INTERNATIONAL ORGANIZATION OF CITRUS VIROLOGISTS

NEWSLETTER May, 2010

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From the Chairwoman

Núria Duran-Vila, Chairwoman

Núria Duran-Vila

Soon, we will be meeting in Brazil for the XVIIIth IOCV Conference and I am looking forward to it very much. As Marcos Machado has said many times, this conference will allow us to observe firsthand how the Brazilian citrus industry has been producing citrus under several disease challenges. As plant pathologists, we will have the opportunity to learn about these challenges and especially to see how to maintain alive a competitive industry in spite of huanglongbing, canker, leprosis, variegated chlorosis and many other diseases.

Since about a year ago, and following the request of the General Director of the Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), I accepted the responsibility of representing Spain in international committees dealing with agricultural research as well as serving as a scientific expert on the elaboration and evaluation of research programs at the European Commission. What started as a personal challenge became a full-time job and, on January 2010, I moved to Madrid where I took an INIA position as Coordinator of International Scientific Relations. As you all may know, Spain is not in a tremendously healthy economic situation. The worldwide economical crisis is hitting us hard and we are envisaging big changes in our administration system. Who knows where I shall end up next! However, IOCV is, and will always be, not only a reference in my professional career, but also the spot where I meet with friends, teachers and colleagues.

Being IOCV Chairwoman since 2007 has not been an easy task, as unforeseen events have occurred. As you will see below, the chairman elect, Mark Hilf, has recently resigned as chairman-elect as well as chairman for the period 2010-2013. During the next conference we will have to resolve this challeging situation that is not even considered in the IOCV by-laws.

In addition, the proceedings of the 17th IOCV conference (Adana, Turkey), for which Mark Hilf acted as the main editor, have not yet been published. I would like to thank John DaGraca

who agreed to complete the preparation of the proceedings and as you will see later in order to expedite the publication as soon as a manuscript is reviewed and accepted, it is made available on line on the IOCV website at www.ivia.es/iocv.

Fortunately, not everything looks dark! I am happy to inform you that, with Josy Bové and Juliano Ayres, we have been able to raise funds to help young scientists to attend our next IOCV Conference in Campinas. I trust that this will help increase and rejuvenate our membership for the continuous challenge of controlling and/or living with graft-transmissible diseases of citrus and keeping the citrus industry alive.

We hope to see all of you in Campinas. Have a nice trip to Brazil. It has been an honor for me to serve IOCV. Long live IOCV!

With warm regards, devotedly yours,
Nuria Duran-Vila
IOCV Chairwoman

IOCV

From Mark Hilf

To the membership of IOCV:

I regret that changes in my professional and personal life since I accepted the nomination of chairman-elect in 2007 have been such that remaining as chairman-elect and continuing as chairman for the 2010-2013 term would not be in my best interest nor in the best interest of IOCV.

IOCV has been an effective organization over the last 50 years in part because of the dedication of the individuals who accepted the responsibilities of chairman. I regret that at this time I cannot guarantee that I can provide the dedication to leadership that the members of IOCV deserve.

I feel confident that Chairwoman Duran-Vila and the IOCV Board will find a capable individual from amongst the current membership who would be a willing and capable successor to the current chairperson.

With warm regards,
Mark E. Hilf

XVII IOCV Proceedings Update

J. da Graca
The Board of Directors apologizes to all IOCV members and authors for the delay in the publication of the Proceedings if the 17th conference. I was asked to assist in completing the task, and I am pleased to report that good progress has been made.

Thanks to the efforts of Bob Milne, Pete Timmer and Mark Hilf, several papers were 95% ready when I began the task. Two groups of completed manuscripts have been sent to IVIA (28 papers), and they are now posted on the website www.ivia.es/iocv.

The remaining 10 papers are either being revised or edited, and should be ready for posting during May. In all there will be 38 papers (20 full and 18 short communications) and the abstracts of the remaining 58 presentations.

Thanks also to authors who have been very cooperative in returning corrected manuscripts.

XVIII Conference of the International Organization of Citrus Virologists

Second Announcement

Campinas and Cordeirópolis
São Paulo, Brazil
November 07-12, 2010

Online at:
http://www.iocv2010.net.br/

Marcos A. Machado
The XVIII Conference of the International Organization of Citrus Virologists will be held in Campinas, Sao Paulo, Brazil, from November 07 to 12, 2010.

Plenary and poster sessions will occur at the Royal Palm Plaza Hotel Resort in Campinas (www.royalpalm.com.br), and the field tours will include visits to orchards severely affected by huanglongbing, citrus variegated chlorosis, blight, and leprosis near to the Centro de Citricultura Sylvio

Moreira (www.centrodecitricultura.br), in Cordeirópolis.

The national organizing committee will prepare an exciting and interesting scientific program covering the "state of the art" in research on citrus graft-transmissible diseases, and field tours with visits to farms that are producing fruits under several challenges of diseases.

At the beginning of each plenary session a 30 minutes conference will be presented and will provide integrated, up-to-date scientific information on graft-transmissible diseases of citrus. The plenary sessions will be arranged in modules of 15 minutes followed by a break of 30 minutes. They will consist of invited presentations of 30 minutes, followed by oral presentations (10 min). Poster sessions are scheduled daily.

Important dates

July 10 to Sept. 10, 2010	Pre Registration
July 10 to Sept. 10, 2010	Abstract submission
Sept. 10 to Nov. 8, 2010	Registration
Nov. 7 to 12, 2010	Conference
Nov. 13, 2010	Pos Conference

Tentative Conference Program

Sunday, November 7 1 to 6 pm – Registration at The Royal Palm Plaza Hotel, in Campinas. 8 to 10 pm – Opening ceremony and welcome cocktail.	**Wednesday, November 10** 8 am to 6 pm – Field tour 7 to 10 pm – Social activity
Monday, November 8 8 am to 6 pm – Registration Oral session 1: 8 am to 6:30 pm Poster session 1: 7 to 8:30 pm	**Thursday, November 11** Oral session 3/4: 8 am to 6:30 pm 8 pm – Farewell dinner
Tuesday, November 9 8 am to 6 pm – Registration Oral session 2/3: 8 am to 6:30 pm Poster session 2: 7 to 8:30 pm	**Friday, November 12** Oral session 4/5: 8 am to 6:30 pm Closing ceremony

For detailed information please, visit

http://www.iocv2010.net.br/

M. Wallace-Memoirs

We in IOCV are very fortunate and thankful to have access to the personal writings and memoirs of Dr. J. M. Wallace through the kindness of his daughter Jane Wallace. In the previous IOCV newsletter Dr. Wallace led us through his early experiences at the Citrus Experiment Station and his close association with Dr. Howard S. Fawcett who talked him into accepting a job at the C.E.S. and later turned his research and experiments on psorosis over to him.

In part II "New surroundings" includes many exciting new events in our history of citrus diseases. Specifically, the early history of psorosis in California, which at that time was the most serious disease affecting citrus. In Part II Wallace leads us through the development of the first certification program ever in the history of citrus diseases which was based on field symptoms of psorosis. It also includes the ground breaking discovery of the seedling index which reduced the time for detection of psorosis from seven or more years to a matter of weeks. Working together with Dr. Fawcett in field transmission experiments, they proved the virus nature of psorosis, the first proven virus of citrus. This section also gives some of the history of the early staff at the Citrus Experiment Station. This is all remarkable history.

In the next issue of the IOCV newsletter we will give the early history of quick decline in California and its association with the tristeza epidemics in Argentina and Brazil. In a future article we will present, in Wallace's words, how the International Organization of Citrus Virologists (IOCV) materialized. We wish again to thank Jane Wallace for sharing this remarkable history with us on the founder of IOCV.

M. Wallace-Memoirs
Part 2. New Surroundings, New Associates, New Work

J. Wallace & C. Roistacher

When Dr. Fawcett returned from the Phytopathology meeting in Dallas he was accompanied by Dr. A. A. Bitancourt, head of the Plant Pathology Section of the Instituto Biologico, Sao Paulo, Brazil, who later became Director of that institution. Fawcett had spent several months at the above institute in 1937, and Bitancourt had obtained a Guggenheim Fellowship for study in California in 1942. During his six months stay in Riverside, he, Fawcett, and I spent many days in the citrus orchards, and I learned much from these two experts. After I established young citrus seedlings in the greenhouse for experimental use, Bitancourt and I began some studies on psorosis disease, and in the laboratory using Bitancourt's ingenuity, the three of us conducted experiments to show how gum forms in psorosis bark lesions, moves into and plugs the water conducting xylem vessels of the wood, thus causing parts of a tree above the lesions to deteriorate from lack of water.

After Bitancourt returned to Brazil, Fawcett continued to show me his experimental plantings at the Station where he had many experiments on psorosis as well as propagations and inoculations from abnormal trees he had encountered in citrus orchards. He explained all of this and gave me copies of his records. He also took me for visits to a number of large citrus estates where he and field managers had set up various experiments on psorosis. On one property in Orange County he and L.C. Cochran had been observing several hundred Valencia orange trees treated in various ways to determine if the activity of psorosis bark lesions could be stopped or reduced sufficiently to delay tree deterioration.

For many years various individuals, most of them interested only in making a "quick buck" had promoted magical cures for scaly bark on citrus trees. These treatments ranged from exposing bark lesions to sparking from electrodes of a machine pulled through the orchard to spraying trees and injecting soil with juice pressed from native cactus plants. Secret mixtures of tar, creosote, copper, lime, and other materials had also been put on the market, and many growers were gullible enough to invest money in these products. Promoters of these treatments were slick operators. They "guaranteed" they would cure the diseased trees, but by the time the growers could evaluate treatments, the salesmen could no longer be located. These schemes or rackets became so commonplace the State

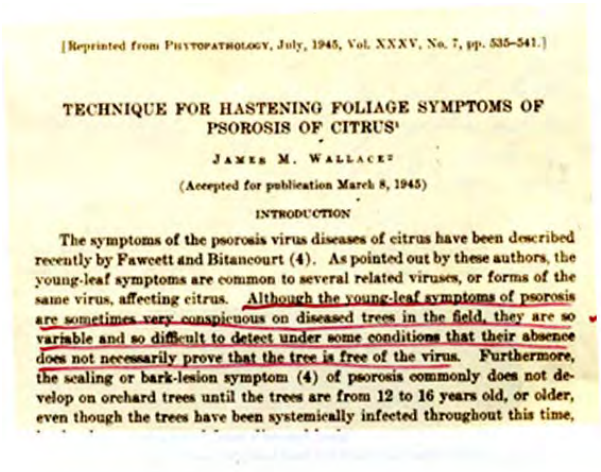
Department of Agriculture required licensing of such products, and a license was not issued until claim of beneficial effect had been substantiated by an experienced scientist from the University. For treatments claimed to cure psorosis, Dr. Fawcett was that experienced scientist, and he had spent a lot of his valuable time observing treated trees and evaluating their responses.

Fawcett's observations had led him to conclude that removal of the bark over and around a bark lesion by hand scraping had a beneficial effect. A few reliable, honest tree surgeons, and some not reliable, were using that treatment. Cooperating with one of the former, Fawcett had planned, and the commercial tree surgeon, Paul Sloop, had treated several hundred affected trees to learn the best method of scraping off the lesions and to study duration of the beneficial effects of treatment. Because hand scraping required much labor and time, Fawcett envisioned removal of the affected bark by a simple application of a chemical, and he had included some treatments of that kind. These trials had been established in a planting of 12-year-old Valencia trees where a high percentage of trees were showing bark lesions. More that 400 trees had been selected which were in approximately the same stage of disease. Groups of 10 or 20 trees were selected for each treatment with 40 trees receiving no treatment to serve as controls. When I began to study psorosis, all records of this experiment were turned over to me, and it became my responsibility to survey the trees once each year, counting new lesions and treating them, inspecting previously treated lesions, and re-treating if there was re-activity, comparing the general condition of all treated and control trees, and keeping yield records which were provided each year by the owner of the property. With one and sometimes two assistants I was able to make these annual records in about two weeks.

Hidden viruses found – 1949
Dr. J.M. Wallace is holding a trunk showing the bark scaling symptoms of psorosis. The picture was taken in 1949 for a Citrograph article which described his work the ground breaking discovery of the seedling index which reduced the time for detection of psorosis from seven or more years to a matter of weeks. Working together with Dr. Fawcett in field transmission experiments, they proved the virus nature of psorosis.

Some of the chemical treatments caused severe damage to the trees, but from one which showed promise, Dr. Fawcett developed a product which was later produced and marketed by Dow Chemical Company under the trade name DN 75, a weak solution of di-nitro-o-cyclo-hexyl-phenol in kerosene. When properly applied, this material killed the bark to within close proximity of the cambium, thus removing the same amount of bark as hand scraping. For some years DN 75 was used by growers for treating psorosis bark lesions, but as the old plantings went out of production there was no need for it. In plantings made after 1940 in California, psorosis was no longer a factor because other studies by Fawcett had shown there is no spread from tree to tree in orchards and that if psorosis-free budwood mother trees are used for nursery stock their progeny trees will remain free of psorosis. I can add here that the experimental scraping treatments described above continued for 12 years and demonstrated that removal of the bark lesions before they become advanced and re-treatment when necessary was decidedly beneficial in prolonging the life and productivity of diseased trees. However, by the time that evidence was obtained, the DN 75 chemical treatment had largely replaced hand scraping because of its simplicity and reduced cost.

With Fawcett's advice and direction, the Bureau of Nursery Service of the California Department of Agriculture initiated a program in 1938 to assist citrus nurserymen in selecting psorosis-free budwood sources. The discovery of the young-leaf symptom of psorosis made such a program possible. Prior to the discovery of that diagnostic symptom many vigorous, seemingly healthy trees often had been used as budwood sources with the result that years later the progeny grown from them would all develop bark symptoms. That happened because a tree can be infected for many years before bark lesion begins to appear. After Fawcett discovered the leaf symptom it was possible to inspect trees for the leaf effects, and if careful inspection during the growth flushes revealed none, chances were very good that these trees were healthy. However, as the program of inspection and certification of trees for registration progressed, the inspectors encountered problems with some trees on which they found an occasional leaf showing a veinal effect or flecking they could not diagnose with certainty. In other instances, trees were studied which showed no leaf symptoms during two inspections and then had what appeared to be psorosis symptoms on one or more leaves when it was examined again. When problems of that nature arose the inspectors brought material to me for study. It became obvious that there would be frequent occasions when a more reliable diagnostic test was needed. It occurred to me that much labor and travel by the inspector could be eliminated if a short-time indexing test for psorosis could be developed. Consequently, I began some inoculation tests of very small sweet orange seedlings under greenhouse conditions by grafting these with small twigs or buds from a known psorosis-infected source. It was learned that 8-10 inch seedlings receiving inocula from a psorosis source, if decapitated above the inoculum at the time of inoculation, developed new shoots and leaves rapidly and that the leaf symptoms appeared within 3 to 5 weeks. After that I made such tests for the inspectors whenever they had problems diagnosing the health of a tree under consideration for use as a budwood source. This inoculation technique also became useful in other studies I was making of psorosis and subsequently became a standard indexing procedure for psorosis and other virus diseases of citrus.



[Reprinted from PHYTOPATHOLOGY, July, 1945, Vol. XXXV, No. 7, pp. 535-541.]

TECHNIQUE FOR HASTENING FOLIAGE SYMPTOMS OF PSOROSIS OF CITRUS[1]

JAMES M. WALLACE[2]

(Accepted for publication March 8, 1945)

INTRODUCTION

The symptoms of the psorosis virus diseases of citrus have been described recently by Fawcett and Bitancourt (4). As pointed out by these authors, the young-leaf symptoms are common to several related viruses, or forms of the same virus, affecting citrus. Although the young-leaf symptoms of psorosis are sometimes very conspicuous on diseased trees in the field, they are so variable and so difficult to detect under some conditions that their absence does not necessarily prove that the tree is free of the virus. Furthermore, the scaling or bark-lesion symptom (4) of psorosis commonly does not develop on orchard trees until the trees are from 12 to 16 years old, or older, even though the trees have been systemically infected throughout this time,

Dr. J. M. Wallace published this classic paper which showed for the first time that a seedling index could detect a citrus virus. This shortened the time for detection of psorosis from up to 15 or more years to a matter of weeks. This classic paper was a most important contribution to rapid indexing. It is important to realize that most psorosis virus infection can be symptomless in sweet orange, mandarin, pummelo, grapefruit, tangelo or lemon.

Dr. Fawcett was enthusiastic over the short-time inoculation tests I had developed and other experiments I had initiated. We spent days in the field both locally and at distant points to study things of interest. I continued to learn and be inspired from him. Although he was by nature, a quiet, almost shy person, I treated him as if he were my age and joked with him when there was an occasion. I was to learn that he, his wife, and daughter were Quakers (Society of Friends) and that there was little levity around his home. Years after his death I described to his daughter some humorous events we had shared and was told that she had never known that side of her father. Respecting him as a scientist and as Departmental Chairman and knowing his strong religious beliefs, I think most of those associated with him were careful to treat him only with the greatest dignity. I, too, respected him, but by nature being one that has always felt life calls for a little humor and fun along the way I treated him the same as other friends and associates, and I am sure he enjoyed being brought down to my level rather than left always on a high pedestal.

Dr. Wallace then goes on to describe the early history of the Citrus Experiment Station at Riverside, California, some of the early staff as well as his anticipation to travel the world as a citrus pathologist. *Continues in page 13.*

AROUND THE WORLD

Argentina
Diagnostic Detection of Huanglongbing (HLB) from Psyllid (*Diaphorina citri*) samples

N. Costa

The Plant Protection and Biotechnology Laboratory of the Concordia Experiment Station of the National Institute of Agricultural Technology (INTA) is doing diagnostic detection of HLB caused by *Candidatus* Liberibacter asiaticus (Las) from Asian citrus psyllids (ACP) samples, by TaqMan quantitative PCR (qPCR) using 16s rDNA-based primers and probe. PCR testing is conducted on DNA extracted from ACP collected in several provinces of Argentina (Salta, Jujuy, Misiones, Corrientes and Entre Ríos).

The Asian citrus psyllid is present in Argentina since the 80's, but HLB has not been detected in citrus plants. Diagnostic detection by qPCR is recommended for countries with the presence of the insect vector but without the disease. The laboratory in Concordia belongs to the network of Reference Laboratories of the HLB National Prevention Program of the Ministry of Agriculture, Livestock and Fishery. The program involves plant protection related government agencies [INTA, National Animal Health and Agri-food Quality Service (SENASA), and National Seed Institute (INASE)], grower associations and universities.

Diagnostic detection in ACP has been made possible due to joint efforts between INTA and SENASA. The positive controls, psyllids infected with Las, which are necessary to ensure the reliability of the results, were sent in alcohol from Brazil and the United States.

Concordia Experiment Station offers citrus growers the diagnostic detection of HLB with qPCR in psyllids free of charge. The laboratory is analyzing psyllids collected by growers and SENASA personnel.

The analysis of psyllids in Argentina is a preventive measure. This is very important because international references show that the presence of Las can be detected 1.5 to 2 years before infected trees show HLB symptoms.

Italy

A. M. d'Onghia & K. Djelouah

CIHEAM-MAIB is organizing, on 26th of August in the framework of the 28th International Horticultural Congress (IHC) 2010 in Lisbon (Portugal), one-day

Seminar on:

"2010: the challenge of emerging fruit tree pests and pathogens in the Mediterranean free trade area'.

The organization of this seminar represents an unique opportunity for the Mediterranean research community to share knowledge on the main emerging pests/pathogens which may soon threat the fruit tree industry in the Mediterranean region; this threat could become very serious in view of the establishment of a free trade area of agricultural products in the Region.

More information on this event are available in the website www.ihc2010.org .

Since the first findings of CTV foci in Apulia region during the 2002, the CIHEAM/MAIB is actively involved in the strategy adopted by the Apulian region to control CTV, those by monitoring intensively CTV and it's vectors in the citrus groves and nurseries. CIHEAM/MAIB is also highly contributing to the improvement of the CTV control and spread among the Mediterranean countries through *training* of executives, *applied research* and *network* actions in the region thereby implementing international *cooperation* programs (Algeria, Tunisia, Egypt)

In the framework of the Ph D thesis conducted by D. Yahiaoui at the CIHEAM/MAIB and co-supervised by Prof A. Catara (University of Catania), a number of CTV isolates, originating from several Mediterranean countries, are characterized by Multiple Molecular Markers technique, using sets of primers encompassing similar size DNA fragments from four standard reference isolates (T30, T36, VT and T3).

Selected Mediterranean isolates are also subjected to experimental vector transmission trials using local aphid biotypes: *Aphis gossypii, A. spiraecola* and *Toxoptera aurantii.* Further analyses are also applied to evaluate the genomic variability of the virus after aphid passage.

Therefore, Raed Abou Kubaa from Syria supervised by G.P. Martelli, M. Saponari (University of Bari) and A.M D'Onghia (CIHEAM/MAIB), on the 22 of March discussed, his PH.D thesis at the University of Bari on "Characterization and genomic variability of citrus tristeza virus (CTV) isolates recovered in Apulia and Syria"

Florida
Citrus Black Spot Found in Florida

P. Timmer

In late March, 2010, citrus black spot (CBS), which is caused by *Guignardia citricarpa*, was found for the first time in Florida.

Fallen Valencia fruit due to severe black spot (Guignardia citricarpa) infection. Early abscission is common with severe infection.
This picture was taken in the grove with the initial infection discovery. The block was approx 20 year-old Valencia in the Immokalee area of Florida.
Taken on March 30 2010, by Megan Dewdney, Plant Pathology & Extension Specialist, Citrus Research and Education Center, Lake Alfred, Florida.

The Division of Plant Industry of the state agriculture department first identified the disease based on symptoms and later cultured the pathogen and identified it as *G. citricarpa* by morphology and PCR. The identification was confirmed by the University of Florida and the USDA. See the Compendium of Citrus Diseases for photos of the symptoms and information of the life cycle.

CBS appeared in a Valencia orange grove in southwest Florida near Immokalee in an area that is extensively planted to citrus. Symptoms were apparent on many trees scattered in several blocks of trees and in some cases, fruit symptoms were severe. It is unlikely that the disease originated in this grove and surveys are continuing to locate any other affected areas. CBS has been found in two other groves within 3 miles of the site and the inspections continue to a 7-mile radius. However, since the disease can only be detected readily on mature fruit, the time available for further detection this season is limited. All of the early and mid-season varieties have already been harvested and Valencia harvest is progressing rapidly.

CBS is currently found primarily in the southern hemisphere production areas such as Brazil, Argentina, South Africa and Australia as well as in Asia and the means of spread to Florida remains a mystery.

Severe hard spot, the diagnostic symptom of black spot on Valencia fruit. Taken by Michael Rogers, Entomology, Citrus Research and Education Center, Lake Alfred, Florida.

Since the disease is already present in a large area and has apparently been present for a time, it is unlikely that eradication will be attempted.

Currently, attempts are being made to promote decomposition of leaf litter to reduce inoculum and fungicide applications will be made to protect the new crop of fruit. It is likely that some restrictions will be placed on the movement of fruit in Florida as well as to other states and countries. In addition, measures will be taken to restrict movement of the pathogen in leaves and to protect nursery trees from infection. No formal rules have been implemented as yet to deal with the disease. Information on identification of the disease is being distributed to growers and packinghouses to assist in the location of other affected trees.

Fungicide programs have been developed in other citrus-producing areas to deal with CBS. Thus, the primary impact of the disease will be to increase production costs and reduce the ability of growers to ship fruit to various locations. After the serious impacts of HLB and citrus canker on the Florida industry, it appears growers will now have an additional problem to deal with.

For updated information, you can contact me (lwtimmer@ufl.edu) or Megan Dewdney (mmdewdney@ufl.edu) at CREC or Natalia Peres (nperes@ufl.edu) at GCREC, both with the University of Florida.

Memories of Morocco

C. Roistacher

In March of this year I was invited to attend the International Conference on Integrated Control in Citrus Fruit Crops (IOBC Citrus IPM) held in Agadir, Morocco. The invitation came through Prof. Ahmed Mazih and Dr. Mohamed Bouhida who, in the 1980s, had received his Masters degree under Dr. David Gumpf at UCR. This trip to Morocco brought back many wonderful memories of a time long ago during the 4th IOCV Post Conference trip in Morocco in 1966.

That incredible trip was organized by Josy Bove. At that time we toured many of the cities and experiment stations in Morocco and also visited Agadir and Tauradant in the south of the country. I hold dear the memories of so many people on that post conference trip when we were all so young. There was Lillian Fraser and Clair Calavan (see Fig. 1), Merrill Wallace, Josy Bove, Robert Vogel, Blondel, Ralph Schwartz, Lew Weathers, Steve Garnsey, Antonio Catara, Victoria Rossetti and so many IOCV members many of who are no longer with us.

Fig. 1. Clair and Georgie Calavan with Lillian Fraser inside a Moroccan tent during the 4th IOCV post conference trip to Morocco in 1966. Here in this tent we were served a typical Moroccan feast of a whole barbequed lamb with coos coos. This current trip to Morocco brought back many fine memories of so many of our IOCV people and events of that former trip.

In one of the cities of our visit we were treated to a dinner under a tent (as in Fig. 1) and we were again treated on this trip under a tent (see Fig. 2). The city of Agadir brought back memories of the destruction caused by an immense earthquake which leveled the city just a few years prior to our 1966 visit. The sight of that devastation is now a memorial and no new construction is a permitted over the graves and rubble.

Fig. 2. Enjoying a Moroccan lunch under a tent. This was reminiscent of our Moroccan dinner under a tent at the 4th IOCV post conference trip in 1966 (see Fig. 1).

The subject of my keynote lecture was to be on tristeza and the dangers inherent to the Mediterranean region should *Toxoptera citricida* enter Morocco or any of the citrus growing countries of the Mediterranean. However, in view of the current serious world situation with HLB I asked if I could change the topic to that of the impact of HLB and its danger to the Mediterranean region.

I wrote to a number of leading scientists asking them if they would send me their recent Power Point presentations on HLB and if I could use portions of a few of their slides to show the incredible destruction and potential of this disease. I was heartened by their responses and I am indebted to Silvio Lopes, K. Manjunath, R. Bassanezi, Wenbin Li, MaryLou Polek and Robert Krueger for their cooperation in the use of their excellent materials. My objective was to educate but also to scare. Thus, I was able to present two lectures, one on the dangers HLB and the other on tristeza. The conference was well attended (see Fig. 3).

Fig. 3. Roistacher giving his invited lectures on HLB and tristeza at the International Conference on Integrated Control of Citrus Fruit Crops in Agadir, Morocco on March 1, 2010.

Following the conference I spent a few days lecturing to the students at the Institute of Agriculture and Veterinary science and visited the excellent laboratories of the department of plant pathology. I also visited the outstanding Sapiama citrus nursery in Tauradant at the foot of the Atlas mountains. We also visited some groves in the Touradant region heavily infested with psorosis. It was a memorable return visit to Morocco for me enhanced by the memories of my past visit.

I was heartened to recently receive this letter from Dr. Bouhida:

March 12, 2010
Dear Chet, I am very happy to know that you arrived safely home. Apparently, your luggage likes to take turns before arriving at your destination. Once again, it was our pleasure to have you with us, and we spiritually and profoundly thank you for all your help in making the meeting worthy for all the attendees especially Moroccan citrus growers, engineers and technicians.

Let me assure you that the message was well received as we had calls from many people involved in the Moroccan citrus industry to thank us but more important to inquiry about the serious problem of HLB, CTV and the Brown citrus aphid.

Mohamed Bouhida

Antonio Catara who gave a paper on tristeza at this conference. Antonio joined me in memories and is one of the few who could remember and relate to that wonderful post conference trip of 1966. It was a joy to see him at this conference.

Update on California Citrus Research Board (CRB) operations program

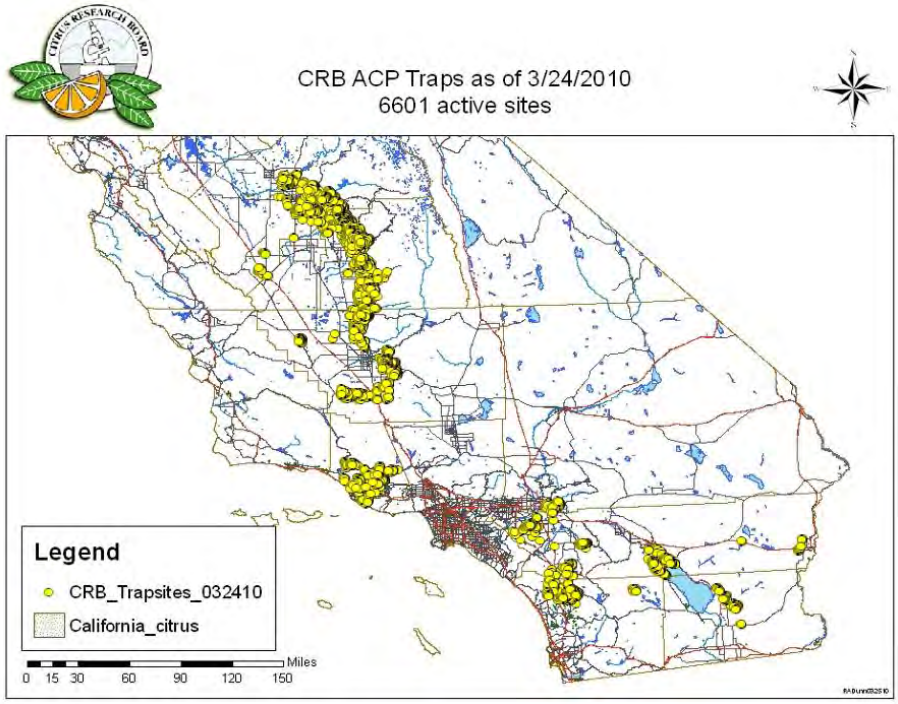
M. Polek

There is an active industry-wide effort to establish a management program for the ACP and Huanglongbing (HLB)-associated bacteria within California. Activities have been divided between the California Department of Food and Agriculture (CDFA) and County Agricultural Offices who are intensively surveying urban (residential) areas and nurseries and the California Citrus Research Board (CRB) that addresses commercial citrus only.

Currently the CRB has nearly 7,000 yellow panel sticky traps deployed from Monterey County south to the California/Mexico border. These traps are collected and replaced every 2 weeks. All data is collected using a hand- held computerized collection device that eliminates errors due to recording collection information by handwriting, eliminates the need for paper records, and vastly increases worker efficiency. To date, NO Asian citrus psyllids (ACP) have been detected on CRB traps.

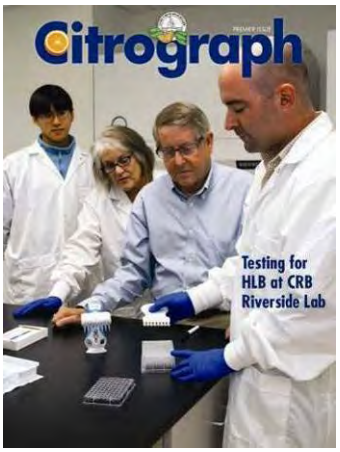
A diagnostic laboratory has been established in Riverside, California. It is staffed with a director, biologist, technician, and several student workers from nearby universities. It is intended to be a high through put facility and is equipped with 2 real time PCR machines. Personnel are responsible for examining the yellow panel traps for ACP, analyzing psyllids and plant material for HLB-associated bacteria. CDFA sends this laboratory their overflow samples so that material can be tested in a timely manner. Personnel are scheduled to attend USDA certification training in late April.

At this writing, NO sample has tested positive for HLB-associated bacteria. The CRB lab works cooperatively with the USDA, ARS laboratories in Riverside and Parlier and lab groups in Florida.



Focus of trapping in the main citricultural areas of the State in the South, Coast, and Central Valley.

The CRB is proud to announce the restoration of the magazine, *Citrograph*. The premiere issue was circulated in early February. The second issue will be available in late April. Six issues are planned for 2010. This magazine focuses on the California citrus industry and is used as a forum to report research progress on CRB-funded projects.



Cover page of the premiere issue of Citrograph, February 2010

Rational management of emerging Citrus greening/ HLB infections
An open item for discussion with IOCV-Part 2

M. Bar-Joseph

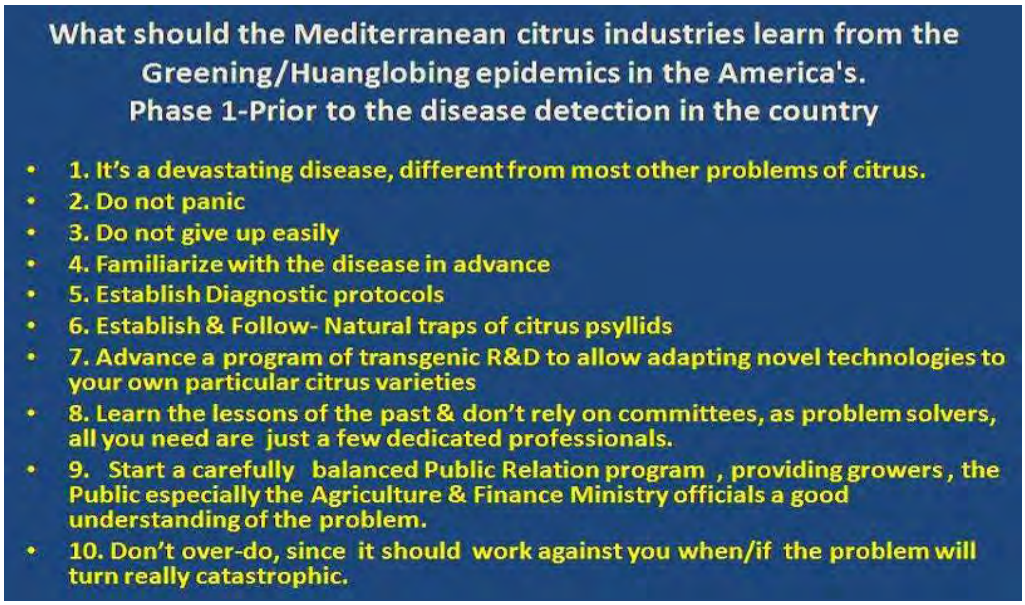
In continuation to our discussion stated in the previous IOCV newsletter, I have summarized in two slides a few core thoughts/ideas about the Huanglongbing epidemics and the reactions of the scientific community and the citrus industry.

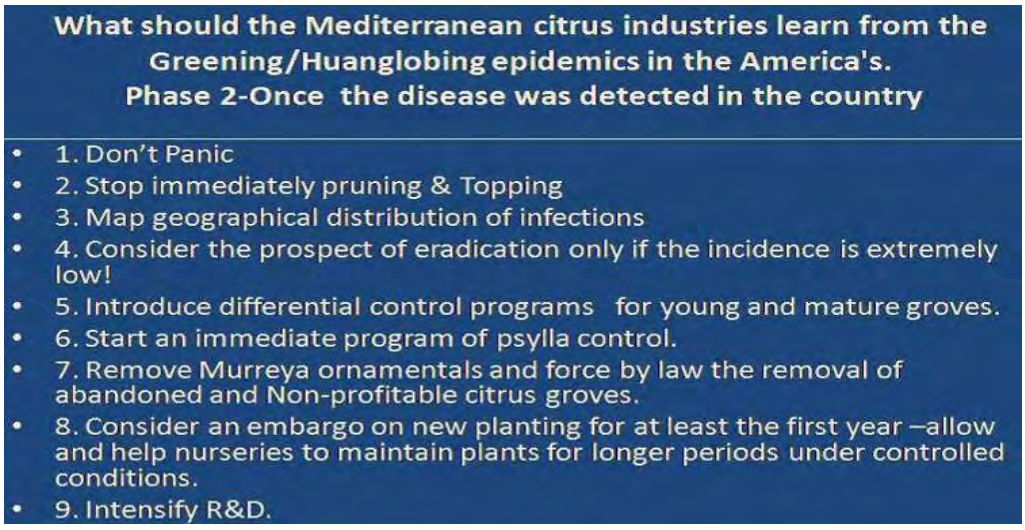
I will share these thoughts with audiences in Sicily and Cyprus and I would like very much to hear any comments from the IOCV members.

Please, send me your ideas, thoughts, and/or criticism at:

mbjoseph@gmail.com

Looking forward,
Moshe





M. Wallace-Memoirs
Part 2. New Surroundings, New Associates, New Work *continues*

J. Wallace & C. Roistacher

The official birth date of the Citrus Experiment Station was February 14, 1907 when the Regents of the University of California authorized the leasing of 30 acres of land at the eastern base of Mt. Rubidoux in Riverside and construction of one building and other facilities. Its purpose was to conduct research on citrus, walnuts, and other crops suitable for Southern California. By 1912, the expansion of these studies and increased staff of workers created a need for more space and facilities and a site for a new station was obtained at the foot of slopes of the Box Spring Mountains east of the city. Dr. H.J. Webber had been appointed Director of the Citrus Experiment Station, and he participated in selecting the site for the new station and in planning the buildings to be constructed. Formal dedication of the new institution was held on March 27, 1918. A large central building in mission style architecture with overhanging tiled roof and Spanish arched doorways faced the city of Riverside and looked down on about 250 acres of tillable land to be used for field experiments. A picturesque open arcade wound to what was known as the South Wing, in front of and just below the corner of the main building. A matching wing on the north side was completed in 1931, and a year later a separate building for Entomology with an insectary was ready for use. Also during those early years some greenhouses had been built as they were needed and when funds became available. By 1942 the land area had been increased to around 750 acres, and the staff consisted of nearly 200 academic (researchers) and 190 non-academic (laboratory assistants, field workers, secretarial, maintenance, et cetera).

Dr. J. M. Wallace

In 1942, when I joined the staff, the main building housed the staff of the Department of Horticulture, the Station library, business offices, the Director's office, most of the Station secretaries, one or two small conference rooms, and a small auditorium or seminar room. The Entomology and Biological Control Departments were then in their separate building, the Department of Soil Chemistry in the North Wing, and Plant Physiology and Plant Pathology were crowded in the South Wing. Because of the shortage of space some of the plant pathologists including myself were located in greenhouses, basements, or wherever office and laboratory spaces were available. Already there were plans for a new building for Plant Pathology and expansion of other facilities, but with the nation then at war there was little hope that these would be forthcoming in the near future.

Dr. Webber had been succeeded by Dr. L.D. Batchelor when he retired as Director in 1929, then past 80 years of age. He was at the Station daily, editing the two volume works, The Citrus Industry, which was to become the citriculturists' bible when it was published. I had numerous visits with this "grand old man" of citriculture who, with Dr. Walter T. Swingle had established in 1892 a field laboratory at Eustis, Florida, for the U.S. Department of Agriculture primarily for study of citrus diseases. Swingle had remained with the Department of Agriculture through his career as a plant explorer with a special interest in citrus botany. He had traveled to many places in the world collecting, identifying, and classifying citrus and citrus relatives and had become one of the two leading citrus taxonomists in the world. It was my good fortune to get to know him well on the occasion of his visits to consult with Webber on an extensive chapter he was writing for the forthcoming volumes of The Citrus Industry. As a novice in citriculture in my first years at the Citrus

Experiment Station it was a privilege for me to know and learn from both these authorities.

In Plant Pathology the staff members and their special interests were: H.S. Fawcett, general citrus pathology; L.J Klotz, gummosis and other diseases; Donald Bliss, diseases of dates; W.T. Horne, avocado diseases; C.O. Smith, crown gall of fruit trees and ornamentals; J.T. Middleton, a recent appointee to study vegetable diseases; and L.C. Cochran (U.S.D.A.) virus diseases of peach and other drupaceous fruits. Additionally there were three or four non-academic laboratory assistants, most important of who was Louis Huillier, a Belgian by birth who had found his way to California and a job as an assistant to Dr. Fawcett. With Fawcett's preference for research over office administration, Huillier had built his position into what was the equivalent of Vice-Chairman. He prepared budgets, made purchases, stocked and dispensed chemicals and other supplies to the staff, kept records of expenditures of each staff member, and had much to do with the hiring, supervising, and "firing" of greenhouse foreman and the person or persons responsible for operating the preparation room. I found him to be efficient, accommodating, and cooperative, and the two of us remained on good terms. On the other hand, there were occasions when he was offended by actions of staff members, for example, sloppiness in the laboratories, improper care of equipment, and not consulting him before making purchases charged to the departmental budget.

When Professor Horne and C.O. Smith retired early in the 1940's, G.A. Zentmeyer was hired to take over the studies on avocado diseases and E.C. Calavan came to the department to work on a long-standing problem decline of lemon trees. Except for some additional laboratory assistants, the plant pathology staff remained at the same level until after 1950. When I began to work there I had no laboratory assistant, and except for part-time help from Robert Drake who was in charge of the greenhouses, I had to grow and transplant citrus seedlings needed in my work. When Bob Drake left for the military service, a young woman Junior College graduate took over the greenhouse management, and a second young woman was hired later to assist me and other staff members who had lost their laboratory helpers to military service.

The Citrus Experiment Station was also the Graduate School of Tropical Agriculture although class instruction was always of a limited nature. Graduate students from Berkeley, Davis, and Los Angeles campuses sometimes came to Riverside to complete thesis research, and in the 1920's summer short-courses were held for undergraduate students and interested citrus growers. When a College of Agriculture was established at UCLA in 1933, class instruction and research emphasized subtropical and ornamental crops. The original faculty of two eventually increased to five plant pathologists for teaching and research, primarily on diseases of trees, shrubs, and flowers grown by nurseries and the cut-flower industry. The plant pathology operations at UCLA were budgeted under the Department at Riverside, but Dr. Fawcett served largely as a titular head of that sub-department, leaving most of the administration to an acting chairman and the individual staff members.

For me, the move to a different institution to work in a new field proved an easy transition. From the standpoint of research opportunities, I realized that I was in a fortunate position. Before me to be investigated was an almost totally unexplored field of citrus virus diseases, and I was almost entirely free to chart the directions I wished to take. In my boyhood fantasies of citrus and the lands where it grew I did not know there was so much romance associated with those golden oranges of Christmas which originated in such faraway places as China and India and then, with Man's help, traveled to many corners of the earth to bring pleasure and nourishment to millions of people. It was exciting for me to learn something of the history of citrus and the many forms of it which had come into existence and been preserved during its evolution. It was interesting to learn of the commercial development of citrus and to become informed on citricultural matters in general. Beginning a career of research in this field I devoted time to learning where other than California citrus problems were being investigated scientifically and to establish contact with some of the investigators.

From its beginning the citrus industry in California had faced many problems, some of which had threatened its future. To the best of their ability University scientists studied and solved some disease and insect plagues and provided needed information for the improvement of citrus culture.

However, the establishment of the University of California Citrus Experiment Station in Riverside in 1907 with its staff of specialists provided for the first time a research center where, hopefully, a solution could be found for all problems that arose. After this institution began to function there were several occasions when its research scientists virtually rescued the citrus industry by finding ways to control serious orchard diseases, combat threatening insect infestations, reduce fruit losses during storage and transit, and restore and maintain tree vigor and production by improved orchard management practices. For these researchers it was a constant battle because as more plantings were made of different kinds of citrus and new combinations of scion and rootstock varieties tried under varying soil and climatic conditions, new problems arose with regularity.

For many years the Citrus Station at Riverside not only served California but provided information and "know how" for citrus growers throughout the world. It is not exaggerating to state that this Station became the citrus Mecca for research scientists, growers, nurserymen, and others who came to study various phrases of citriculture and has remained that throughout its existence. Subsequent to its founding, the University of Florida expanded citrus research and established a well-staffed station at Lake Alfred, Florida, and as citrus production increased in Texas and Arizona; specialists began to research citrus problems in those states.

Development of a citrus industry in South Africa somewhat paralleled that in California, but research on citrus problems was largely by individuals in different universities or institutions scattered over the country or by specialists working for the large citrus estates. Japan, China, India, Italy, and Palestine (Israel) grew citrus long before it became an important crop in California, and some research had been conducted in those countries, the scope and quality of investigations depending on the training and ability of investigators. After World War I, Argentina and Brazil planted large acreages of citrus, and after some years were exporting citrus fruits to Europe. With that expansion of their citrus industries, agricultural experiment stations in those countries began to study various phases of citriculture.

Following the creation of the Citrus Experiment Station in California, and especially after the College of Agriculture was established at UCLA, there were increasing numbers of foreign students coming to the University for study in citriculture and many scientists, citrus growers, packing house operators, and others visiting the Citrus Experiment Station for varying periods of study and observation. It was largely these individuals who, after returning to their homelands, were responsible for conducting and encouraging expansion of citrus research in their respective countries.

Plant pathologist leaves today – 1954
This photo was taken in 1954 when Dr. Wallace left for his first of many trips abroad. It was during this first trip that the concept of an international organization for the study of citrus viruses was born.

During the first quarter of this century some U.S.D.A. plant explorers had traveled to far away places, but few American citriculturists had visited foreign countries. A visit by Dr. H.J. Webber to South Africa (1924-1925), few explorations by entomologists in search of beneficial insect parasites or predators, and Fawcett's studies on Mediterranean countries (1929-1930) and South America (1937) comprised the foreign travel of Citrus Station personnel prior to 1938. As I read reports of Webber and Fawcett and sometimes heard directly of their experiences, I had only passing hopes that I, too, might travel sometime to distant lands. Certainly I had no way of knowing that in the years ahead I would see foreign travel by U.S. scientists become commonplace and that I would have an

opportunity to visit most citrus growing countries as well as many others. Neither did I know that those travel opportunities were to come largely from the role I was soon to play as a research plant virologist in studies of a devastating disease of citrus which was soon to make its appearance in the orchards of California.

CONFERENCES / MEETINGS / PUBLICATIONS / ANNOUNCEMENTS

Joint HLB/ZC Conference Held in Texas

M. Skaria, M. Setamou & J. DaGraca
The new McAllen Convention Center in McAllen, Texas, was the venue for agricultural scientists, regulators, and industry personnel from eight countries and 15 U.S states, November 16-18, 2009.

A total of 277 participants, of which 65 were foreign nationals, participated in exchanging new information on the research and development of citrus huanglongbing (HLB) and potato zebra chip (ZC) diseases. These two economically important diseases are caused by different types of a bacterial pathogen called 'Candidatus' Liberibacter, and both transmitted by specific psyllid vectors.

Ray Prewett, President of the Texas Citrus Mutual, Dr John da Graça, Director of the Texas A&M University-Kingsville Citrus Center, and Dr. Gerhard Bester, Research Manager of Frito- Lay, Inc. Plano, TX played the leadership roles in organizing the event. Drs Ed Civerolo and Tim Gottwald of USDA-ARS, and Dennis Gross and James Supak of Texas A&M AgriLife Research also served on the Conference Steering Committee. Dr. George Bruening of the University of California gave a keynote speech in which he brought a lot of optimism through his talk, "Pierce's Disease and HLB: Taking the poorly characterized to the manageable".

In addition to the scientific data exchange among researchers, and meetings with decision makers in government agencies, there was a meeting of representatives from the United States, Mexico and Belize. The tri-national group is in the final stages of developing a joint citrus disease plan for all three countries. More in formation on this subject can be found at

http://agnews.tamu.edu/showstory.php?id=1572

Interested people can access copies of technical presentations of both HLB and ZC from

https://www.fritolayag.com/index.asp

One of the foreign attendees was Moshe Bar-Joseph, who spent some time afterwards visiting the Citrus Center in Weslaco.

Dr Bar-Joseph (left) visiting with John da Graca, Mani Skaria, Justin Tanner (graduate student) and Madhu Kunta (research associate).

National Clean Plant Network (NCPN) Citrus Clean Plant Network Formed

R. Krueger & G. Vidalakis
In 2005, three Agencies of the United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Agricultural Research Service (ARS), and Cooperative State Research, Economic, and Educational Service (CSREES), came to an understanding to support a national network to support the use of clean propagative materials.

This network, designated that National Clean Plant Network (NCPN), came into being in 2008 with this mission statement: "The NCPN provides high quality asexually propagated plant material free of targeted plant pathogens and pests that cause economic loss to protect the environment and ensure the global competitiveness of specialty crop producers".

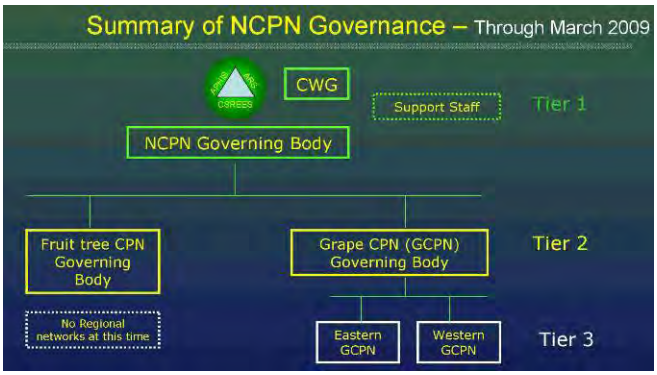
Specific goals were to establish the interaction among industry, research and regulatory communities to determine the resources and structure needed to ensure a viable and fully functioning clean plant program; provide rapid and safe introduction and release of selections from foreign and domestic sources for commercial development; provide foundation source to industry within prescribed state and federal certification schemes; establish diagnostic guidelines and national standards for different crop species for certification and maintenance; investigate, determine and implement the most appropriate methods for effective and rapid elimination of pathogens and insect pests from specialty crops for planting; develop best management practices that will be used by industry to maintain the pathogen- and pest-indexed status of plants for planting; develop a plan to evaluate the performance of the programs; and encourage, develop and engage all possible extension, education and outreach resources that will interact with and train key stakeholders, such as commercial nurseries and growers who propagate their own material to ensure the successful dissemination and use of NCPN products and services.

The NCPN consists of one Core Working Group (CWG) and three Tiers.
Tier 1 is the NCPN Governing Body. This body is responsible for all crops participating the NCPN.

Tier 2 are national level, crop-specific networks, which have their own governing bodies.

Tier 3 are state- or regional-level networks.

Initially (2008), fruit tree and grape clean plant networks were established. The National Fruit Tree Clean Plant Network (FTCPN) is organized only at the Tier 2 level, whereas the National Grape Clean Plant Network (GCPN) is organized both at the Tier 2 level and the Tier 3 level. The NGCPN Tier 3 organization consists of the Western Grape Clean Plant Network and the Eastern Grape Clean Plant Network. The driving force behind the initial organization of the GCPN was the Foundation Plant Services (FPS) unit at UC Davis, headed by Dr. Deborah Golino (a graduate student of the late Prof. David Gumpf, well-known to many IOCV members). The driving force behind the initial organization of the FTCPN was the NRSP-5 project in Prosser, Washington, headed by Dr. Kenneth Eastwell.



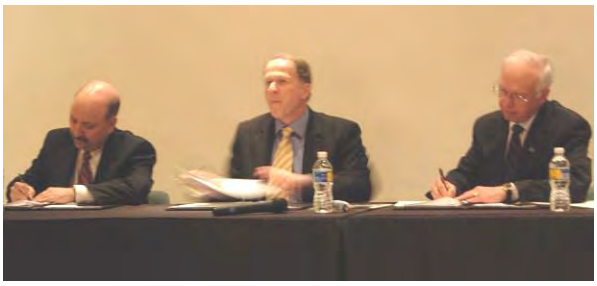
National Clean Plant Network (NCPN) structure as of March, 2009
Today, Citrus, Berries, and Hops are part of the network.

In April of 2007, Dr. D. Golino requested from Georgios Vidalakis to prepare a short presentation for the clean citrus centers of the United States of America for the upcoming NCPN workshop (May, 2007, Riverdale, Maryland). There, the citrus was first discussed as a future member of the NCPN.

In September of 2008, Georgios Vidalakis invited Murali Bandla of the NCPN Core Working Group and Erich Rudyj NCPN Coordinator to visit California. Their visit took place in February of 2009 and included the Campus of the University of California, Riverside (UCR), where they met with UCR officials, the National Clonal Germplasm Repository for Citrus and Dates (NCGRCD) in Riverside, where they met with Richard Lee and Robert Krueger, and the Citrus Clonal Protection Program (CCPP) Quarantine and Foundation Blocks Facilities in Riverside and San Joaquin Valley where they met with citrus scientists and industry representatives.

In response to the California visit the NCPN invited Georgios Vidalakis, Richard Lee, and Wayne Dixon, as representatives of the USA citrus clean centers, to

make presentations in the first NCPN annual meeting in Washington DC, in March of 2009. This was a very important meeting since the Memorandum of Understanding among the three USDA agencies (CSREES, ARS, and APHIS) involved in the NCPN was signed.



Meryl Broussard (CSREES), Dr. Ed Knipling (ARS), and Kevin Shea (APHIS) sign the Memorandum of Understanding on March 26, 2009 in Washington DC. Photo. G. Vidalakis

In July of 2009, planning for a National Citrus Clean Plant Network (CCPN) began officially at a meeting at the Citrus Research and Education Center in Lake Alfred, Florida. Among other participants from government, academia, and industry were IOCV members Georgios Vidalakis, Richard Lee, John da Graça, Peggy Sieburth, and Robert Krueger. After discussion, a draft charter was developed.

The CCPN charter was finalized and adopted in a meeting in Dallas, Texas, in March 2010, and an initial Governing Body (GB) was established. The initial GB includes Drs. Vidalakis (chairman), Lee, Sieburth, and da Graça.

The CCPN starts somewhat ahead of the fruit tree and grape networks, as both California and Florida have strong existing programs. The CCPN is an opportunity to bring the "minor" citrus-producing states into tighter integration with the existing clean stock programs. Texas and Arizona already have at least some portions of clean stock programs in place, but the Gulf Coast states have very small, specialized citrus industries with little or no support for clean plant activities. It is hoped that the CCPN will help integrate all US citrus production into the exclusive use of clean stock materials.

More information is available from:
http://groups.ucanr.org/ncpn

and

http://www.aphis.usda.gov/plant_health/ncpn/index.shtml

The UC Davis portal is currently more informative and user-friendly and links to the APHIS site.

The 2009 annual NCPN meeting took place in the U.S. National Arboretum which at that time hosted a special exhibition of bonsai trees.
Yes, you are reading correctly, this miniature tree is 385 years old!!!
Photo. G. Vidalakis

North American Plant Protection Organization (NAPPO), Citrus Panel

R. Krueger

The NAPPO Citrus Panel met in Miami, Florida, January 16 - 18, 2010. NAPPO has the mission of harmonizing plant protection activities between the North American countries, primarily USA, Canada, and México. NAPPO activities are aimed at improving phytosanitary health, facilitating trade, and promoting scientific efforts supporting these objectives. The Citrus Panel has consisted of scientific, regulatory, and industry representatives from USA and México (Canada not being a citrus producing country). IOCV members Georgios

Vidalakis and Robert Krueger are scientific representatives for USA. In 2010, Belize, site of a recent first report of HLB, was also represented. The Citrus Panel was one of the most active NAPPO panels in 2009.

Meetings were held in Fort Lauderdale and Villahermosa, and an International Workshop on Quarantine Pests of Citrus was held in Villahermosa in July. The Citrus Panel also revised a norm and established norms for CTV testing, thermotherapy, and shoot-tip grafting. The meeting in Miami established the workplace for 2010 and reviewed the norm.

The members of the Citrus Panel of the North American Plant Protection Organization from Mexico, U.S.A., and Belize at their Miami, Florida meeting on March 2010. Photo R. Krueger

HLB meeting in Merida, Mexico

R. Krueger

The NAPPO Citrus Panel has organized an International Workshop on Huanglongbing and the Asian Citrus Psyllid to be held in Mérida July 19-23.

Speakers from China, South Africa, Brazil, México, USA and elsewhere will present information on HLB/ACP situations internationally as well as advances in research dealing with these problems. Cost of the Workshop is 2,500 Pesos Méxicanos. For more information, contact Pedro Robles

pedro.robles@senasica.gob.mx

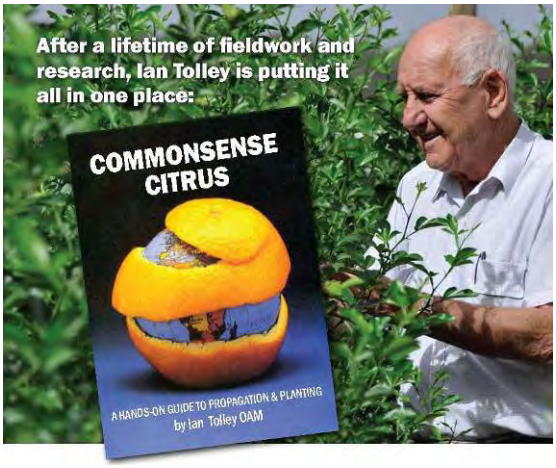
or see

http://www.senasica.gob.mx/?even=254

Commonsense Citrus

I. Tolley

In Ian Tolley's *Commonsense Citrus*, more than half a century's experience of citrus growing at all levels has been distilled into a practical book for both the professional nurseryman and the committed amateur.



www.commonsensecitrus.com.au

Filled with numerous explanatory photographs and drawings, this book will take the reader through planning, propagating and growing citrus trees to whatever scale outcome is desired, whether it's a modest backyard setup or a major commercial operation. Readers can draw upon Ian's vast experience around the world and in his family's highly successful Riverland nursery operation, all condensed into a substantial and easily understood full colour publication. The book was published in late 2009. To reserve your copy in advance, email

tolley@riverland.net.au

Pathogens Infecting Insects and Mites of Citrus

W. Wardowski, Florida Science Source
Pathogens Infecting Insects and Mites of Citrus is a pictorial guide to the entomopathogens of phytophagous insects and mites found on all plant parts of a citrus tree whether they are grown as a vast monoculture using contemporary high technological methods or as a few scattered trees grown on a hill side or in a homeowners backyard. It includes illustrations of healthy citrus insects and mites and their feeding injury.

Although emphasis is on Florida, citrus growers and other interested people will find the images helpful in identifying arthropods and their diseases. The purpose of this book is to present a comprehensive overview of the pathogens that cause disease of the various citrus arthropods, emphasizing: 1) visual recognition of a diseased host based on gross pathology, 2) identification via diagnostic characters of the pathogen, 3) visual recognition of healthy citrus pests and alternative ornamental hosts, and 4) direct injury to the plant and 4) direct injury to the plant.

The six authors are recognized worldwide as the leaders in this field. If you are an insect or mite with a pathogenic disease, you should go to one of these specialists for proper diagnosis of the problem.
Clayton W. McCoy, Professor Emeritus, University of Florida, Citrus Research and Education Center, 700 Experiment Station Road, Lake Alfred, Florida 33850.

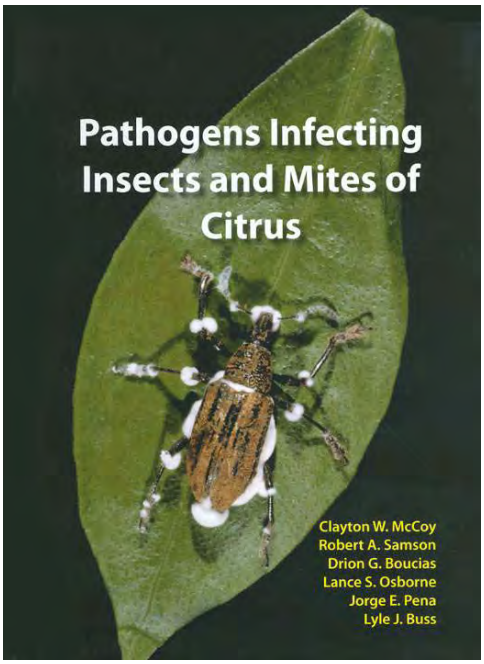
Drion G. Boucias, Professor of Entomology, University of Florida, P.O. Box 110620, Gainesville, Florida, 32611.

Robert A. Samson, Head of Applied and Industrial Mycology CBS Fungal Biodiversity Centre, P.O. Box 8516,3508 AD Utrecht, The Netherlands.

Lance S. Osborne, Professor of Entomology, University of Florida, Mid-Florida Research and Education Center, 2725 Binion Road, Apopka, Fl. 32703.

Jorge E. Pena, Professor of Entomology, University of Florida, Tropical Research and Education Center, 18905 SW 280 Street, Homestead, Fl. 33031.

Lyle J. Buss, Senior Biological Scientist, University of Florida, P.O. Box 110620, Gainesville, Florida, 32611.



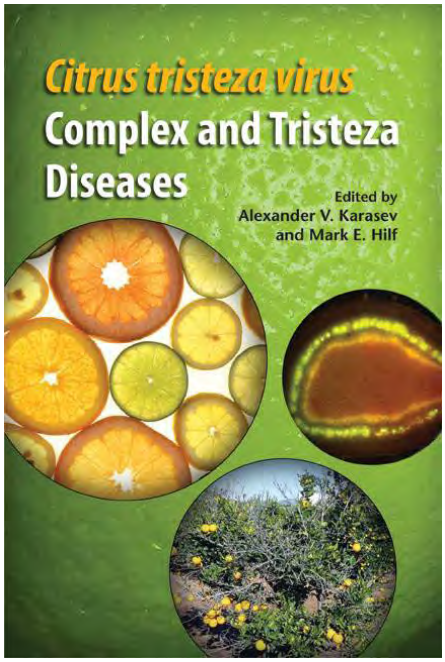
http://insectpathogens.com/
&
http://www.ultimatecitrus.com/fssource/index.html

Citrus tristeza virus Complex and Tristeza Diseases

American Phytopathological Society
More than 35 CTV experts (many IOCV members included) have authored a 15 chapter book entitled "Citrus tristeza virus Complex and Tristeza Diseases".

Citrus tristeza virus Complex and Tristeza Diseases is a comprehensive title on controlling and managing citrus tristeza virus (CTV), which causes complex disease syndromes in citrus. This book includes a description of the disease and its history as well as information about diseases caused by the virus and the management of the disease in different countries. This book will be of interest to plant pathologists, plant virologists, horticulturists, and graduate students in plant pathology and related sciences.

Contents
Section I: Disease Description
Section II: Molecular Biology of the Pathogen
Section III: Aphid Transmission and Epidemiology of Citrus tristeza virus
Section IV: Resistance to Citrus tristeza virus in Citrus spp.
Section V: Management of Citrus tristeza virus—A Worldwide Experience



From the preface:
Based on strictly economic criteria, Citrus tristeza virus (CTV) is often considered one of the most important plant viruses known to date. This alone makes it a prime candidate for a research program. Given the world-wide distribution of citrus, the high value of citrus crops, and the severe damage inflicted by the virus, it comes as no surprise that CTV has been studied by plant pathologists all over the world. However, in addition to these practical considerations, CTV is the largest and most complex virus among all known plant viruses. If one adds a genetically complex woody perennial citrus host to this interesting mix, it becomes clear that to solve the problem of managing CTV infections in various species of citrus grown in diverse environments all over the world, a comprehensive research ap-proach has to be applied.

For more information visit:
http://shopapspress.stores.yahoo.net/citrvicoandt.html

Obituaries

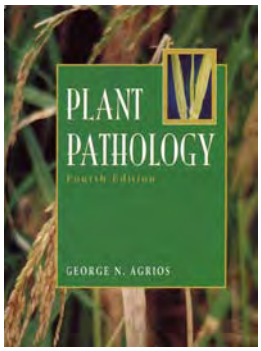
Dr. George N. Agrios
January 16, 1936- March 8, 2010

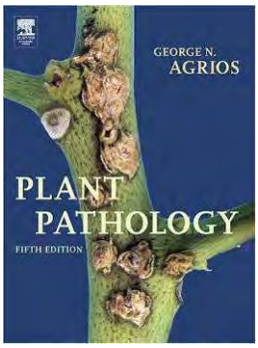
B. Zettler, From the University of Florida
Dr. George N. Agrios died March 8, 2010, due to complications of Parkinson's disease in Gainesville, FL. In 2002, after over 12 years of service, Dr. George N. Agrios stepped down from the chairmanship of our department. Dr. Agrios was born in Galarinos, Haldkidikis, Greece, and received his Ph.D. degree from Iowa State University in 1960 under the auspices of a Fulbright Travel Grant. After serving for 2 years in the Engineering Corps of the Greek Army as a demolition expert, he moved to the United States, where he assumed a faculty position at the University of Massachusetts at Amherst. His main duties there involved teaching several courses in plant pathology and conducting research on viruses of pepper, squash, corn, and pome fruits. In 1980, he proposed and spearheaded the creation of a biotechnology program at the University of Massachusetts and received a state wide "Award of Excellence" for his services. In 1988, he came to Florida.

Dr. Agrios was elected Fellow of the American Phytopathological Society in 1983 and assumed the highest administrative offices of the Society as Vice-President (1988-89), President Elect (1989-90), and President (1990-91). He also served as Secretary, Vice-President, and Chairman of both the Northeast Division of APS and the Technical Committee on Viruses and Virus-Like Diseases of Deciduous Fruit Trees and Vines.

Although Dr. Agrios has had an illustrative career as a researcher, classroom teacher, and administrator, none of his many achievements has had a greater global impact than his text, "Plant Pathology," which was first published in 1969 and, in 2005, appeared in its fifth edition. It is, without question, the most widely used plant pathology text in the world and has been for more than 30 years. The original English version has been translated into 11 languages, including Spanish, Arabic, Farsi, Chinese, Indonesian, and Korean, thus making this encyclopedic work readily available in the native tongues of 75 per cent of the world's population. It is impossible to know just how many plant scientists have used this book, but it is probably safe to say

that most plant pathologists alive today gained their first formal classroom exposure to plant pathology, directly or indirectly, from it.





Dr. Agrios has made other important contributions to spreading the word about plant pathology as well. As Editor-in-Chief of the APS Editorial Board, he conceived, organized, and implemented the APS Press, which continuously publishes and sells an extensive body of plant pathological literature. Today, and as a direct result of his efforts, more than 1.3 million dollars worth of books, periodicals, and various visual aids and computer software are now being published and made available to plant pathologists and growers annually throughout the world. In addition, shortly after coming to Florida, Dr. Agrios founded the Florida Phytopathological Society, which brings together over 100 plant pathologists working for IFAS in Gainesville and its Research and Education Centers, the Florida Department of Agriculture and Consumer Services, the USDA, and various industry groups.

The many contributions made by Dr. Agrios on behalf of our graduate and undergraduate students, faculty, and career service employees need no elaboration. What may be less apparent, however, are some of the innovative programs Dr. Agrios put into motion for our students. One such innovation was the work-study program for undergraduates, which provided them with hands-on experience in individual laboratories where they interacted with the other members of our department on a first-hand basis. Several of the students, who took advantage of this opportunity, eventually became graduate students here.

Also, recognizing the eclectic nature of our discipline, Dr. Agrios was instrumental in establishing two, now popular, lower division courses in plant pathology. These courses ("Molds, Mushrooms, Mildews, and Men" taught by Dr. J. W. Kimbrough and "Plants, Plagues, and People" taught by Dr. F. William Zettler) have increased in enrollment each semester and now together reach over 1,000 students annually. No other department of plant pathology in the US has such high enrollments in college courses at that level.

Perhaps the most innovative of all of Dr. Agrios' accomplishments at UF, however, is his creation of the University of Florida's multidisciplinary Doctor of Plant Medicine program, now headed by Dr. Robert J. McGovern.

Formalized in August 2000, it is approved as an official professional doctoral degree program, for which students earn 120 credits and graduate having an unprecedented background in plant health. Unlike conventional Ph.D. programs, Doctor of Plant Medicine students are not obliged to conduct research on a narrow, clearly restricted project within a specialized discipline, such as entomology, plant pathology, or weed science, etc. Instead, these students receive extensive instruction in a broad range of topics covering the gamut of all disciplines that deal with plant health. Thus, people who have the Doctor of Plant Medicine degree will have a broader educational base to solve plant production problems.

2006-Dr. Agrios presenting the "Agrios Award" to a graduate of the Plant Medicine program of the University of Florida. http://dpm.ifas.ufl.edu/dpmso/DPMAA.shtml

In retrospect, the concept of a "general practitioner" for plants seems only logical. But it was Dr. Agrios, with help Drs. John L. Capinera (Entomology/Nematology) and Jerry M. Bennett (Agronomy), who first realized the potential value of this concept for the plant sciences and fought for its approval and, now, implementation.

In addition to his career as a plant pathologist, Dr. Agrios was an active member of Saint Elizabeth Greek Orthodox Church in Gainesville, where he served as parish council president and founded an adult education program. His wife, Annette; three sons, Nicholas, Anthony, and Alexander; two sisters, and four grandchildren survive him.

Jacques Cassin
1926 - 2009

J.M. Bové

Jacques Cassin graduated in 1948 from the French National School of Horticulture in Versailles, a well-know school in which other French colleagues, such as Louis Blondel and Robert Vogel, received their higher education. He spent the year 1950 in Algeria at the Boufarik citrus experiment station headed, precisely, by L. Blondel who introduced him to the world of citrus.

Jacques Cassin

In 1951, he entered the French Institute for Research on Fruits and Citrus (IRFA), which became later part of CIRAD, where he stayed until his retirement in 1986. For his first mission, he was sent by IRFA to the Kindia Research Center in Guinea to be in charge of citrus. Guinea becoming independent, he was moved in 1958 to Rabat, Morocco, at the Central Citrus Research Station, first as assistant to Henri Chapot, head of the IRFA Mission in Morocco, and later as head of the Mission himself. In the meantime, the San-Giuliano Citrus experiment Station in Corsica had been founded in 1958, headed by Louis Blondel since 1963, when Algeria became independent. Jacques Cassin joined the Station in 1965 in charge of Citrus horticulture, while Robert Vogel, at the station since 1959, was head of Citrus virology. The three of them greatly contributed to the fame of "San-Giuliano". In addition to taking care of citrus horticulture in Corsica, J. Cassin became soon head of the Citrus Department of IRFA, worldwide. He developed, until his retirement in 1986, citrus research and development not only in Corsica, but also in the many countries where IRFA/CIRAD was involved. As a horticulturist well aware of graft-transmissible diseases of citrus, he obtained several selections of nucellar citrus lines. In Corsica, he set up several large field-experiments on citrus nutrition, soil management, weed control, citrus pruning, etc. He became interested in the effect of climate on citrus and established an extensive citrus collection in many different locations: Benin, Cameroun, Corsica, Guadeloupe , Guyana, Ivory Coast, Martinique, Nigeria, Reunion, Senegal,…As many other horticulturists, he came to citrus virology through rootstock experiments. In Morocco, he detected citrus tristeza virus in several Satsuma trees and had them removed immediately. In Madagascar, in 1968, we discovered huanglongbing together…He was a faithful supporter of IOCV.

Jacques Cassin was an open-minded person, eager to discuss and defend his points of view. I enjoyed arguing with him. It was easy to get along well with him. I remember with pleasure the many good moments we spent together, late into the night, in Corsica or elsewhere around the world.

He is outlived by his dear wife, Jacqueline, and their daughter Anne.

So long, Jacques.

Hank Brokaw
March 23, 1927- February 17, 2010

D. Karp
Hank Brokaw, an important avocado and citrus nurseryman, died Wednesday, February 17 at his home in Santa Paula, Calif. He was 82.

He had suffered several strokes over the last two years and had been in declining health, said his daughter Elena.

Hank Brokaw

Although he was best known for establishing what became California's leading avocado nursery, he also played an important role in the citrus industry in Ventura County, as a nurseryman, grower, and collaborator with university researchers.

"Hank was one of the few citrus nurserymen, including Albert Newcomb, who thought beyond the interests of his own nursery and the profits he could make, for the benefit of the citrus industry in the entire state of California, and worldwide," said Chester Roistacher. In the 1970s, when then-Governor Ronald Reagan cut the University of California's budget, threatening the existence of the Citrus Clonal Protection Program, Brokaw's support was critical in persuading the industry to approve a box tax that continued support for the program, he added.

Brokaw was a progressive force in many ways. He worked with UC-Riverside citrus breeders Mikeal Roose and Tim Williams on test plantings of many of the new mandarin varieties released in recent decades, including the Temple-Dancy-Encore hybrids, Gold Nugget and Tango. "His continued collaboration over many years, which we didn't always have with other people, allowed us to evaluate a range of different varieties," said Dr. Roose. "His assistance was particularly vital with Gold Nugget, in establishing the best cultural practices to improve fruit quality."

Tracy Kahn, curator of the UC-Riverside Citrus Variety Collection, added that Brokaw provides invaluable assistance in an evaluation of late-season navel oranges over six years starting in 1997.

"He didn't directly discover or patent any varieties, but he did work with quite a few protected varieties," said his son Rob Brokaw, manager of Saticoy-based Brokaw Nursery. "For example, with 'Beck Early' and 'Chislett Summer' navel oranges, he forged relationships with the discoverers, and worked with them to patent their varieties and to distribute them."

Larry Rose, sales manager of Brokaw Nursery, recalls that Hank and Albert Newcomb were trying to get a citrus certification program off the ground as early as the 1960's, and tried to standardize color codes for nursery scions and rootstock. He was one of the first nurserymen in California to grow citrus trees in liners rather than bare root; "many customers were skeptical at first, but when they saw how well the trees grew compared to conventional practices, they quickly gave up their complaints," said Rose.

Brokaw was also an active member in many professional organizations, including the California Citrus Nursery Society, the International Society of Citrus Nurserymen, and the International Plant Propagators Society. "With his age and experience, he provide a long-term perspective for them in many ways," said Dr. Roose.

His main claim to fame, however, was avocados. Since the early years of the California avocado industry in the 1920s, the most serious problem confronting growers was a fungal disease later identified as *Phytophthora cinnamomi*, commonly known as avocado root rot. By the 1950s, George Zentmyer, professor of plant pathology at the University of California at Riverside, discovered a few individual seedlings that were tolerant to this disease and thus suited for use as rootstock, the bottom part of the tree on which the fruiting cultivar, such as Hass or Fuerte, would be grafted.

It was difficult, however, to multiply these disease-resistant seedlings for consistent rootstock because

avocado seedlings did not grow true to type; all avocado groves at the time were grafted on seedling rootstock that varied considerably. University of California scientists, notably Edward Frolich, discovered a complex method, involving growing in the dark, to reproduce the disease-tolerant rootstock, but it was Brokaw who made this technique practical and commercialized it, starting in the 1970s.

In this method, a scion from the desired rootstock cultivar (such as Duke 7 or Toro Canyon) is grafted onto a nurse seed that provides a temporary root system. The young plant is placed is a dark chamber where its growth is elongated, and new shoots lack chlorophyll; most important, this technique of producing tissue in the dark, called etiolation, has a beneficial effect on root production. When the shoots achieve sufficient growth, the plant is removed from the dark chamber, treated with growth regulators to further enhance rooting, and a girdling ring, a design for which was patented by Hank Brokaw, is placed on the stem. Over the succeeding months, the girdling ring constricts the stem, enhancing the production of clonal roots on the stem above the ring, and choking out the nurse seed and its roots. About a week after the girdling ring is put on, a second graft of the fruiting variety is made at the top of the stem.

At first, this relatively expensive method was controversial among growers, but it prevailed by the late 1980s, and today about 90% of avocado nursery trees newly planted in orchards are grafted on clonal rootstock, said Brokaw's son Rob, who manages Brokaw Nursery in Saticoy, a small, unincorporated town in Ventura County. Were it not for Hank Brokaw's championing of this innovation, the state's avocado industry probably would be smaller and less profitable today, said Mary Lu Arpaia, a University of California avocado researcher.

William Henley Brokaw, known as Hank, was born March 23, 1927, in Whittier, to Robert Lee Brokaw, an oil field worker who also ran a small nursery, and Helen White Brokaw. Agriculture, and particularly avocado culture, ran deep in his family. In an article that appeared in the *California Avocado Society Yearbook* in 1998, Jack Shepherd, the publication's longtime editor, described this background: "Hank's interest in agriculture was not from some epiphany. His father had grown orchards and a nursery. His uncle was the early-days prominent Whittier avocado nurseryman, A. R. Rideout. A cousin was Harold H. Brokaw, the Whittier avocado nurseryman who was the principal promoter of the Hass variety in its early history. A relative by marriage was Vista's well-known avocado nurseryman Arthur G. Hazzard…"

After serving in the Navy, Brokaw attended Fullerton Junior College but earned a bachelor's degree in premedical studies at Harvard University and a master's degree in anthropology at the University of Chicago, where he met his future wife, Ellen McGiffert.

Seemingly seeking to avoid the family business, he worked for a number of years as a high school teacher, but somehow felt compelled to plant 500 avocado seeds as a hobby, which led in 1956 to the establishment of his own nursery. Brokaw sometimes enjoyed playing the unassuming farmer, but he was a shrewd businessman, and his nursery flourished, especially during the 1970s, when avocado plantings boomed. For many years, it has been by far the state's largest avocado nursery as well as the leading citrus nursery in Ventura County.

Brokaw also farmed 350 acres of his own groves, of citrus, avocados and a few exotic fruits such as cherimoyas and white sapotes. But he did not consider profit to be his overriding goal, and he always was looking out for the interests of other farmers. Brokaw served twice as president of the California Avocado Society, in 1973-74 and 1986-87. And despite his family's links to the Hass variety, he lamented the emergence of a virtual Hass monoculture, advocating the merits of other varieties such as Pinkerton and Reed.

"He was the pillar of the avocado industry," said Ben Faber, a Ventura County farm advisor.

In addition to his wife, his son Rob of Santa Paula and his daughter Elena Maria Brokaw of Ventura, he is survived by three other children, Debbie Jackson of Yachats, Ore.; Elisabeth Rossi of San Carlos, Calif.; and William Henley (known as Will) Brokaw Jr. of Watsonville, Calif., who sells fruit from family ranches at farmers markets in the San Francisco area; and nine grandchildren.

A memorial service was held March 6 in Ventura.

A shorter version of this article appeared in the Los Angeles Times *on February 20, 2010.*