3.3.4.3. Recombination

A new hybrid virus could be created by genomic recombination between the genome of a virus infecting a transgenic plant and the transgene or its mRNA. Sedimentation characteristics of the new hybrid would probably be different from the original virus, and its occurrence might be indicated by production of symptoms unusual for any of the viruses that infect the crop species. More detailed analyses for genomic alterations are recommended when these tests indicate a change has occurred.

Alterations in the homologous virus may be difficult to detect, since the alteration may have but minor effects on many properties of the virus. Isolating the altered virions would be difficult unless the alteration provided a competitive advantage in the transgenic host or caused a change in host range that would facilitate its isolation.

3.3.4.4. Outcrossing and Weediness

There is a potential risk that a transgene could be introduced into wild species or other crop plants by outcrossing. This risk exists only when plant species that could potentially cross with the transgenic species grow in the region where test plots are located. It may be necessary to determine crossability by experimentation prior to field testing. A number of approaches may be utilized to control this problem. Male sterility in the parental line used for transformation eliminates the possibility of outcrossing. Removal of flowers from plants in transgenic test plots also eliminates the possibility of outcrossing. Isolation of test plots from other plants may also be practical, depending on the distance required to prevent crosspollination. It may also be practical to eliminate species in the area of the test plots that could potentially cross with the transgenic species for the duration of the testing. Screens could be used to exclude pollinating insects.

There is a possibility that a crop species that normally will not compete as a weed could acquire this ability by virtue of its transformation with a viral gene. To guard against this possibility, test plot areas should be examined for volunteer plants of the transgenic species for 2 yr following testing. Volunteers must be eradicated.

4. Notes

1. A strong root system is achieved in potatoes transplanted to flats from in vitro cultures by watering the plantlets with a 1:250 dilution of a soluble 15-30-15 nutrient solution.
2. For potatoes, we find that hand planting hundreds of small plots is faster and neater, and less subject to error than using a transplanter. Potato hills are established and side-dressed with fertilizer using a standard potato planter. Holes for