

unwanted pests can interfere with the biological vectors needed to provide virus transmission in the current test. In some instances, pesticides may be available that will selectively control the unwanted pests. Good judgment is required to determine the level of insect and disease contamination that can be tolerated in the selection process.

Selection for resistance among many lines frequently requires selective pesticidal treatments to maintain noninoculated control plots and to protect from other diseases. This can be hazardous when done with backpack spray equipment, and it can be difficult to achieve without drift to untreated plots when performed by machine.

Additional methods needed for plant care during the growing season are the same as those required to select for agronomic performance of transgenic lines, and are described in Chapter 51.

3.1.5. Harvest and Storage

Small plot harvesting without mixing between plots and without labeling mistakes is essential, but difficult to achieve. Careful planning and close supervision is essential. Appropriate storage is especially important in cases in which the virus disease affects storability of the crop. It is difficult to achieve when refrigeration, humidity, and control of atmospheric gasses are required.

3.2. Classifying Resistance

3.2.1. Terminology Based on Viral Function

For commerce, a resistant cultivar is one that remains relatively unaffected economically by disease in the field, compared with the susceptible parental cultivar. This concept serves commerce well, but it deals with the crop as a whole. To deal effectively with the ideas involved in development and assessment of transgenic resistance, we need terminology that specifies how and at what stage the normal viral functions required for virus survival are restricted in the individual resistant plant, and we need to consider how these restrictions imposed by the resistant plant may affect epidemiological processes required for virus survival. We also need to understand that it is not virus infection, but rather the severity of host reaction to infection that causes disease loss. The terminology proposed by Cooper and Jones (4) deals with virus–host interactions in the individual plant and will be used here. In their proposal, a plant is either infectible or immune (not infectible). An infectible plant is classified as susceptible if specific viral functions required for virus survival in the plant proceed with relatively little or no restriction. It is classified as resistant if these functions proceed with considerable restriction. The plant is classified as tolerant if its symptom response is mild, or as sensitive if the symptom response