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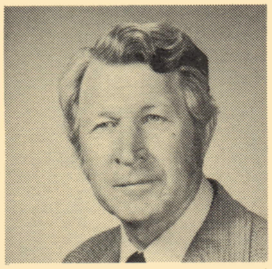
SYMPOSIUM PAPERS AND AUTHORS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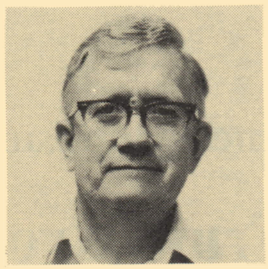
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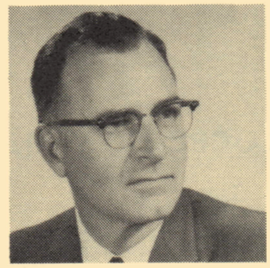
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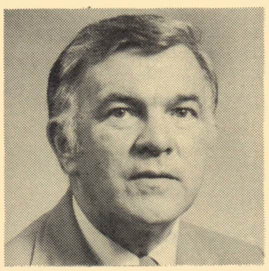
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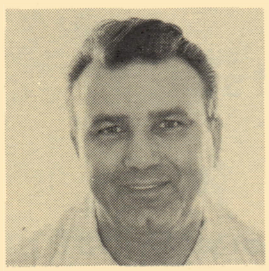
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INTRODUCTION TO THE SYMPOSIUM

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Viruses and virus-like disorders have been observed in plants for many years. The economic importance of some are obvious, e.g. cull fruit or dead plants, but until recently the effects of some of the less serious viruses had not been determined in detail. Prior to World War II a good deal of the virus research was done in England and the U.S., but since then such work has expanded rapidly throughout the world.

Some viruses are transmitted by insect or mite vectors, some by soil organisms such as nematodes, while some are transmitted only by budding or grafting. The mode of transmission and the speed of spread are important to know in developing control or protection practices. For example, *Prunus* ringspot virus is transmitted by pollen from infected trees and would be difficult to control if cross pollination were required for fruit set. On the other hand vein yellows virus in pear, which is transmitted only by grafting, can be maintained free simply by propagating virus-free nursery trees.

Symptom expression include severe marking or deforming of fruit, severe marking or necrosis of leaves or stems, slight visible markings, or no visible symptoms at all. Obviously the worst economic situations exist where the fruit is damaged or where the plants die. Severity of a disorder can be complicated with compound (grafted) plants involving two or more genetic systems. In some cases a virus-induced graft incompatibility occurs causing weakness or death. An example of such a disorder is pear decline (now considered to be caused by a mycoplasma), in which the vector, pear psylla, inoculates the organism into leaves of a tolerant cultivar. The mycoplasma then multiply and migrate in the phloem to the base of the tree, where, if the rootstock is susceptible the presence of the organism causes phloem necrosis and girdling of the tree, followed by root starvation and death of the whole tree. Such disorders seem to occur only on grafted plants.

General growth and plant size are often affected by the presence of one or more viruses, some of which are symptomless. Most reports indicate that virus-infected plants are smaller than virus-free ones. Because of the long potential life of perennial fruit plantings, it is important to have the proper spacing for optimal yield. Thus spacing dimensions for virus-free plants would be too great for infected plants of the same cultivar. If it is not known whether the planting stock is free of virus, spacing may be closer than usual but with provision for removal of alternate "filler" trees if needed later on.

Plant efficiency as well as plant size can be altered by virus infection. Intensity of bloom, fruit set, fruit growth, or all three also can be altered. Beneficial effects have been inferred in a few cases but most data indicate a reduction in total productivity. Some cultivars are influenced more by virus than are others of the same species. More long-term studies in this area are needed.

Many horticultural cultivars have been used for 100 years or more and through time have become infected with one or more viruses, so that no virus-free stocks of them exist. In such cases heat treatment at $37^{\circ}C$ followed by tip excision and graftage to clean stock has been successful in eliminating some or all viruses from that individual. This single source can then be increased asexually to provide ample planting stock for new commercial plantings.

In horticultural production, development of efficient healthy plants is a joint effort of horticulturists and virologists working in concert rather than in isolation from each other. The virologist must learn and accurately describe the etiology of each disease. The horticulturist must test the plant system and understand the ways in which an infected plant differs physiologically from a healthy one. By working together both members of the team will better understand the host-pathogen system. The present symposium was organized in a sincere effort to enhance this needed scientific symbiosis.