GENERAL INTRODUCTION - VIRUSES AND THEIR VECTORS

Under natural conditions, most plant viruses are transmitted by insects. Usually a specific relationship exists between the virus and the vector, any one virus being transmitted by a single vector species or by closely related species. Most vectors have sucking mouthparts and belong to the Hemiptera (aphids, mealy bugs, leaf hoppers and whiteflies). A few have biting mouthparts e.g.beetles, or rasping ones e.g.thrips.

Insect-transmitted plant viruses have been broadly divided into two classes - "persistent viruses" and "non-persistent viruses". Typically the differences between the two groups are as follows:-

I. Infection feeding period

The vectors of non-persistent viruses only need to feed on an infected source plant for a few minutes to become infective. Much longer is generally required by persistent virus vectors.

II. Length of latent period and persistency

The vectors of non-persistent viruses can infect healthy plants immediately they have acquired the virus, but they soon cease to be able to do so, sometimes becoming non-infective within minutes and always within hours of leaving the infected plants. The vectors of persistent viruses cannot transfer an acquired virus immediately to healthy plants - there is a "latent period" between infection feeding and development of infectivity. Once infective, however, these vectors may remain so for long periods, sometimes for the remainder of their lives. The latent period appears to be the time taken for the virus to reach the salivary glands in sufficient concentration to give a reasonable chance of infection.

III. Sap-transmissibility

Sap-transmissible viruses are usually of the non-persistent type. Most persistent viruses are not sap-transmissible; exceptions are found among those transmitted by biting-insect vectors (Dale, 1953).