the vector is relatively immobile and spreads the virus from one plant to adjoining plants in a concentric pattern, then resistance to the spread of virus can be tested in small plots, again, by measuring the rate of virus spread in both directions from a centrally infected plant in a row of plants. Infective vectors should be caged on the central plant a few days, until they become acclimatized to the situation and spread virus normally. Alternatively, an infected plant can be transplanted at the center of the row, and virus-free aphids placed on this plant. After an appropriate period of time, to achieve spread of virus from the central plant, the plots are treated with pesticide to eliminate the vectors, and disease reading may be taken after an appropriate incubation period to allow for systemic infection of all infected plants.

3.3.4. Risk-Assessment Tests

A risk associated with the release of plant germplasm expressing viral genes has never been documented. However, there is much speculation ***(8)*** that risks exist, based on potential interactions between transgenes or their products and viruses that infect transgenic plants (further discussed in Chapter 51 and 54). The field is an appropriate place to test for these risks, since the plants in the field are exposed to a much broader range of viruses than could ever be achieved under controlled conditions. Risk assessment observations and tests should be integrated into every field evaluation.

3.3.4.1. Synergism and Complementation

Complementation, the process by which a functional gene of one virus corrects for defectiveness in the same function of another, coinfecting virus, is a well-known phenomenon. Thus, expression of a transgene could induce susceptibility in the transgenic plant to new viruses, if the expressed gene provided an essential function that the new virus could not itself provide. To test this possibility, field-test plots should be examined for specific viruses common in the area, but to which the transgenic species is normally immune.

Synergism is the interaction between an infecting virus and the product of a transgene that results in more severe symptoms than should be expected by infection of the parental cultivar. This occurrence would be indicated by severe symptoms that were not associated with alterations in the infecting virus.

3.3.4.2. Transencapsidation

If a virus infecting a transgenic plant were encapsidated with CP produced by the transgene, the infecting virus could acquire the transmission characteristics and serological properties of the transgene virus. These possibilities are easily tested by checking the transmission properties and serological properties of viruses found infecting transgenic plants.