Nonconventional Approaches to Develop Resistance to Peanut Clump Virus: West African Isolate

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Regular surveys carried out in Senegal, Burkina Faso, and Mali from 1986 to 1991 enabled us to demonstrate that peanut clump virus (PCV):

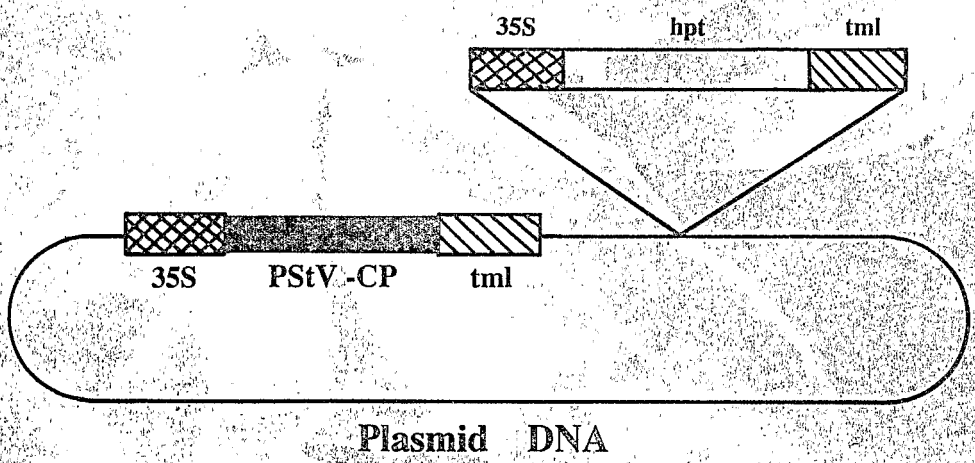
- had a distribution in Senegal from the River Senegal to the Gambian border,
- was particularly common on agricultural research stations, and occurred frequently in breeders' trials,
- was found to naturally infect other cultivated plants such as sugarcane (*Saccharum officinarum*), sorghum (*Sorghum bicolor*), and maize (*Zea mays*), and
- caused a wide range of symptoms in groundnut from the classical stunted plant with dark green leaves (the "super clump") on one hand, to normal-sized plants with a different kind of line pattern on the other.

The widespread distribution of the disease, the high levels of seed transmission of the virus (up to 30% in some assays), and the fact that the disease is soilborne, indicate the importance of this virus in Africa.

In view of these new data, and following an external review of the Institute in 1990, it was decided for the next 5 years of research to provide l' Institut des recherches pour les huiles et oléagineaux (IRHO) with the required resources for future groundnut breeding. Some new approaches need to be developed to provide future tools for breeders, such as in vitro culture techniques to overcome problems in gene transfer. This should assist cell biologists, virologists, and pathologists to undertake research aimed at incorporating resistances to fungal, viral, and nematode diseases into agronomically acceptable groundnut cultivars.

It was decided to study PCV variability at the genome level as the first step in a program of groundnut transformation to induce resistance to PCV. This is being done in collaboration with l'Institut de biologie moleculaire des plantes (IBMP) - Centre national de la recherche scientifique (CNRS) laboratory in Strasbourg. Nucleic acids were purified and characterized. Of three isolates studied, one showed deletion in RNA 2 (1.1×10^6 instead of 1.2×10^6 daltons) and the second isolate was cloned. cDNA and riboprobes were obtained and 90% of the RNA 2 was sequenced. Only the 5' end has not yet been sequenced. cDNA probes are now being made to study variability among PCV isolates.

Transformation and Regeneration of Groundnut, and Utilization of Viral Genes to Induce Resistance to Virus Diseases



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