means of disease control/management, at national, regional and individual farm levels. There are a number of approaches that can be taken to implement a clean seed policy: (1) produce seed crops in areas known to be free of particular pathogens; (2) test and reject, i.e. test seed lots for the presence of particular pathogens and reject if found to be present; (3) test and treat, i.e. test seed lots and treat if found to be present; (4) treat all, i.e. treat all seedlots regardless of health status. When treating seed in the context of a clean seed policy, the aim is generally that of eradication. The term eradication implies the complete elimination/killing of the target pathogen. However, the success or otherwise of any treatment can only be judged in terms of the assay used to evaluate it. Therefore in the context of seed treatment, we should redefine 'eradication' as a reduction of inoculum to undetectable levels. Thus it is important when comparing different treatments reported in the literature to pay careful attention to the details of the assays used to evaluated them and especially to the numbers of seeds examined as this effectively implies the detection limits. Seed treatments may be chemical, physical or biological and may be targeted at one or all of fungal, bacterial or viral pathogens. During the latter half of the last century most emphasis has been given to fungicidal chemical treatments, and most treatment has been done on the basis of the 'treat all' approach. More recently, as a result of increasing concerns about safety and environmental impact, there has been a reduction in the range of compounds available, their spectrum of activity and in some countries a move to treatment only on the basis of proven need. In organic or ecological production systems, treatment with synthetic fungicides is generally not permitted. As a result there has been an increased interest in physical and biological treatments, and traditional hot-water treatments in particular have seen a revival for some crops. This paper will attempt to review the treatment options available for eradication of the different pathogen types and the 'pros' and 'cons' of different approaches.

## PALESTRA 9

**Applied transgenic approach in plant pathology.** Aragão, FJL[1]; Tinoco, ML[1]; Faria, JC[2]; SG, Ribeiro[1]; Cunha, WG[1]; Cruz, ARR[1]. [1]Embrapa Recursos Genéticos e Biotecnologia, Brasília, DF, Brazil; [2]Embrapa Arroz e Feijão, Santo Antônio de Goiás, GO, Brazil; E-mail: aragao@cenargen.embrapa.br. Abordagens transgênicas aplicadas à fitopatologia

A variety of transgenic approaches have been utilized for **studies on plant-microbe interactions** as well to produce pathogen-resistant transgenic plants, some of which have proven to be remarkably successful, especially for virus, nematode, and more recently for fungi resistance. Several strategies have been employed for genetically engineering resistance to viruses, including the expression of coat protein genes, the expression of truncated defective genes and antisense RNA. More recently, the concept of using RNAi construct to silence viral genes has been explored to generate plants resistant to a large range of viruses. RNA silencing strategies have been used for both basic and applied purposes to study plant-parasitic nematodes interactions and obtain nematode-tolerante plants. It has been applied to *Heterodera, Globodera and Meloidogyne* genera species. Regarding fungal diseases, strategies to express antimicrobial gene have been developed, mainly those coding for small peptides. Recently, we demonstrated for the first time the *in vivo* interference phenomenon in the pathogenic fungus *Fusarium verticillioides,* in which expression of an individual fungal transgene was specifically abolished by inoculating mycelial cells in transgenic tobacco plants engineered to express small interfering RNAs (siRNA) from a dsRNA corresponding to the particular transgene. The results provide a powerful tool for further studies on molecular plant-microbe and symbiotic interactions and for the development of broad fungi-resistance strategies in plants and other organisms. Studies on the behavior of disease-resistant transgenic plants under field conditions have been conducted. In this presentation all these aspects will be discussed as well as recent examples from Embrapa research will be presented.