

MODERATOR SPRING. Mr. Maunsell Van Rensselaer was originally scheduled to be the Moderator for this section of the program, but he became ill shortly before the meeting. It is too bad that he could not be here because, as we all know, in his work at the Saratoga Horticultural Foundation he is particularly interested in selecting clonal forms of trees for plant propagation. As he finds a worthwhile specimen he is, of course, interested in registering and patenting it and making sure that the ultimate purchaser gets stock of the named clone that he is requesting. And, more or less, this is the type of program we are presenting to you this morning. Our first participant in this session is Dr. Curtis J. Alley who is an Associate Specialist with the Agricultural Experiment Station at the University of California, Davis.

Progress in the Production and Distribution of Registered Stocks

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Certification programs are not new. G. H. Berkeley, speaking at the 14th International Horticultural Congress in 1955, reported that Canada probably had one of the first certification programs. It was inaugurated in 1915 in Ontario for the certification of seed potatoes. Previous to this (1910) Ontario attempted to control certain stone fruit viruses, such as those which cause peach yellows, little peach, and "X" disease of peach by requiring annual inspections of orchards. In 1924-25, certification of virus-free red raspberry planting stock was initiated. In 1947 a certification program was started for virus-free cherry budwood based on an indexing procedure. The States of Washington and Oregon have informal certification programs for virus-free cherry trees. J. A. Milbrath reported on such a program at the Oregon State Horticultural Society meeting in 1947. At first the program was very successful, but it gradually deteriorated because of lack of proper maintenance for virus-free trees. In 1957 the program was started again, with improved facilities for the maintenance of virus-free stocks. The State of Washington also has a successful cherry certification program. It is based on visual inspections as well as indexing to test trees for freedom from virus diseases.

In California there are at present certification programs for strawberry, cherry, citrus, avocado, grape, and garlic. Most of this report will be restricted to the cherry and grape programs (the two programs currently underway at Davis.) Consideration also will be given to future stone fruit programs.

Prior to 1950, pathologists and pomologists of the University of California had been visually selecting cherry trees for virus freedom

as well as for quality and production. These included also any virus-free stocks that were available from other experiment stations. In 1950 a program was started by the California Department of Agriculture to develop a method for certifying that fruit, nut trees and vine nursery stocks were virus-free. Previously published knowledge of cherry virus diseases was utilized to index selected trees in order to determine their freedom from viruses. Budwood was taken from selected trees. A portion of the buds from a few budsticks was placed on 5 host trees: Bing, Montmorency, and Shirofugen cherry, Elberta peach, and Italian prune to test for known virus diseases. The remainder of the buds from the same budsticks were placed into Mahaleb seedlings which had been grown from seed taken from trees that had been given the same indexing and found to be virus-free. These budded trees on Mahaleb root were maintained in isolation until indexing was completed. If no virus disease was found after two years indexing, the budded trees were then designated as registered trees. While the trees were being indexed, personnel of the University of California, United States Department of Agriculture, and California Department of Agriculture worked closely to establish regulations for a registration program. The regulations were adopted in September, 1956. In order to maintain freedom from virus disease, the budded trees are grown inside a plastic, insect-proof, 32x32 mesh screenhouse, located 1/4 mile from the nearest peach tree. An area adjacent to the screenhouse is set aside for growing limited quantities of registered Mahaleb and Mazzard liners, and registered budded trees of the varieties in the program. The registered Mahaleb and Mazzard trees from which seed is obtained are grown in the orchard. Each seed tree is visually inspected twice each year and given an indexing on Shirofugen flowering cherry. Each registered tree that is grown inside the cherry screenhouse receives this same inspection and indexing. Nurseries or growers who wish to participate in the program must notify the California Department of Agriculture of their intention. Isolation is one of the main requirements for participation. A certified planting must be at least 300 feet from the nearest tree of Prunus, or at least 1/2 mile from any such commercial planting. Following an inspection of a proposed planting site, the state nursery service notifies the University of those growers who qualify. Active participants are given preference in the distribution of registered plant materials. Each year registered Mahaleb seed and liners are distributed, primarily to such participants. When registered Mazzard seed and liners are available, the same procedure is followed. In the spring of 1961 approximately 10,000 registered Mahaleb liners and 800 registered Mazzard liners were distributed. This fall approximately 100 lb. of Mahaleb seed and 10 lb. of Mazzard seed from registered trees, and 85 lb. of Mazzard from nonregistered (ringspot negative) trees were distributed. There are 15 registered Mahaleb trees, 11 registered Mazzard (Saylor), and 1 registered Silverbark Mazzard tree from which seed is obtained. There are 6 varieties and 2 rootstocks in the cherry registration program. Registered budded trees of commercial varieties are distributed primarily to nurseries or growers for developing mother and increase blocks. It is from these sources that commercial quantities of buds and scions are obtained. There are now two nursery-growers who provide certified budwood of different fruiting cherry varieties in commercial quantities primarily to



nurseries in the certification program. There are two commercial nurseries who maintain their own registered trees for collecting budwood. Each lot of seed from a registered tree, bundle of liners grown from seed from a single registered tree, or registered budded tree bears an appropriate orange registration stock tag issued by the California Department of Agriculture.

In the spring of 1959 an addition to the screenhouse was built so that the program could be expanded to include other stone fruits. In the winter of 1959 the California Department of Agriculture made cuttings from selected trees of 17 peach varieties, 2 peach rootstocks, and 1 nectarine variety. Part of the cuttings from each tree was used for indexing. The remainder was used for propagation of progeny trees, which are in their second year's growth in the screenhouse. After two years' observations on indexing, those trees that are found to be virus-free will become registered and permanently established in the screenhouse.

Work is started on a second addition to the screenhouse, intended primarily to house the remainder of the stone fruit trees. This fall the California Department of Agriculture made cuttings for indexing from selected trees of 22 plum and prune, 5 almond, 5 apricot, and 1 Mahaleb cherry. Following two years' indexing it is planned to establish a registration and certification program for the remainder of these stone fruit varieties and rootstocks.

As previously indicated, the development of registered and certified cherry varieties and rootstocks has been accomplished by indexing on five indicator hosts. With the addition of other stone fruits into the program this indexing procedure is being enlarged to include Shiro plum, Peerless almond, and Tilton apricot, making a total of 8 hosts. In this manner, after all stone fruits have passed the indexing tests, it will be possible to maintain trees of all types of stone fruits within the same screenhouse if necessity should arise, since all will have equivalent indexing.

Prior to the time that the cherry program was started, grape growers began to complain of the degeneration problems with grapevines. Already Pierce's Disease had been recognized, and more was becoming known of the White Emperor disease, Fanleaf, Yellow Mosaic, and Yellow-vein. In July of 1951, Dr. H. P. Olmo made a report to the Technical Advisory Committee of the Wine Institute outlining a proposed program for the introduction, improvement, and certification of healthy grape varieties. This gave growers an idea of a way to overcome some of their very serious vineyard troubles. In July, 1952, through the combined efforts of the Wine Advisory Board and the University of California, The California Grape Certification Association (a non-profit corporation) was formed. This association was an organization composed of industry and the University of California, particularly the departments of Viticulture and Enology and Plant Pathology. Under the guidance of Dr. W. B. Hewitt of the Department of Plant Pathology work was begun in the spring of 1953 to index the commercially important

table, raisin, and wine varieties. A year or so later assistance was obtained from the California Department of Agriculture and the United States Department of Agriculture. At the same time personnel of the various State and Federal agencies worked closely together to formulate and establish regulations for the registration of grape vines. Nurserymen and interested growers assisted in the refining and adoption of these regulations in September, 1956. The known troublesome virus diseases at that time were Fanleaf, Yellow Mosaic, White Emperor, and Yellowvein. The indicator plants used were French Colombard, Thompson Seedless, Ribier, and Emperor. In the spring of 1956 a Foundation Vineyard was established at Davis. It consisted of 4 rootstocks, 7 table and raisin varieties, and 15 wine varieties. New planting sites on which to establish mother blocks and increase blocks for nurseries and growers were carefully examined by the State inspectors. Commercial plantings were started in the spring of 1956. The main isolation requirements were: 1) no grapevines had been grown on the land for at least 10 years; 2) certified plantings must be at least 150 feet from any noncertified grape planting; and 3) the land must not be subject to flooding or injury by herbicides. The vines that were grown in a foundation vineyard received two visual inspections annually. Every four years each vine in this vineyard had to be given a complete re-indexing. Nurserymen and growers participating in the program had the choice of establishing either a mother block or an increase block. A mother block received two visual inspections annually. An increase block received one visual inspection annually. No reindexing was necessary. Fees were established by the California Department of Agriculture to cover the inspection costs. About 15 nurseries and growers presently are participating in the Grape Registration and Certification Program.

In 1958 the University of California combined the cherry and grapevine programs into one organization called the Foundation Plant Materials Service. The cherry program has continued on to date as outlined. As more information has become known of the grape viruses, it has been necessary to modify the grape registration and certification program. The last change in regulations occurred in May, 1961. There are better indicator varieties than used previously. These are St. George, Mission, Carignane, and Baco 22-A. What was originally the foundation vineyard at the University has now become a mother block. A new foundation vineyard was established at Davis this Spring. The isolation distance from a noncertified grapevine has been reduced to 100 feet. To date there are 3 rootstocks, 8 table and raisin varieties, and 27 wine varieties in this new foundation vineyard. The distribution of registered grape material from this vineyard is expected to start in the spring of 1962 in very limited quantities. Each bundle of cuttings or rootings of registered grapestock will have attached to it an appropriate tag issued by the California Department of Agriculture. In addition the ends of the twine or wire used to tie the bundles are sealed with a yellow metal seal issued by the California Department of Agriculture.



Besides the established programs for cherries and grapes, and those which are underway for other stone fruits, a program for the maintenance and distribution of registered garlic is in the initial phase at Davis. At present such a program is maintained by industry in the northern part of the state. A small planting of garlic was made on Foundation Plant Materials Service premises this year. Another year's testing will be needed to determine if registered garlic can be grown here. The garlic program is one that certifies to the freedom from the stem and bulb nematode, Ditylenchus dipsaci. Virus diseases are not involved.

Information concerning the strawberry, citrus, and avocado certification programs may be obtained from the Bureau of Nursery Service, California Department of Agriculture, 1220 N Street, Sacramento 14, California.

MODERATOR SPRING: Thank you, Dr. Alley. Along with Dr. Alley's field, we have this morning to speak to us Mr. Walter Krause on the progress of production and distribution of certified nursery stock. Walter has been active in his field for over 20 years. He is a sales and field representative for Stribling's Nursery for the five southern counties of the San Joaquin Valley of California. His duties, in addition to this, are as Director of the research program for Stribling Nursery, which carries on research in plant breeding, variety selections, "bud-line" selections, indexing and virus control and also work in specialized propagation methods for the production of fruit trees and grape vines. I would like to call now on Walter Krause to cover his section.

The Commercial Nurserymen's View of Certification

Walter D. Kraus

Stribling's Nurseries, Inc.

Merced, California

It has been our privilege and opportunity to work very closely with Dr. Curtis Alley and his associates and the State Bureau of Plant Pathology in the establishment of Certified Increase Blocks of cherry varieties, grape varieties and rootstocks. We were inexperienced in how to convert and apply these new phases of science to a commercial and practical enterprise, integrating them into our production of nursery stock. The University of California, and the Bureau of Plant Pathology, and the Nursery Service, California State Department of Agriculture, have given their undivided support and assistance, for which we are very grateful.

Dr. Alley has informed us of the development and importance of registration and certification of plant material, and I would like to review with you what we are doing with this material, how we maintain such plants, and the inspection of these Increase Blocks and last of all, the very important point, the acceptance of such nursery stock by the commercial grower.