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# FSC POLICY

## **FSC INTERPRETATION ON GMOS (GENETICALLY MODIFIED ORGANISMS)** FSC-POL-30-602 (2000) EN

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FSC INTERPRETATION ON GMOS: GENETICALLY MODIFIED  
ORGANISMS  
FSC-POL-30-602 (2000) EN

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The Forest Stewardship Council (FSC) is an independent, not for profit, non-government organisation based in Bonn, Germany.

The mission of the Forest Stewardship Council is to support environmentally appropriate, socially beneficial, and economically viable management of the world's forests.

FSC develops, supports and promotes international, national and regional standards in line with its mission; evaluates, accredits and monitors certification bodies which verify the use of FSC standards; provides training and information; and promotes the use of products that carry the FSC logo.

## Introduction

- 1 Definition and interpretation
- 2 Implications for certification
- 3 Potential benefits and risks
- 4 Future developments or options and research

## INTRODUCTION

Since the FSC Principles and Criteria were adopted in 1995, FSC members have pointed out the weakness of the definition of GMOs. Certification bodies have pointed out the difficulties in ensuring a uniform interpretation of this definition in practice. Forestry enterprises have informed FSC that uncertainties about this policy are one reason why they do not seek certification. This paper is an attempt at clarification.

This draft has been prepared by secretariat staff. It does not have official status as an FSC position. After appropriate amendment, with approval by the board of directors, it will be added to the FSC Guidelines for Certification Bodies, which is part of the agreement between FSC, CBs and NIs. Please send your comments to the secretariat.

### 1 DEFINITION AND INTERPRETATION

The FSC Principles & Criteria include two references to GMOs:

**Criterion 6.8** Use of Genetically modified organisms shall be prohibited.

**Definition** Genetically modified organisms: biological organisms which have been induced by various means to consist of genetic structural changes.

The P&C may be modified only by a decision of FSC members, at General Assembly or postal ballot. An interpretation is more flexible, and may be modified at any time, provided that it is fully consistent with the FSC P&C. For increased clarity, the following interpretation is proposed for operational use:

An organism is any biological entity capable of replication or of transferring genetic material. Genetically modified organism (GMO) means an organism in which the genetic material has been altered in a way that does not occur naturally by mating and/or natural recombination or both.

Examples of genetic modification covered by this definition include the following:

- \* Recombinant DNA techniques using viral or bacterial vector systems.
- \* Techniques involving the direct introduction into an organism of heritable material such as DNA prepared outside the organism, including microinjection and micro-encapsulation.
- \* Cell fusion (including protoplast fusion) or hybridisation techniques where live cells with new combinations of heritable genetic material are formed through the fusion of two or more cells by means of methods which do not occur naturally.

The following techniques are not considered to result in genetic modification, on condition that they do not involve the use of recombinant DNA molecules or GMOs as recipient or parental organisms:

- \* in vitro fertilization,
- \* conjugation, transduction, transformation or any other natural process,
- \* polyploidy induction,

- \* mutagenesis,
- \* cell fusion (including protoplast fusion) of plant cells where the resultant organisms can also be produced by traditional breeding methods.

Clones, hybrids formed by natural processes, or the products of traditional tree breeding, selection, grafting, vegetative propagation or tissue culture are not GMOs, unless produced by GMO techniques.

This wording is adapted from EC definitions and Directive 90/220, and from a UK Government Health and Safety Executive publication on Contained Use of GMOs.

## **2 IMPLICATIONS FOR CERTIFICATION**

The FSC General Assembly in June 1999 approved the following motion by an overwhelming majority:

"The GA reaffirms its support for the current prohibition on the use of GMOs by certified forest operations but recognising the growing intensity and complexity of the debate mandates the Board to

- a) clarify the existing definition of GMOs and
- b) complete drafting the FSC policy on GMOs.

This policy should address among other things the Precautionary Principle. A draft of such clarification and policy should be submitted to the membership for review and comment within 6 months."

The use of GMOs is prohibited in certified forests, and would normally constitute a major failure of Principle 6.

Certification bodies will set pre-conditions or conditions on candidates for certification, wherever the candidate forest management units use or contain GMOs in their management, production or research programmes. They will set similar Corrective Action Requests on certified forest management units found to be using GMOs. Such requirements may include eliminating the GMOs, ceasing all use of GMOs, and/or decertification or disposal of the property containing GMOs.

## **3 POTENTIAL BENEFITS AND RISKS**

Recent reviews of the use of GMOs in plantation forestry demonstrate that they offer potential economic and technical benefits, and also carry risks, especially environmental risks for biodiversity and ecosystems. The potential benefits and risks are taken seriously, and are covered by an extensive literature and ongoing research. The need for continued research, safeguards and regulation is widely acknowledged.

The potential economic benefits include increased productivity or profitability. Potential environmental and social benefits may include increased resistance to drought, salinity and diseases, allowing trees to be more easily established for firewood production, soil conservation, shade or windbreaks in marginal environments. They may reduce the use of pesticides, by introducing herbicide, virus or insect resistance. They may reduce the environmental impact of pulp mills, by using trees with modified lignin.

The potential undesirable effects are also numerous. In most cases, the potential effects and the probability of their occurring are uncertain. These hazards, and the uncertainties about

them, are the reason for the prohibition of the use of GMOs in certified forests, stated in the FSC Principles and Criteria.

According to recent publications, the potential hazards of GMO trees include the following:

- 1 Reduced diversity: Plantations using one or few transgenic clones will contain less landscape-level diversity than is currently found in plantations using species or varieties resulting from traditional tree-breeding.
- 2 Asexual transfer of genes from GMOs with antibiotic resistance to pathogenetic micro organisms, and/or suppression of mycorrhizae and other micro-organisms, arising from use of GMOs with antibiotic resistance.
- 3 Spread of herbicide resistance gene in sexual progeny to trees in environments where those trees are undesirable and where the target herbicide is used, and/or increased weed resistance to target herbicide, and/or increased use of target herbicide arising from use of GMOs with herbicide resistance.
- 4 Increased resistance of target insect pests, and/ deleterious effects on natural enemies of the target insects, and/or deleterious effects on non-target insects such as butterflies, pollinators and soil microbes, arising from use of GMOs with insect resistance.
- 5 Changes to structural integrity, adaptation and pest resistance of trees, rate of decay of dead wood, and soil structure, biology or fertility, arising from use of GMOs with modified lignin chemistry.
- 6 Dispersal of transgene to wild or weed populations, with potentially negative impacts, from non-sterile GMO trees, or from those with incomplete or unstable sterility.
- 7 Restricted or monopolistic access to advantages, arising from high costs or limited availability of GMO trees.
- 8 Reduced biodiversity of organisms dependent on flowers and fruits, arising from use of sterile GMOs.
- 9 Reduced adaptability to environmental stress, changes to interaction with other organisms, and increased weediness or invasiveness, in GMO trees with new features.

More knowledge and experience are required before it will be possible to assess quantitatively the magnitude of these risks, or their likelihood. Unfortunately, many of the potential negative effects may arise as a result of field research, even from research designed to test such effects. For this reason, not even research into GMOs may be included in certified forests. Safeguards and restrictions on such research, to allow confident prediction, assessment and avoidance of the risks, are not yet formulated or agreed.

FSC guidelines, strictly interpreted, do not rule against research into GMOs as such, but only against FSC endorsement of forests containing such research. FSC cannot endorse forests containing field trials carrying significant but unquantifiable risks, in the absence of agreed safeguards and regulation.

Research is continuing to develop safeguards to minimise the risks of these hazards. However, this research must be spread over several years. A guarantee of permanent, irreversible sterility would help to reduce several of the risks, but prolonged tests are required to test the stability of induced sterility over time and through a range of environmental stresses. The difficulties of avoiding the spread of transgenes, and the potential negative impacts, indicate that much of this research must be conducted in laboratories or in extreme isolation. Only then will it be possible to agree on the regulations and safeguards needed for further research and field trials.

#### **4 FUTURE DEVELOPMENTS OR OPTIONS AND RESEARCH**

Like all FSC policies, this policy and its interpretation may be changed by due process. FSC welcomes suggestions from interested stakeholders. Already, some stakeholders have suggested that FSC should allow greater flexibility towards certain genetic modifications under research, which might offer environmental, social or economic benefits, without risk to the goals of FSC. Further research may help to better define the risks, benefits and safeguards.

Meanwhile, the risks make it necessary to apply strict and obligatory safeguards for field research trials of GMOs in forestry. As a precaution, in the absence of such agreed and implemented safeguards, FSC does not endorse the certification of forests containing or using GMOs in research or management.

Reference: IUFRO (1999) Position Statement on Transgenic Plantations. Working Party on Molecular Biology of Forest Trees 2.04.06. Position statement on Benefits and Risks of Transgenic Plantations. Oxford, Forest Biotechnology meeting, July 1999.