

LEMON TREE DECLINE

The principal cause of premature decline and collapse of many commercial lemon trees in California has been attributed to an inherited factor or factors causing an internal girdling—sieve-tube necrosis in the lemon bark. Severity of the disease may be influenced by environmental factors. Trees of many lemon strains continue to be evaluated for their tendency to develop sieve-tube necrosis and decline. Eureka lemon trees, old-line and nucellar-line alike, as well as Villafranca trees and those of some strains of the Lisbon variety decline prematurely. Trees of several vigorous strains of Lisbon lemon found to be practically free of sieve-tube necrosis provide a good means of avoiding this lemon decline problem in areas to which they are horticulturally adapted.—*E. C. Calavan, Dept. of Plant Pathology, Riverside.*

SOIL DISINFESTANTS

Soil plots in a citrus orchard heavily infested with citrus nematodes and four kinds of root rotting fungi were injected at the 10" depth with several dosages of various fumigants. Plots with three of the disinfestants were covered with polyethylene sheets and those with three other chemicals were not covered with the sheeting. Isolations from the first and second feet of soil, made one month after treatment, indicated that certain dosages applied were effective against the five kinds of root parasites. Lower dosages of the chemicals did not adequately control any of the organisms. Citrus nematodes were controlled with lower dosages of the fumigants than were the fungi.—*R. C. Baines, L. J. Klotz, and T. A. DeWolfe, Nematology and Plant Pathology, Riverside.*

ONION HYBRIDS

Hybrids between the common onion and the Japanese bunching onion were first made in 1931. The Japanese bunching onion is of minor commercial importance in the United States, but is quite resistant to a number of serious onion diseases. The hybrid, unfortunately, is quite sterile, so that little progress toward incorporating the valuable characteris-

tics of the two species has been made. The common onion had its origin in south central Asia. Therefore, wild species from that area were secured, in the hope that they might be closely enough related to the common onion to be crossed with it. In cooperation with the U. S. Department of Agriculture, crosses of the wild species with the common onion were attempted. Two distinct species have been successfully crossed, and hybrids of these are now being grown at Davis. The fertility of these hybrids is unknown, and it is yet to be determined if new and valuable characteristics can be incorporated into the common onion from these wild relatives. This is the first time in many years that attempts have been made to incorporate new characters from related species into this common vegetable.—*Louis K. Mann, Dept. of Vegetable Crops, Davis.*

GIBBERELLIN AND ABSCISSION

Gibberellin, like auxin, the other well known plant hormone, is proving to have complex and sometimes opposing effects in plants. This is illustrated by the effects of gibberellin on abscission. Applied to flowers and young fruits of tomatoes and cotton, it promotes fruit growth and thereby indirectly prevents abscission of young fruit. Sprayed on foliage, gibberellin usually has little abscission effect but sometimes retards senescence and abscission. However, in experiments with excised material, gibberellin accelerates abscission markedly when applied close to the abscission zone.

It appears likely that gibberellin interacts in a complex way with auxin and with the abscission accelerating hormone, abscisin, to control abscission in plants. Investigation of the interrelations of these hormones is being continued.—*F. T. Addicott, Dept. of Agronomy, Davis.*

HEAT, MOISTURE TRANSFER

International cooperative research by California workers in irrigation and agricultural engineering and by Australian workers in meteorological physics is directed at the final proving of an instrument that can provide reliable measurements of moisture and heat transfers in the atmosphere above natural surfaces.

The Australian researchers have developed a sensing unit designed to measure the vertical velocity of air above a surface as well as the wet-bulb and dry-bulb temperature of the air. A companion unit—a suitcase-size transistorized computer—gives direct readings of the flux of heat or of moisture in the atmosphere. The accurate performance of the instrument—the Evapotron—has been verified in Australia by an energy balance study.

In California, a sensitive 20' diameter lysimeter installed at Davis provides measured values of evaporation from the soil and plants which can be compared directly with simultaneous measurements by the Evapotron as an additional reliable check on the performance of the new device.

One great advantage of the Evapotron is that measurements of heat and moisture transfer in the atmosphere can be made over any surface without disturbance of natural surface or sub-surface conditions.—*William O. Pruitt, Dept. of Irrigation, Davis.*

POTATO NUTRITION

Potato crops grown in the Copic Bay area of the Tulelake Basin in northwestern California have not yielded as well as plantings made in other local areas under similar cultural practices. Data obtained from recent field trials indicate that phosphorus availability is a factor. Results from further tests conducted in the greenhouse have also shown that the availability of one or more minor elements seems to be another factor.

It has become apparent from these studies that by adding phosphorus to the soil a minor element deficiency condition may be enhanced. The degree of deficiency during the growing season may be influenced by soil temperatures. Further investigations are being made on the nature of minor element availability in this particular soil. In addition, the availability of minor elements with changes in soil temperature in general needs further investigation.—*Herman Timm, Dept. of Vegetable Crops, Davis.*

Control of brown-checking of celery is the object of a current research project in the Department of Vegetable Crops.