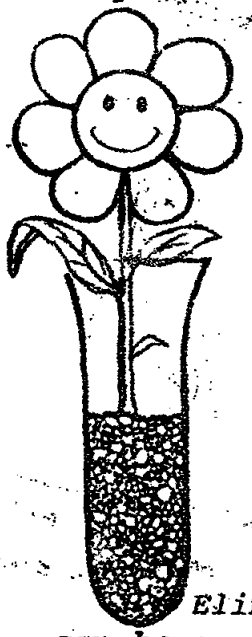
and communication. The average duration of a program in each subject matter area should be at least 4-6 days, as it is preferred as the ideal training duration by the village level extension workers.

As a follow-up measure, it is recommended that: (1) A systematic communication be maintained with the trainees after training them to provide them useful and brief information on a regular basis through fact sheets.

(2) Trainees should be provided a forum for them to ask questions and find solutions to the field problems they encounter, by a suitably designed correspondence system.



MERISTEM CULTURE TECHNOLOGY AND POTATO VIRUS

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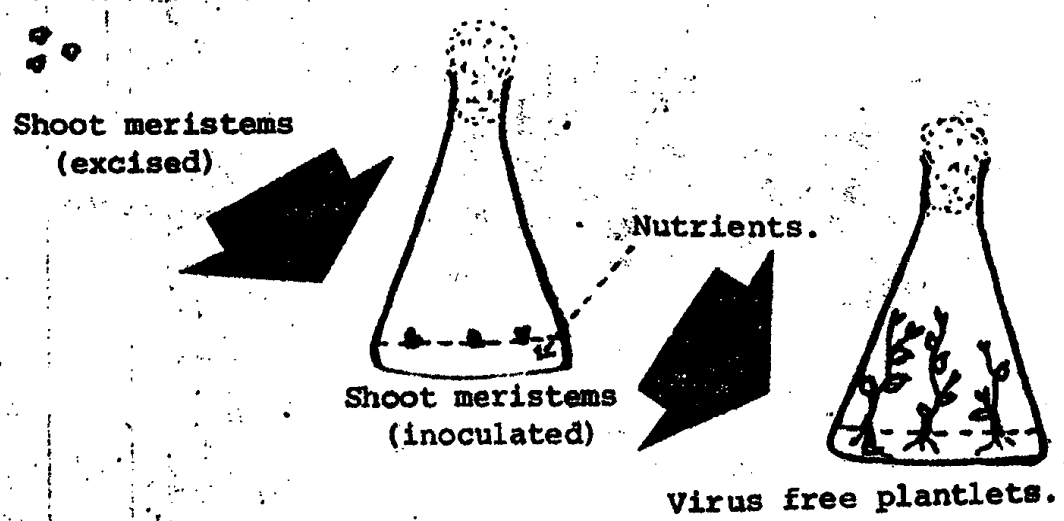
Elimination of virus from virus infected seed potato can be a possibility in Sri Lanka in the near future. This conclusion is a result of a joint Biotechnological investigation done by the Division of Botany of the Central Agricultural Research Station (A.R.S.), Sita Eliya. Preliminary studies were carried out with several cultivars (Krushi, Sita SE$_1$, 58/1A,28/40) of infected seed potatoes obtained from the A.R.S., Sita Eliya. The method used involves the cultivation of meristems with 1-2 leaf primodia of the infected plants in vitro.

The technique of developing virus free plants by propagating meristems excised from infected plants was based originally on the theory that the virus is unevenly destributed in the host plant. Thus a sufficiently small piece of tissue might be virus free. There is also evidence that virus concentration is reduced acropitaly. This is also supported by the fact that virus movement is considerably slower through the symplasm than through the vascular system, and vascular differentiation occurs away from the shoot apical meristem. The mechanism of

virus eradication during culture is not known. Some believe that it may be due either to some inactivating factor produced by the explant or to the effect of some constituents of the culture medium on the virus. Recently another theory was put forward. Viral replication requires enzymes that are normally available to the cells near the meristematic dome. When small tips are excised their growth processes are temporarily disorganized, and the enzymes that are required for one or more steps of viral replication become unavailable thus interupting the production of infective virus.

Independent program have been evolved in various parts of the world to eradicate virus from important potato cultivars. However, the elimination of virus disease depends on several inter-related factors, such as the virus to be eliminated the size of the explant for culture, and physical or chemical treatments



applied to the infected plants or to the cultivars. Several potato viruses have been identified, and listed according to increasing difficulty as follows: potato leaf roll virus (PLRV) potato virus A (PVA), potato virus M (PVM), potato virus X (PVX), potato virus S (PVS) and potato spindle tuber virioid (PSTV). Infections with more than one virus have also been eradicated by meristem culture. However since elimination of virus does not bring about immunity, reinfection must be expected. The speed of reinfection and the nature of preventive measures to be taken are largely determined by the epidemiology of the virus involved.

During the past few years several new varieties have been produced and many high yielding types have been introduced to Sri Lanka. These cultivars are normally

propagated by seed potatoes. Every year the Government imports seed potato as the local production is inadequate. With the introduction of new cultivars some of the virus diseases have spread throughout the potato growing areas. Some of these diseases are prevalent in the potato germplasm maintained in Sri Lanka. Many cultivars which were once popular and productive, generally decreased in vigour and yielding capacity due to these diseases. The tuber yield of the infected potato plants is significantly reduced and this leads to a great loss to the farmer and also to the country. Most of these virus diseases are systemically infected and are transmitted with the seed potato. Diseases spread at a considerable rate as the infected tubers cannot be easily identified and as the pathogen is not easily detectable before cultivation. The virus disease symptoms can be observed only when the plant has grown up to a certain stage. The problem encountered with this situation is that once a systemically infected virus disease is transmitted from one vegetative generation to the next, this process may go on for several years. ultimately the whole crop would be affected. To overcome this problem maintenance and distribution of a disease free stock of seed potato is essential.

So far no chemical has been produced to control virus diseases of infected potato plants. Breeding for resistence to virus diseases while retaining all other valuable agronomic characters is generally difficult. Production of virus free plant material could be a short term approach to restoring yield and quality in local cultivars of potato. The most successful method so far adopted for the purpose is the meristem culture technology. This technique would also help to develop a more reliable and efficient method for germplasm preservation and international exchange of potato germplasm with less quarantine problems.

In the past, on several occasions, the Department of Agriculture had spent a considerable amount of foreign exchange, to purify the infected cultivars by sending them to the laboratories of advanced countries. Development of this technology in Sri Lanka would help to purify the infected potato cultivars within the country, resulting in saving of a considerable amount of financial resources and time. Further, this would also enable us to utilize; In vitro cultures for the maintenance and international exchange of disease free potato germplasm.