

## FRIDAY AFTERNOON SESSION

### FIELD TRIP TO UNIVERSITY OF CALIFORNIA AT DAVIS AND TO CALIFORNIA STATE FORESTRY NURSERY

The following projects were shown:

*Selection of nematode resistant fruit tree rootstocks*

— C. J. Hansen

Peach and other fruit tree rootstocks are being tested for resistance to two species of root knot nematodes, *Meloidogyna incognita* and *M. javanica*. The species of nematodes are kept in separate containers and the populations are built up by growing tomatoes for about 5 months. The seedlings or cuttings to be tested are then grown for about 5 months, after which time they are measured and the roots graded for number of galls. If galls are present, they are also examined to see if the nematodes are reproducing on the roots.

*Germination of dormant peach seeds*

— William Lipe, graduate student

Seeds of peach and many other temperate-zone deciduous plants are dormant when ripe and require stratification before they will germinate. Removal of seed coats of peach seeds and exposure to about 68°F. can result in the production of normal seedlings without stratification. This shortened treatment would be of value to the plant breeder by shortening the time, perhaps by a year, required to evaluate progeny.

Two factors appear to be involved in the dormancy of these peach seeds: (a) the inhibition of germination by the seed cover and (b) physiological dwarfing controlled by germination temperature. How seed coats inhibit germination is being investigated. Possible chemical inhibitors are extracted, and an attempt is being made to identify such inhibitors and to determine what changes they undergo during stratification.

*Root initiation on cuttings* — Dr. K. Ryugo

Hartmann, Hansen and Griggs of the Pomology Department have found that while Old Home cuttings rooted easily when treated with indolebutyric acid, the percentage of Bartlett cuttings, similarly treated, was relatively much smaller. Mr. Fadl, an Egyptian graduate student, and Dr. Hartmann are assessing various factors which might be contributing towards the relative ease or difficulty of rooting of Old Home and Bartlett cuttings. Concurrently, Ryugo and Fadl have exchanged buds of Old Home and Bartlett to test their thesis that the buds of the former produced more or less inhibitors than the latter clone. Buds and leaves collected at different times of the season are being bio-assayed for growth inhibitors and accelerators to ascertain whether or not their balance can be correlated with the behavior of the stocks. Attempts will be made to relate these findings to the rest period of the buds.

*Tissue culture* — Dr. Dale Kester

Tissue cultures are small pieces of plant growing without roots or stems in artificial media containing minerals, sugar, vitamins and growth substances. This contains naphthaleneacetic acid, kinetin, vitamin B1, choline and 1-cysteine. Cultures are started as small pieces of callus smaller than a match head, which will grow to about the size of a nickel in six weeks. They are then cut up to start new cultures. Under such conditions, tissue can be kept alive indefinitely. This technique is being used to investigate noninfectious almond bud-failure, a serious, hereditary disorder in certain almond varieties. Studies are also being initiated to investigate differences between easy-to-root and hard-to-root almond, peach, and peach-almond hybrids and to study the incompatibility reaction in almond/plum graft combinations.

### PRODUCTION OF VIRUS-FREE MATERIAL

DR. GEORGE NYLAND

*University of California, Davis*

DR. A. C. GOHEEN

*U. S. Dept. of Agriculture*

Obtaining and maintaining virus-free sources of our common varieties of fruit trees and grapes are cooperative endeavors by the University of California, United States Department of Agriculture, and the California Department of Agriculture.

Plant pathologists of the University and the United States Department of Agriculture obtain clean stocks by field selection and indexing and where necessary by heat treatment. The Foundation Plant Materials Service maintains the clean stocks in foundation plantings and makes them available to growers, and the California Department of Agriculture supervises registration and certification programs.

Standard host ranges are used to index grapes and stone fruit varieties. The 8 known viruses of grapes can be detected on 5 indicator varieties and some 20 or 25 stone fruit viruses can be detected on 8 indicator varieties. Visual inspection and selection also are important parts of the procedure.

Heat treatment can be used to free infected varieties of grapes and fruit trees of viruses. Plants in pots are placed in the heat treatment room and held at 100°F. With grapes new shoot tips are removed at desired times. Clean shoots can be obtained from fanleaf, yellow mosaic, and veinbanding vines after 28 days, and from leafroll vines after 56 days. With stone fruits, dormant buds are removed from the heated plants after treatment for 2-6 weeks depending on the virus involved. Four viruses of grape and more than 15 viruses of fruit trees have been inactivated in living plants by heat treatment. Recently we have also inactivated at least 1 virus in rose.

Virus-free vines and trees make superior planting stock and yield more fruit of better quality.