Disclaimer: unless otherwise agreed by the Council of UPOV, only documents that have been adopted by the Council of UPOV and that have not been superseded can represent UPOV policies or guidance.

This document has been scanned from a paper copy and may have some discrepancies from the original document.

———

Avertissement: sauf si le Conseil de l'UPOV en décide autrement, seuls les documents adoptés par le Conseil de l'UPOV n'ayant pas été remplacés peuvent représenter les principes ou les orientations de l'UPOV.

Ce document a été numérisé à partir d'une copie papier et peut contenir des différences avec le document original.

———

Allgemeiner Haftungsausschluß: Sofern nicht anders vom Rat der UPOV vereinbart, geben nur Dokumente, die vom Rat der UPOV angenommen und nicht ersetzt wurden, Grundsätze oder eine Anleitung der UPOV wieder.

Dieses Dokument wurde von einer Papierkopie gescannt und könnte Abweichungen vom Originaldokument aufweisen.

———

Descargo de responsabilidad: salvo que el Consejo de la UPOV decida de otro modo, solo se considerarán documentos de políticas u orientaciones de la UPOV los que hayan sido aprobados por el Consejo de la UPOV y no hayan sido reemplazados.

Este documento ha sido escaneado a partir de una copia en papel y puede que existan divergencias en relación con el documento original.

649

E

UPOV

TC/34/7
ORIGINAL: English
DATE: February 27, 1998

INTERNATIONAL UNION FOR THE PROTECTION OF NEW VARIETIES OF PLANTS
GENEVA

TECHNICAL COMMITTEE

Thirty-Fourth Session
Geneva, March 30 to April 1, 1998

PHYTOPLASM AND VIRUSES: INFLUENCE ON THE PHENOTYPE OF ORNAMENTALS IN RELATION TO THE EXPRESSION OF THEIR GENOTYPE

Document presented by experts from the Netherlands

PHYTOPLASM AND VIRUSES: INFLUENCE ON THE PHENOTYPE OF ORNAMENTALS IN RELATION TO THE EXPRESSION OF THEIR GENOTYPE

Phytoplasm

Varieties of *Euphorbia fulgens* are known for their cut-flower production (long, unbranched shoots). About two years ago quite well-branching pot plant varieties were developed by the (artificial) introduction of an endophyte (in this case a phytoplasm) into the plant. To date three applications have been filed with the German Plant Varieties Office. As far as is known the phytoplasm is incorporated in the phloem. It is assumed that the addition of its DNA to the extra-chromosomal DNA of the host plant influences the phenotype of that host, which in *Euphorbia fulgens* results in a branching of the plants (among other changes). As long as the plants are propagated vegetatively the branching habit is preserved. Special methods can be used to eliminate the phytoplasm from the plants. The branching is presumably due to the production of benzyladenin.

In *Euphorbia pulcherrima* (Poinsettia) it is an open secret that some organism is responsible for the branching of the plants, and is quite possible that many if not all protected varieties contain the phytoplasm organism without the breeders' rights grant authorities having any knowledge of their presence. It is equally possible that phytoplasm is also present in protected varieties belonging to other species.

Fundamental Questions

– Does phytoplasm belong to the vegetable kingdom or not?

– What is to be considered to be the genotype:

(a) Plant + phytoplasm?
(b) Plant?

Ad (a):

Phytoplasm adds DNA to the host plant. Is the total mass DNA to be considered the genotype?

On this question the following has to be kept in mind:

– the addition could be temporary (could be removed);
– the addition is artificial;
– difference compared with genetic engineering;
– the microorganism is a carrier only;
– the addition of DNA is definitive: it is inserted and incorporated in the genome.

Approaches From The Breeders' Angle

- The presence of the phytoplasm DNA changes the genotype of the host. In this conception of the changed host as the genotype, the total genetic information (host + phytoplasm) present in the organism is considered. The change in the genotype brings about a change in the phenotype, which is the subject of the protection requirement. According to this principle plant breeders' rights could be granted for phytoplasm-influenced varieties (example (a)).

- The phenotype results from the interaction of two genotypes, namely the Euphorbia host plant and the phytoplasm. As the phenotype of the plant is (partly) influenced by another organism, the exercise of that influence requiring not only the DNA but also the organism itself, and as the organism can be eliminated from the plant, the influenced plant does not qualify for breeders' rights (example (b)).

Viruses

Virus organisms do not form part of the genotype of the host, as their DNA is not inserted or incorporated in the host's DNA. A virus can shift the synthesizing activity of a cell to the synthesis of virus particles at the expense of the synthesis of the host's cell components. The nucleic acid of the virus contains the information for its own structure and also information for the shifting in cell activity. As the virus does not belong to or change the genotype of the host but merely makes use of it, and because of its relatively easy removal (by heat treatment), the expression of characteristics based solely on the influence of the virus should not be taken into consideration for the grant of breeders' rights. Consequently, the identification material of all crops whose phenotype indicates a proneness to virus affection should be compulsorily virus-free.

[End of document]