

*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 l-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

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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.