ORLANDO SAMPAIO PASSOS

Absence of Young-Leaf Symptoms of Psorosis in the State of Bahia, Brazil

YOUNG-LEAF SYMPTOMS of psorosis were first described by Fawcett (1) in 1933. Since then, such symptoms have been used for the identification and early diagnosis of the disease. Leaf symptoms of psorosis have been reported from various areas where citrus is grown (2, 3, 5, 6, 7, 8, 9). Psorosis-free mother trees are selected for the citrus budwood registration programs of Florida, California, and Texas in the United States and of the states of São Paulo and Rio in Brazil on the basis of the absence of young-leaf symptoms.

Considering the need for developing a budwood registration program in the state of Bahia, Brazil, the commonly used quick tests for bud-transmitted viruses were tried. Moreira's test for exocortis (4) was efficient under prevailing conditions, but psorosis-infected trees failed to show young-leaf symptoms. A series of experiments and observations was then carried out on adult psorosis-infected trees, using test varieties that commonly develop young-leaf symptoms in the state of São Paulo.

Materials and Methods

A survey was carried out in 23 citrus orchards of the regions of Cruz das Almas, São Gonçalo dos Campos, Muritaba, Sapeassu, Conceição de Almeida, Santo Antônio de Jesus, and Salvador, from September, 1961, to January, 1962, in which observations were made on Bahia and Pera orange trees [*Citrus sinensis* (L.) Osbeck] from a few months to 30 years old, especially for psorosis leaf symptoms.

In September, 1962, trees of Bahia sweet orange and Dancy tangerine (*C. reticulata* Blanco) showing scaly bark symptoms in an old orchard at the Instituto de Pesquisas e Experimentação Agropecuarias do Leste

in Cruz das Almas were severely pruned and well fertilized. In May, 1963, this experiment was repeated with trees of Bahia sweet orange at the Fazenda Chapadinha in the same town.

In September, 1962, budwood of psorosis-infected trees of the sweet orange variety do Ceu (Heaven orange) (*C. sinensis*) was introduced from the Limeira Citrus Experiment Station. This variety is known to show conspicuous psorosis leaf symptoms when infected with the virus. Buds were grafted on Caipira sweet orange rootstock (*C. sinensis*) to observe symptoms and on Rangpur lime (*C. limonia* Osbeck) rootstock for propagation. In May, 1963, new tests were carried out with the same variety, by suggestion and courtesy of Dr. Sylvio Moreira, who sent budwood of psorosis-infected trees from Limeira.

Results

Most of the trees of the orchards considered in the survey are of the Bahia variety and a small percentage of Pera orange. Ninety per cent of the trees more than 10 years old show typical psorosis symptoms on the trunk and branches. No leaf symptoms were found on any tree of any age or variety.

New flushes of pruned trees of Bahia orange and Dancy tangerine were carefully and repeatedly observed. No leaf symptoms have been found since the trees were pruned in September, 1962, and May, 1963.

Material of Heaven sweet orange from Limeira, collected from trees showing conspicuous leaf symptoms of psorosis, failed to reproduce the symptoms when grafted on Caipira sweet orange and on Rangpur lime at the Instituto de Pesquisas e Experimentação Agropecuarias do Leste.

Conclusions

Young-leaf symptoms of psorosis seem not to occur in the regions of the state of Bahia considered in this paper. There are no records of their occurrence in other parts of the state. Sweet orange varieties cannot, therefore, be used as test plants for early detection of the virus in selected mother trees for the development of a budwood certification program. Further experiments will be carried out and other sweet orange varieties will be used for indexing.

The failure to produce leaf symptoms might be due to ecological prevailing conditions, especially temperature, which averages about 24.4°C for the entire year, with a minimum of 19.9°C and a maximum of about 28.5°C.

ACKNOWLEDGMENTS.—The author is indebted to Dr. Arlindo Vaz Sampaio Filho for his advice and revision of the manuscript, to Mr. Almir Pinto da Cunha Sobrinho for his valuable help on the experimental work, and to Dr. Victoria Rossetti for the English translation of the manuscript.

Literature Cited

1. FAWCETT, H. S. 1936. Citrus diseases and their control. McGraw-Hill Book Co., New York. 656 p.
2. FAWCETT, H. S., and KLOTZ, L. J. 1948. Diseases and their control, p. 495-596. *In* L. D. Batchelor and H. J. Webber [ed.], The Citrus Industry, Vol. 2. Univ. Calif. Press, Berkeley and Los Angeles.
3. KNORR, L. C., SUIT, R. F., and DUCHARME, E. P. 1957. Handbook of citrus diseases in Florida. Florida Agr. Exp. Sta. Bull. 587. 157 p.
4. MOREIRA, S. 1961. A quick field test for exocortis, p. 40-42. *In* W. C. Price [ed.], Proc. 2nd Conf. Intern. Organization Citrus Virol. Univ. Florida Press, Gainesville.
5. OLSON, E. O., and SLEETH, B. 1956. Virus diseases of citrus in Texas. Tex. Agr. Progr. 2 (2): 12-14.
6. PRICE, W. C., and KNORR, L. C. 1958. Psorosis, p. 78-81. *In* R. M. Pratt, Florida Guide to Citrus Insects, Diseases and Nutritional Disorders in Color. Florida Agricultural Experiment Station, Gainesville.
7. ROBBS, C. F. 1957. Doencas das Plantas Citricas, p. 11-36. Boletim do Campo, No. 100. Rio de Janeiro.
8. ROSSETTI, V. 1958. Doencas de Virus dos Citrus, p. 153-156. *In* H. W. S. Montenegro [ed.], Curso Avancado de Citricultura. Univ. São Paulo, E.S.A.L.Q., Piracicaba, São Paulo.
9. WALLACE, J. M. 1959. A half century of research on psorosis, p. 5-21. *In* J. M. Wallace [ed.], Citrus Virus Diseases. Univ. Calif. Div. Agr. Sci., Berkeley.