

The manner in which the fruit is adhering to the tree, the degree of yellowing in the ground color, and the firmness of the flesh appear to be the most dependable indexes to picking condition. A recent Department Bulletin discussed in detail the proper time of picking most of the important commercial varieties.

J. R. MAGNESS.

ASEPSIS for Plants from Abroad

The dangers attending the introduction of plants from foreign countries have in recent years become so painfully apparent that it has led to the erection of numerous quarantine barriers and even raised the question as to whether the benefits from such introductions are commensurate with the risks involved. There are many weighty reasons, however, for continuing a guarded interchange of plant material between different parts of the world. The plant breeder, in particular, has a vital need for new introductions, especially for the wild relatives of cultivated plants. It thus becomes essential to work out an improved technique for the care of importations, and an excellent start has been made in connection with the handling of citrus plants introduced from the Old World. The occurrence of citrus canker, an insidious bacterial disease the eradication of which in the Gulf States in recent years has cost several million dollars, made necessary special precautions in handling citrus material, precautions which appear easily adaptable to other bud-propagated plants.

The first step is the construction of an insect-proof propagation house, with specially designed ventilator screens and oil moats to prevent the entrance of insects, as well as to see that no insects introduced with the plants are allowed to escape. This is vitally important, since insects are often the active spreaders of disease. The second step is the adoption of a system of "aseptic" plant propagation. This involves as a matter of routine the disinfection of clothes, tools, and person on each visit to the house; but the new feature evolved for citrus propagation is the double transfer of buds from all original plants. As received from abroad all plants are disinfected by fumigation or otherwise and placed in a metal "knock-down" screened cage (fig. 12) where they are held until new growth is made suitable to use as bud wood. If this new growth is entirely free from infection or infestation, buds are taken and inserted, by budding or grafting, on vigorous home-grown stocks held for that purpose in the "isolation ward" of the quarantine greenhouse.

Original Plant is Destroyed

As soon as these new buds are safely established and growing, the original plant, with any adhering soil, is placed in a covered container (fig. 12), transferred to a furnace and completely destroyed. The screened cage, readily taken apart, is sterilized with live steam or dry heat before being used again. When the budded plant has made sufficient growth, butts are taken from it—a second transfer—and inserted on new, clean stocks. If these second budded plants prove to be free from infection, they are admitted to the propagation

bench of the main quarantine house; but before being sent out for field trial they must still be subjected to a lengthy period of detention and rigid inspection. No plant that has not an absolutely clean bill of health is ever released from the quarantine house.

The aim of this procedure is to make certain that no portion—root, branch, bark, or bud—of the original imported plant is ever released from quarantine. Only new, clean plants, “regenerated” by bud transfers, come forth after this vigorous regimen. As a result of this special equipment and procedure, the citrus-quarantine greenhouse, instead of being a sort of plant “pest house,” as it might easily become, is as nearly absolutely clean in a horticultural sense as it is humanly possible to make it. No system, of course, is proof against personal carelessness and ignorance, and success in such work presupposes intelligent management. So far as the expense of insect-proofing the house is concerned, it has been found that the added thrift of the plants, freed from insect depredation, more than offsets the cost and trouble of installing the necessary equipment. And as modern medicine has developed a system of aseptic surgery, so must modern horticulture recognize aseptic propagation, in a liberal sense, as possible and vitally necessary in dealing with imported plants.



FIG. 12.—Section of “isolation ward,” United States Citrus Detention Station (plant-quarantine greenhouse), Bethesda, Md., showing all-metal “knock-down” plant cages for handling separate importations, each cage surrounded by oil moat. Attendant is about to consign original plant to metal container for final destruction by fire after buds from it have been established on new stocks. Note jar of mercuric chloride solution (1 to 1,000) for sterilizing tools, hands, etc.; also attendant’s one-piece suit, which may be sterilized frequently. Plants in wire-screened cages may be watered and inspected without opening doors.