

## OTHER SUBJECTS

### Recent Improvements in Citrus Registration and Certification Programs in California

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Regulations affecting the control of citrus virus diseases in California were last reported in the Proceedings of the 4th Conference of IOCV (1). Improvements

in the registration and certification programs suggested by recent research have been implemented since those Proceedings were published.

#### REGULATION FOR REGISTRATION OF CITRUS SEED TREES

(Sections 3011-3011.3 in Title 3, California Administrative Code)

Reports of seed transmission of psorosis virus prompted the adoption of this new regulation, which became effective June 3, 1972 (2). This provides for identification and registration of citrus seed source trees after inspection and index testing. Seed trees are required to be of good vigor, free from apparent mutations or disorders which may obscure disease symptoms or otherwise make the tree undesirable as a seed source, and to have produced sufficient fruit to show that the tree is not off-type.

Inspection and testing procedures required for registration are as follows: (a) a selected seed tree and trees adjacent to it shall be given at least one visual inspection prior to registration. The selected seed tree shall be indexed on a suitable indicator host for psorosis; (b) additional inspections or tests other than provided in this section may be required if seasonal conditions or other factors tend to obscure symptoms or make adequate inspection impossible, or when virus infection is suspected, or when virus symptoms may be masked in a particular variety; (c) testing shall be made in the order in which applications are received and as indicator host trees may be obtained; (d) registration shall be for a period of six years from

June 30 in the year in which testing is commenced; (e) registration may be continuous provided application for inspection and testing is filed prior to the expiration date of registration; (f) registration may be refused or cancelled if: (1) the requirements of this article have not been met; (2) the seed tree is found to be virus-infected, except at the discretion of the Department, a tree determined to be or likely to be virus-infected with a virus other than psorosis may be registered when it is growing in an area where such virus is known to be prevalent and is not being subjected to eradication or control; (3) a seed tree is found to be within the range of possible root graft of another citrus tree found to be psorosis virus-infected; (4) for any reason the identity of a seed tree becomes uncertain or has not been properly maintained; (5) a registration number is misused or misrepresented.

The program is supported through fees collected from participating nurserymen, to cover costs of inspection, index testing, and registration services. Approximately 200 seed-source trees will be entered for registration the first year, and more than 1,000 trees will eventually be registered.

## CITRUS REGISTRATION AND CERTIFICATION

(Sections 3000-3003, in Title 3, California Administrative Code)

Regulations for this long-range program were amended to take advantage of current research findings and experience gained since the first regulation was adopted in 1962. Major changes are concerned with index testing requirements for foundation and mother-block trees. These improvements are developments of the Citrus Variety Improvement Program. Current index testing procedures are as follows: The scion parent of any tree planted in a foundation block shall have been tested for and not found to be infected with the viruses of citrange stunt, concave gum, exocortis, psorosis, tatterleaf, tristeza-seedling yellows, vein-enation, and yellow vein by short-term indexing on *Citrus excelsa*, Dweet tangor, Etrog citron, Kara or King mandarin, Mexican lime, sour orange, sweet orange, and Troyer citrange plants; moreover, it must be tested by an approved method for the stubborn disease pathogen and not found infected. The scion parent or the candidate tree must be indexed for cachexia-xyloporosis virus in Orlando tangelo and Parson's Special mandarin plants outdoors, and these indicator plants must remain free of cachexia symptoms for at least three years before the candidate tree may be registered. Only tristeza and exocortis testing shall be required if the scion parent of the candidate tree is a registered tree in a foundation block.

Following planting in a foundation block, a tree shall be indexed on Mexican lime for tristeza and vein-enation viruses and on suitable indicators for psorosis and exocortis viruses within the 12-month period before registration. Tristeza indexing shall be repeated each year budwood is taken from a registered tree. Each registered tree shall be re-indexed for exocortis virus every three years and for psorosis every six years. Each foundation-block tree shall receive

one or more visual inspections each year. The mature fruit of bearing trees also shall be inspected for horticultural trueness to variety.

Following planting in a mother block, continued index testing of registered trees is required. Each tree shall be indexed on Mexican lime and suitable indicator hosts for psorosis every six years and for exocortis every three years and within the 12-month period prior to registration. To further protect against the natural spread of tristeza, index testing on Mexican lime is required of a registered tree each year in which approval for cutting of budwood is requested. Additionally, each tree shall be given one visual inspection each year.

Mechanical transmission of exocortis virus as a contaminant on tools or hands is a hazard in the propagation of nursery stock (3). New provisions were included for the maintenance of certified plantings as follows: All pruning shears, saws or other implements shall be disinfected in an approved manner prior to any fruit picking or cutting of any tree in a mother block, or any clonal selection within an increase block or certified block; any plant found to be off-type, showing symptoms characteristic of stubborn disease, or virus-infected may be required to be removed immediately from any planting.

The finding of stubborn disease pathogen being spread naturally into nursery stock plantings prompted additional administrative requirements for the inspection in certified nursery rows. All nursery rows are now inspected closely, and trees not making normal growth are rogued. As an additional protective feature, tolerances were added as a condition of certification. Certification may be refused or cancelled for any plants in part or all of a planting if an accumulated percentage

of more than 0.5 per cent of the trees of the same variety on the same kind of rootstock are found virus-infected in a nursery increase block or more than 2 per cent virus-infected or stubborn-affected trees in a certified block. Either visual inspections or the results of indexing or both may be used as a basis for determining the number of infected trees. Since the propagation in nursery rows provides an additional opportunity for the detection of stubborn disease, which may have been undetected in a registered parent source, registered mother-block trees which are not used primarily to produce certified nursery stock may be refused further registration.

The number of registered trees in the University of California Lindcove foundation block totaled 137 as of June 30, 1971. There are at present four participants, with a total of 130 registered and 377 candidate trees in five mother blocks.

Varieties established as registered or

candidate trees include Clementine and Dancy tangerine, Eureka and Lisbon lemon, Kara and Satsuma mandarin, Marsh grapefruit, Minneola tangelo, navel orange (Carter, Frost, Washington nucellar, and Gillette), Orlando tangelo, Red-Blush grapefruit, and Valencia orange (Campbell, Cutter, and Frost nucellars).

Even though participation in this long-range registration program has decreased, the program moved ahead as more varieties were registered in mother-block plantings and additional increase blocks were entered in the program. After critical evaluation, a total of 52 mother-block trees was released for registration. Because of undesirable characteristics, 32 trees were removed.

Young citrus trees certified under the terms of this program will be required to be propagated on understocks derived from the registered seed-source trees when appropriate amounts of such seed become available and are distributed to propagators.

### REGISTRATION OF CITRUS TREES FOUND FREE FROM SYMPTOMS OF PSOROSIS

(Sections 3007-3010, in Title 3, California Administrative Code)

This program of registration is relatively unchanged from 1966. The test for exocortis was improved by using the Arizona 861 strain of Etrog citron in addition to the original 60-13 selection.

To avoid the mechanical transmission of exocortis, a disinfecting practice util-

izing a solution of household bleach (2:8) was initiated in 1969. Between the budding of each set of indicator host plants, budding knives are dipped in this solution and wiped dry.

There was a total of 1,138 registered trees in this program as of June 30, 1971.

### RESULTS AND DISCUSSION

Since adoption of improved indexing methods for exocortis, tristeza, vein-enation, and recognition of stubborn disease, the registration programs have resulted in reducing the incidence of virus diseases. California Plant Quarantine Regulations permit only budwood or young nursery stock propagated from registered trees or trees similarly tested and found free from tris-

teza to be moved into or used for propagation within Meyer lemon-free districts and other tristeza virus-control areas.

In the past four years, 2,138 orchard trees were tested under the terms of the psorosis registration program. Of those tested, 12 were found infected with psorosis, 181 with vein-enation, 310 with exocortis, and two with tristeza. One of the two tristeza-infected trees became in-

fectured by natural spread in an area where natural spread is rarely encountered, causing great loss to nurserymen using this as a propagating source. As a result, the requirement for annual indexing was incorporated in the long-range program for the registration and certification of citrus trees.

#### LITERATURE CITED

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