESTONES	W G	TIME (months)	Means of verification
M1: Decision-making management (TC, SMT, SB)	1, 2, 3, 4	1	General COST Agenda available
M2: Web Site set up	4	6	Web site available for each participant
M3: Web site dissemination	4	12	Web site available for public interest
M4: MC and WGs meeting	1, 2, 3, 4	6, 18, 30, 42	Semester Internal progress report available
M5: MC and WGs meeting	1, 2, 3, 4	12, 24, 36, 46	Annual report available
M6: Results divulgation	1, 2, 3, 4	12, 24, 36	Work shop report ready
M7: STSM completed	1, 2, 3, 4	12, 24, 36, 48	STSM internal report available
M8: Training School organised	1, 2, 3, 4	24, 36	Training School internal report available
M9: List of GMTs with main characteristic	1	30	Data set available on the internal web site
M10: GMTs monitoring	2	30	impacts assessment evaluated
M11: Socio-economic analyses	3	44	Internal report available
M12: Comparison between EU and third country policy	3	44	Internal report available
M13: Biosafety recommendations	3	44	Suggestions and recommendations for forest policymakers available
M14: Final draft of the book (text, pictures, schedules, graphics etc.)	1, 2, 3, 4	46	COST data collected and analysed
M15: Final conference	1, 2, 3, 4	46	Final report available
M16: COST BOOK	1, 2, 3, 4	48	Book printed

E.2 Working Groups

This Action will organise **4 WGs** as previously described.

A Leader for each WG will be nominated and supported by a Task Group (TG), identified within the participants to the WGs, to collect the data, and to investigate special needs arising during the ongoing of the project to reach the deliverables of each WG.

A Vice Leader will be nominated to support and substitute the Leader in those occasions in which the Leader can not be present.

The Leader and TG will refer to the SB on the ongoing of the work to be done respecting the completion of each activity as reported under PART “F.Timetable”.

Each WG Leader will provide a semester internal report to the Chair on the work carried out which will be distributed to the participant institutions as confidential. This report will be useful in preparing the annual report by the Chair.

In general the WGs meetings will be held in conjunction with the MC. Sometimes, some of these meeting could be scheduled with relevant international/national conferences (such as: GMCC11; GMO Analysis; XXIII IUFRO World Congress; etc.) to make best use of the resources and knowledge exchange opportunities.

E.3 Liaison and interaction with other research programmes

Particular cross liaison could be with past and running COST Actions (E36, E51, FP0603, FP0804, and FA864) particularly in the field of forest policy makers but also in related field of the Food and Agriculture Domain (see B4).

Therefore, the Chair and/or representative of the WGs will be invited to join the second meeting of this COST Action to better organise the exchange and integration among these COST Actions. In addition, part of the Web Site will be also dedicated to an internal continuous exchange of information among of these COST Actions.

E.4 Gender balance and involvement of early-stage researchers

This COST Action will respect an appropriate gender balance in all its activities and the Management Committee will place this as a standard item on all its MC agendas. The Action will also be committed to considerably involve early-stage researchers. This item will also be placed as a standard item on all MC agendas.

The MC, the SMT and TC have the duty to respect the gender balance following the European Community indications in:

- the assignation of the responsibility within the Action
- the selection procedure for the STSM
- the selection procedure for the Training Schools

In addition, the MC, SMT and TC will distribute advertisements among organizations open to equal opportunity recruitment. SMT and TC will list on the application form that it is an equal opportunity employer, and it will be asked that professors encourage female students to apply.

The SMT and TC will advertise the STSM and Training Schools internationally using the web site of this Action, the CORDIS server of the European Community (European Mobility Portal), the internet home page of each participant organization, the web site of national scientific organization related to the project subject, mail-lists of the scientific person responsible for each participant, poster at Conferences and Meetings, etc.

The TC and SMT supervise the STSM assignation and participants to Training School, respectively, giving preference, in accordance with gender balance, to early stage researchers recruitment.

Depending on each host or student expertise, the selected criteria for STSM and Training School will be based on the Degree and Curriculum Vitae of each candidate, considering his/her matching to the Action activity (students in field of: economy, sociology, biology, plant physiology, molecular biology, ecology, and biochemistry could be the target groups), followed by recommendations or references letters (even if not mandatory).

The COST rules will be at the base of the STSM and Training School appointment.

F. TIMETABLE

WG1 and WG2: the 1st, 2nd, and the 3rd years are necessary to collect and integrate the information.

WG3: in the 1st year, it will collaborate with WG1 and WG2 to better determine the data necessary for its activity. In the 2nd, 3rd and part of the 4th year, the information provided by WG1 and WG2 will be used in the analyses.

WG4: at the beginning of the 1st year, the website is established, and it will remain active after the end of the Action.

In the 4th year, the activity of all WGs will be focused in reaching the final goal and preparing the final book

The timetable of the activities of the Action is reported taking in account the MC activities and the milestones to be reached by the WGs and by this Action.

Activity	1 st YEAR				2 nd YEAR				3 rd YEAR				4 th YEAR			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Kick-off meeting	•															
MC-WG meetings		•		•		•		•		•		•		•		•
WG1 activity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
WG2 activity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
WG3 activity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
WG4 activity	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Work shop				•					•					•		
STSM			•	•	•	•	•	•	•	•	•	•	•	•	•	•
Training School					•	•	•	•	•	•	•	•	•	•		
Dissemination			•	•	•	•	•	•	•	•	•	•	•	•	•	•
Final Conference																•
Final book																•

G. ECONOMIC DIMENSION

The following COST countries have actively participated in the preparation of the Action or otherwise indicated their interest: AT, BE, BG, HR, CZ, DK, EE, FI, FR, DE, EL, IL, IT, LV, LT, NL, NO, RO, RS, SK, SI, ES, SE, CH, UK.

On the basis of national estimates, the economic dimension of the activities to be carried out under the Action has been estimated at 100 Million € for the total duration of the Action.

This estimate is valid under the assumption that all the countries mentioned above but no other countries will participate in the Action. Any departure from this will change the total cost accordingly.

H. DISSEMINATION PLAN

H.1 Who?

The target audiences for the dissemination are scientific, public and private bodies as:

- Regional, national and European organisations involved in policy making
- Forest owners, private companies and landowners interest in forest plantation and wood production
- Public and private universities and research institutes close to this field (forest, biology, ecology and nature conservation, economy, society etc.)
- General public
- NGOs and other stakeholders

H.2 What?

The divulgation and dissemination of this COST will be carried out through different tools (see E1 and E2):

- Conferences aimed at giving information to general public via mass-media
- Meetings with local stakeholders aimed at sharing information with local communities and relevant stakeholders (environmental and forest associations, etc.)
- Networking meetings to share relevant information with specific interest groups
- Workshops with experts aimed at collecting and assessing information
- Participation to National/International Conferences aimed at presenting/evaluating main findings
- A website for the Action will be established after the start of the activity. The web site will provide goals and objective of the Action, contact addresses and information on STSM. The web site will be regularly updated with announcement of the foreseen meetings and with reports of WGs and annual meetings as well as of STSM results. In addition the web site will be the support for the publications that will be generated during the Action. These publications will be either scientific, aimed at forest practionners or at the general public.

- Project web site which is linked to other web sites correlated to a similar field (such as: <http://www.gmo-free-regions.org>; www.biosicherheit.de; www.cogem.net; <http://www.gmoera.umn.edu/>; <http://www.icgeb.org/~bsafesrv/>; http://pubresreg.org/index.php?option=com_content&task=blogcategory&id=31&Itemid=42, etc.)
- Peer reviewed publications

H.3 How?

Depending from the method chosen, the dissemination can be done by presenting the results as oral or poster communication at congress or meeting, or by interview released to local newspapers or TV, or by internet web site; or by technical articles in peer-reviewed scientific journals and by final project book which will collect and organize all project results and guidelines.

If possible, representatives of the different target audiences (H1) will be invited at the annual work shop in order to encourage multi-disciplinary co-operation on GMT biosafety. In addition, journalists will be invited to the final meeting to communicate the results of the Action to the public.

The MC will sustain an active contact with the COST Forestry and Forest Products Technical Committee by attendance of the chairman or the representative at the meetings of the Forestry Sector Group and by submitting an annual progress report.

The SB coordinate/promote all the activities which plan will be decided at the first MC meeting of each year of this Action.