

Detection of Risks Associated with Coat Protein Transgenics

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1. Introduction

Recent advances in the understanding of the molecular mechanisms of how viruses function and how they interact with plants have led to the development of various nonconventional approaches to protection of plants against viruses. Many of these approaches involve the introduction of viral or virus-based sequences into the plant's genome. Expression of these sequences then interferes with one or more of the viral functions, thus giving some protection against the virus. This topic has attracted considerable attention and has been reviewed several times previously (*see refs. 1–16*). The viral genes most frequently used to provide protection are those for the coat protein (CP), the viral replicase, and the cell-to-cell movement protein (*see reviews mentioned above for details*). In the case of CP, protection is often given by the unmodified gene product. However, most other gene products are used in a form modified to affect normal functioning. There is increasing evidence that in some situations it is the expressed RNA, and not the gene product, that gives the protection (*see Chapter 53*).

Many of these transgenic plant lines, and especially those expressing CP, have reached the stage of field testing for the efficacy of protection, and are even being more generally field-released. This raises the question of possible risks that could arise on general field release, a topic that has previously been discussed by Hull (5–7), Hull and Davies (12), de Zoeten (17), and Tepfer (18). Despite these discussions, the issue has not been fully resolved, and various other aspects are being raised. This chapter discusses some of the ways by which potential risks, especially the use of CP genes, could be recognized and circumvented.