

2. Materials

Analysis of plants for virus infection at intervals during the growing season requires a laboratory equipped and supplied to perform serological and nucleic acid-based analyses. Facilities are also required for propagation of biological vectors of the virus. The vectors are needed both to provide field exposure to the virus by direct inoculation and to perform diagnostic transmissions. Controlled plant growth facilities are required to propagate plants to be tested, to produce index hosts used for virus diagnosis, and to perform diagnostic transmission assays. Analyses to determine whether viruses that replicate in transgenic plants are altered through interactions with the transgene or its products requires a fully equipped molecular biology laboratory.

Requirements for a satisfactory field site, culture, cultivation, and harvest machinery, a computer database, and tissue-culture facilities are the same as those needed to select for agronomic characteristics, and have been described in Chapter 51.

3. Methods

3.1. Plant Culture

3.1.1. Field Preparation

The standard cultivation and weed and disease control methods used in commerce for the parental cultivar are desirable, since they provide the conditions under which the transgenic cultivar must perform.

3.1.2. Propagation of Transgenic and Control Lines

The type of propagants used in field testing will depend largely on whether the crop is grown from true seed or vegetative parts. Recommended propagation methods are given in Chapter 51.

3.1.3. Growing and Transplanting In Vitro-Produced Plantlets

In vitro-produced plantlets must be transferred to sterile soil or artificial planting medium in small pots, and then transplanted to the field after a period of growth and soil adaptation. Recommended methods for transplanting, disease control, fertilization, and development of a strong root system (**Note 1**) are given in Chapter 51.

Plantlets should be transplanted from the flats to the field while they are growing vigorously. Transplanting machinery may be used for this purpose, but the process requires meticulous organization to prevent errors when hundreds of small, replicated plots are involved (**Note 2**).

3.1.4. Plant Care During Growing Season

Insect and disease control in plots used to select for resistance to virus disease often presents a special problem, since the treatments used to control