INTERNATIONAL ORGANIZATION OF CITRUS VIROLOGISTS

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IOCV NEWSLETTER **May, 2007**

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FROM THE CHAIRMAN

The first item of good news is that the Proceedings of the 16th Conference have now been printed and have been mailed out to all those who were present at the conference in Mexico. There is also an order form for extra copies, so please encourage your colleagues and libraries to order. I have appointed a committee, as outlined in the by laws, to consider full papers in the proceedings for the Wallace Award, and for the newly created Gumpf Award. Jane Wallace, daughter of Adeline and J. M. Wallace, has made a generous offer to IOCV to mark the 50th anniversary – she has offered to donate $1,000 to add to the Wallace award fund.

Incidentally, our colleagues in the International Society of Citriculture have also been busy publishing the proceedings of their 2004 conference, and they should be ready soon.

Preparations for the 17th IOCV Conference in Turkey are now well under way, and we hope as many people as possible will be able to attend the meeting and the fascinating tours which Nuket Onelge and her colleagues have put together. If you know of any non members who may have an interest in the conference, please point them towards the website: http://iocv2007.cu.edu.tr. We have also advertised the meeting through the American Phytopathological Society webpage and newsletter. Many of us are able to attend IOCV meetings wherever they are held, but others can only get to them if they are nearby. So, if you know of any citrus pathologists in countries close to Turkey where citrus is grown but do not have active IOCV members (such as Lebanon, Syria, Bulgaria, Georgia, Azerbaijan, etc.), please contact them and inform them of our society and conference.

To remind you again, we will be celebrating the 50th anniversary of the founding of the IOCV at our conference in October. This past January, a symposium was held in Riverside CA to celebrate the 100th anniversary of the California Citrus Experiment Station in Riverside, and since IOCV was formed during the 50th anniversary celebrations in 1957, Chet Roistacher, Richard Lee and I prepared a poster describing the IOCV history and accomplishments for the symposium. I took advantage of being in Riverside to visit with Chet, Richard, Manjunath Keremane, Robert Krueger, and Georgios Vidalakis.

There are some other items which I need to bring to your attention in good time before the conference:

Nomination of Fellows. If there are any IOCV members who you feel are worthy of becoming Fellows, please send your nominations to me. From the By-Laws, here are the instructions:

"The Organization at its regular conferences or during official pre- or post conference tours may grant the honor of Fellow of the IOCV for lifetime achievement to persons who have contributed significantly to the growth, welfare, functions or activities of IOCV including service to the organization, sustained scientific contributions and otherwise furthering the objectives of IOCV. The Board of Directors shall constitute a committee to consider the granting of Fellowships. Members of IOCV may submit to the Chairperson names and supporting documents or information on the persons to be considered for this honor. Nomination of fellows of the IOCV shall be approved at a regularly convened business session of the Organization by a majority of the delegates. Fellows shall be exempt from payment of regular dues but if in attendance at conferences shall pay the established registration fees. They shall not have the right to hold elective offices. Fellows may serve on committees where because of their interest and qualifications they can contribute to aims and activities of IOCV."

In 2004, the first three Fellows were announced – Josy Bové, Steve Garnsey, and Chet Roistacher.

Future Conference venues. During our meetings in Adana, we will need to decide on where the 18th conference (2010) will be held. I asked a committee of dedicated IOCV members to look at some possible venues, and I know a couple of interesting proposals are being discussed. If you have any suggestions of your own, you are welcome to put together a proposal to present. It will be to our advantage if we have more than one invitation because we may be able to line up venues for 2010 and 2013.

Proceedings on-line. Hopefully, you have visited the IOCV website www.ivia.es/iocv, and noticed that the proceedings of the 14th and 15th conferences are available in pdf format. We are now in process, with the help of Marty Nemeth of the UCR library, of converting all the other proceedings into pdf files. We hope to start uploading them in the near future, working back from the 13th all the way to the 1st.

Business meeting agenda. If there any items that you would like IOCV to discuss, please let Chet Roistacher know so he can include them in the agenda.

Looking forward to seeing as many of you as possible in Turkey.

John daGraça

Conference in India

Y.S. Ahalwat . Convener

I am glad to inform you that the Indian Society of Virology is organizing an international symposium to be held from 11to 14th Dec. 2007.. Please see the web site www.icvt07delhi.org . There will be a session on citrus virology which I have to convene. I therefore take the opportunity to cordially invite you to participate in the symposium. I would appreciate if you please give this announcement in the IOCV newsletter. Please let me know your views about it.

Y.S. Ahlawat

India

Dr. V K Baranwal at our centre has cloned and sequence full genome of CYMBV associated with Rangpur lime and acid lime, two important host plants in India. A simplified membrane based template preparation for PCR detection of greening bacterium and CYMBV has been developed and is being used routinely for detection of these pathogens in PCR. This is an extremely cost effective technique. The latest paper published on greening is

Gouda, K. A., Baranwal V. K., Ahlawat, Y.S. (2006). Simplified DNA extraction and improved PCR based detection of greening bacterium in citrus. J Pl. Biochem. Biotech. 15:117-121.

I hope you have already taken note to put the announcement for the international virology conference www.icvt07delhi.org to be held at IARI, New Delhi from 11th to 14th Dec. 2007.

Dr. R.P. Pant who did his Ph.D. on ICRSV and CYMBV and was workin as an electron microscopist at our centre has joined in Sikkim as senior scientist.

News from A. Catara's group

Detection of Multiple Citrus Viroid Infections in Hunan Province (P.R. China)

Serena Rizza, Patrizia Bella and Antonio Catara (Department of Phytosanitary Sciences and Technologies at University of Catania), made a survey of citrus orchards in Hunan Province (P. R. of China) in cooperation with a research group of Prof. Z. Deng, (Hunan Agricultural University at Changsha). Citrus cultivation in China has increased since the late 1970s, becoming nowadays the largest citrus area in the world,

growing in 22 provinces and municipalities. Hunan province had already developed a large citrus growing area and has undergone a programme to become one of the major citrus producers in the country. Since *Poncirus trifoliata* is the main rootstock, symptoms of citrus viroid diseases such as bark scaling, bark cracking and poor growth have been reported in the past and citrus viroids have been indicated as a limiting factor for citriculture development. A survey had been undertaken to investigate the occurrence of CVds in field trees showing suspicious symptoms. This was done near Changsha and in the County of Xin Ning. Infections of HSVd, CVd-IIId,and CEVd as well as the variant CVd-IIb of HSVd were detected in many RT-PCR tested samples. Mixed infections of the three CVds were detected in many cases. CVd-IIb and CVd-IIIb had never been detected and/or reported before in Mainland China.

Infection of *Citrus Tristeza Virus*, as well as Huanglongbing (HLB) and *Xanthomonas axanopodis* pv. *citri* have been also detected. A large survey is will begin in June, 2007.

Biological and molecular characterization of two Citrus tristeza virus isolates from Sanguinello trees showing inverse pitting on sour orange rootstock. First report in Italy.

In 2005, during a survey for CTV in citrus orchards of Catania Province, some Sanguinello sweet orange trees showing a slight but clear inverse pitting on sour orange rootstock was found in a 30 year orchard. Since this was the first report of symptoms of CTVon sour orange rootstock in Italy, a study was undertaken to characterize the causal agent of the disease through ELISA tests, indexing on indicator plants, and nucleotide sequence analysis.

Molecular analysis showed that the isolates were different from those previously reported (Davino et al., 2005) and suggested that they belonged to a Brazilian strain of seedling yellows-CTV. Sour orange seedlings bark inoculated with the two isolates showed stunting, yellowing and small leaf size.

Allan Dodds

University of California, Riverside

I am retiring on June 29, 2007 from the Dept. of Plant Pathology, UCR.

IOCV meetings and members will be a big part of happy memories from a career that included encounters with citrus viruses and virologists.

(Below: Allan Dodds in his younger days)

News from India - Gopal

Dr. Gopal **was awarded the following for his research mainly bud transmissible diseases of citrus:**

- ***Outstanding Agricultural Scientist award for the year 2006*** **was received from AP Council for Science and Technology, Hyderabad in April 2006.**
- ***Outstanding Young Scientist award*** **was received from Indian Society of Mycology and Plant Pathology, Udaipur in 28th Annual Conference and National Symposium held at GB Pant University of Agriculture and Technology on 9th November 2006.**
- ***A.V. Krishnaiah memorial award*** **for the year 2003 by A.N.G.R. Agricultural University, during 2006.**

Dr. V.R. Reddy, **Director, International Programmes, USDA, Beltsville, USA visited our institute during January 2007 and he appreciated the work done on HLB and CYMV.**

Two HLB isolates one each on sweet orange and acid lime; 4 CYMV isolates one each from sweet orange, acid lime, pumello and Rangpurlime, one CTV isolates of acid lime were sequenced and submitted to the gene bank.

Gottwald and Irey - Florida

Post-hurricane Analysis of Citrus Canker II: Predictive Model Estimation of Disease Spread and Area Potentially Impacted by Various Eradication Protocols Following Catastrophic Weather Events

Gottwald, T. R., and Irey, M. 2007. Post-hurricane analysis of citrus canker II: Predictive model estimation of disease spread and area potentially impacted by various eradication protocols following catastrophic weather events. Online. Plant Health Progress

doi:10.1094/PHP-2007-0405-01-RS.

Abstract

The impact of 2005 Hurricane Wilma on the dissemination of *Xanthomonas axonopodis* pv. *citri* (*Xac*), the cause of Asiatic citrus canker (ACC), and subsequent disease development was examined and predictions for the areas into which *Xac* was likely to have spread from known sources of infection were developed. In addition, the effect of the current 579-m (1900-ft) ACC eradication protocol, resulting in removal of all "exposed trees" with a 579-m radius of a known *Xac*-infected tree, was calculated via GIS analysis and expressed as the predicted "impacted area." The GIS calculations were based on the extension of the previous published wind-rain index vector (WRIV) model. The model extension consisted of the incorporation of an estimate of distance of spread due to various combinations of wind and rain from data collected during the 2004 hurricane season. An inverse power law dissemination function was used to describe regional dispersal from a point focus of *Xac* infection. Alternative eradication protocol (distances) to the 579-m protocol were evaluated in association with the GIS analyses and used to examine the effect of eradication distance on predicted "impacted area." The results of these analyses were used by state and federal regulatory agencies and commercial citrus producer groups to evaluate the feasibility of continued ACC eradication.

First detection of *Citrus leaf blotch virus* in Italy

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Last year, nurserymen reported to CRA - Istituto Sperimentale per l'Agrumicoltura observations of the bud union disorder of 'Nagami' kumquat and Calamondin scions propagated on Troyer citrange rootstock. These plants showed reduced canopy volume and new shoots below graft points six months after propagation; the bud union was brittle and broke easily after one year. So we started to monitor the plants in different nursery. After tests excluded common citrus viruses and viroids which might cause the incompatibility we tested for *Citrus leaf blotch virus* (CLBV), a virus previously associated with a bud union crease in kumquat. Leaves were collected from 100 'Nagami' kumquat (50 grafted on sour orange rootstock and 50 grafted on Troyer citrange rootstock) and 80 calamondin grafted on Troyer citrange rootstock collected in a nursery near Messina (Sicily-Italy) and from 30 Calamondin grafted on Troyer citrange rootstock collected in a nursery near Mazara del Vallo (Trapani – Sicily - Italy); Total RNA was extracted using Qiagen Rneasy Plant mini Kit (Qiagen S.P.A. Milan, Italy). Primers previously reported (M.C. Vives et al. 2001, Virology 287:225-233), were used in reverse transcription polymerase chain reaction (RT-PCR) assays to amplify the RNA-dependent-RNA-polymerase gene and the coat protein gene. All kumquat samples yielded amplicons of the expected size, 456 bp and 438 bp, while calamondins collected in the first nursery were negative. Consensus sequences of the two amplicons from kumquat (Genbank Accession Nos EF203229 and EF203230) had 96% and 97% nucleotide sequence identity, respectively, and both had 99% amino acid identity with CLBV. (This information is in press in Plant Disease). The detection of calamondin samples collected in a nursery near Mazara del Vallo (Trapani – Sicily - Italy), yielded amplicons of the expected size, 456 bp and 438 bp. Now I am sequencing the two genes from calamondin. Infection of CLBV can cause decline associated with bud union disorders of Kumquats and Calamondin grafted on Trifoliate orange, Citrange or Citrumelo producing losses in production of citrus ornamental plants. This is serious drawback becouse about 700.000 ornamental plants of Kumquats and Calamondin are produced annually in Italy.

Letter of May 8th, 2007 from Klaus Bederski - Peru

Cross protection is working.

I should like to invite you and Gerd to come and see the current situation of cross protection in Peru. The good cross protective strains continue to perform very well and a follow up report is really worth writing for presentation at IOCV Turkey 2007.

Passiflora code 37C and *Citrus aurantifolia* Topara are remarkable, but also Passiflora codes 37B and 40A have a place in the cross protection story. Code 37C is protecting (believe it or not) - sour orange *Citrus aurantium* as scions on 5 different rootstocks. They are growing nicely when the rootstocks had been protected with Code 37C or with small fruited lime *C. aurantifolia* Topara. However, with the other protective sources, the sour orange scions look sorry on all rootstocks. My two Old Line Washington Navel trees on sour orange rootstock carrying a mixture of 6 protective sources are now 9 years old and have their best crop ever with nice, uniform big fruit and good graft unions. The trees are small and there is a potential of 40 tons per hectare.

Chet Roistacher and Gerd Muller will be visiting Klaus Bederski at the Topara nursery in Peru in early June, 2007 to observe recent developments in cross protection against the severe Peru stem pitting strains of CTV. These strains had devastated the Peru navel orange industry as well as Valencia oranges, tangelos. It had not been possible to grown limes or grapefruit in the presence of these severe CTV strains plus its prime aphid vector *Toxoptera citricida* .

Roistacher C.N. (1988). Observation on the decline of sweet orange trees in coastal Peru by stem pitting tristeza. FAO Plant Prot. Bull. 36: 19-26.

Bederski, K, C.N. Roistacher and G.W. Müller (2005). Cross protection against severe Citrus tristeza virus. Stem pitting in Peru. *In*: Proc. 16th Conf. IOCV, 117-127, IOCV, Riverside, CA.

Citrus Tristeza Virus in Belize – 1984 to 2007

Veronica Manzanero Majil,

Belize Citrus Certification Program Coordinator, Citrus Research and Education Institute, Belize Citrus Growers Association, Mile 9 Stann Creek Valley Road, Stann Creek District, Belize.

CTV has been a primary concern in Belize since it was first detected in the country in 1984 and since the industry became aware of the devastation caused by the disease to citrus industries worldwide. In response, the industry identified and destroyed trees found to be infected with severe (decline-inducing) strains of CTV, established a citrus nursery certification program, promoted the use of CTV tolerant rootstocks and since the arrival of the Brown Citrus Aphid (in 1996), monitored the spread of CTV through the country's groves. Since that time, mild strains of CTV have spread widely in the industry, but severe strains have not been detected again, until recently in 2004. In this recent detection, six (6) trees on sour orange were found to have died from infection with severe strains of CTV. Could this be the beginning of the wider decline of trees on this rootstock that has been expected?

The first detection of the virus was in 1984 but it wasn't until 1991 that a regional (Central American) survey was conducted. This survey showed that 3% of citrus trees in Belize were infected with CTV. Later in 1993, a country wide survey conducted in Belize revealed a 15% CTV incidence for milder forms of CTV strains and a 4% incidence for severe strains (which tested positive to the Florida MCA13 antibody). Trees testing positive to CTV using MCA13 in the 1993 survey and which expressed three or more physical field symptoms of CTV were destroyed. Around 90% of the Belize citrus industry was planted on sour orange (a CTV susceptible rootstock), at that time, and so these levels of infection were of great concern. Belize needed to diversify its citrus rootstocks away from sour orange while ensuring that new plantings were on healthy disease-screened material. This required the establishment of a certification program.

In 1996, a grant from the Food and Agriculture Organization (FAO) of the United Nations funded the establishment of such a citrus certification program. Eleven years later, Belize now has a mandatory certification program that is legislated under the laws of Belize. The program includes a germplasm collection (with 40 citrus varieties originated from the National Clonal Germplasm Depository for Citrus and Dates in California) that provides source material for nursery budwood multiplication blocks and a program that regularly tests these multiplications blocks for the presence of CTV (and other graft transmissible diseases). This certification program was implemented at a time when world citrus prices were very high and many in the Belize citrus industry were expanding their groves. The establishment of a certification program at a time of rapid industry growth has resulted in 70% of the industry in Belize now being on CTV tolerant rootstocks (compared to less than 10% before 1995) - the majority of which have originated from certified plants. The remaining 30% of the industry was still considered to be a very significant portion of the industry. It was thus considered a priority to identify and eradicate any tree testing positive for severe strains of CTV.

The FAO grant also supported the implementation of an updated CTV survey for Belize. The CTV survey was started in July of 1996 with the objective of eradicating all trees testing positive for the severe forms of CTV, but it was stopped in October of that year when the Brown Citrus Aphid (BrCA), *Toxoptera citricida*, was discovered in the country. It was thought at the time, that in the presence of the BrCA (the most efficient vector of the virus), the data collected would become quickly outdated: defeating the survey's objective. Another approach was required.

In 1997, trials to monitor the rate of spread of CTV, in the presence of BrCA, were established in four plots of 20 X 20 Valencia orange trees (400 trees) on sour orange rootstock. The plots are located in the three major citrus producing districts and were selected based on their initial high and low CTV incidences. Initially (1997), Plot 1 located in the Cayo district, in the west of Belize, had a CTV incidence of 11%, Plot 2 located in the Toledo District, in the south of Belize had a CTV incidence of 0.8 %, Plot 3 in the Stann Creek District, in the centre of Belize and the heart of the citrus industry, had 4.8% and Plot 4 with 9.3% (Stann Creek District). In 2007, Plot 1 had a CTV incidence of 97%, Plot 2 is no longer being monitored as it did not recover after damage from hurricane Iris). Plot 3 has 20% and Plot 4 has 91%. Since 1997, no severe forms of CTV were detected (using MCA13) nor did any of the trees decline due to CTV. Data collection from these plots continues every six months. In 2004, in a separate location from the trial plots, the first detections since 1997, of severe CTV strains were made. Three infected trees were found in a budwood multiplication block in the Stann Creek District, when tested against the MCA13 antibody. Then, in 2005, three

declining grove trees on sour orange, again in the Stann Creek District, tested positive to severe CTV (MCA13 positive). The following year, in 2006, six more declining trees on sour orange, also in the Stann Creek District, tested positive for severe CTV This increasing incidence of severe CTV strain may be the beginning of CTV induced sour orange decline, ten years after the arrival of the BrCA in Belize. A country wide survey, for decline symptoms, in sour orange groves will be carried out in August 2007.

Figure 1: Combination of Valencia sweet orange on sour orange rootstock declining from CTV infection. Note the pronounced dieback and pale green leaves compared to non-declining tree on left. *(Photo: Veronica Manzanero Majil, CREI).*

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Recent progresses on Citrus leprosis virus in Brazil

E.W. Kitajima[1], C.M. Chagas[1], Juliana Freitas-Astua[2] & J.C.V. Rodrigues[3] [1]ESALQ, CP 9, 13418-900 Piracicaba, SP, Brazil; [2]Embrapa/Centro APTA Citros Sylvio Moreira, CP 4, 13490-000 Cordeirópolis, SP, Brazil; [3]Univ.Puerto Rico, Estación Experimental Agrícola, Jd.Botánico Sur, Crop Prot.Dept., Coll.Agric.Sci., 1193 Calle Guayacan , San Juan, PR 00926, USA

Over the last ten years, knowledge about the basic properties of Citrus leprosis virus has progressed quickly

1. **Electron microscopy works had revealed (Kitajima et al. Virology 50: 234. 1972; Colariccio et al. Fitopatol. Bras. 20: 208. 1995) that two distinct types of cytopathic effects were associated with leprosis symptoms. Subsequent studies indicated that two different viruses, both transmitted by the tenuipalpid mite *Brevipalpus phoenicis*, causes leprosies: (a) the prevalent cytoplasmic type- CiLV-C (short, bacilliform virions present within endoplasmic reticulum cisternae, and a characteristic electron dense mass [viroplasm] in the cytoplasm); (b) a very rare, nuclear type- CiLV-N (short rodlike particles present in the nucleus or cytoplasm and an electron lucent viroplasm in the nucleus) (Kitajima et al. Exp .Appl. Acarol. 30: 135. 2003; Rodrigues et al. Exp. Appl. Acarol. 30: 161. 2003) and may be a member of the newly proposed genus *Dichorhabdovirus*, in the *Rhabdoviridae* family whose prototype is the Orchid fleck virus (OFV) (Kondo et al., J. Gen. Virol. 87: 2413. 2006). There is a slight difference in the leaf lesions caused by CiLV-N which tend to be smaller than those caused by CiLV-C, with a necrotic center surrounded by a bright yellow halo. So far, CiLV-N has been registered in some few sites in Brazil and in the Northern Panama.**
2. **A comprehensive review on *Brevipalpus* biology, external anatomy and the viruses they transmit, including Citrus leprosis, was published in the vol.30, 2003 of Experimental and Applied Acarology, edited by C.C. Childers and K.S. Derrick, from CREC, Univ. Florida/Lake Alfred.**
3. **Works by J.C.V. Rodrigues (PhD thesis, CENA/USP. 2000) revealed that mites could experimentally transmit the CiLV-C to citrus seedlings, and that dsRNA could be extracted from the tissues of the leprotic lesions. Later this work was confirmed with field samples infected by CiLV-C (Colariccio et al. Proc. 14th Conf. IOCV: 159. 2000). Based on this dsRNA Locali et al. (Plant Dis. 87: 1317, 2003) managed to obtain partial sequences of the virus and designed primers that specifically amplify cDNA from infected lesions and viruliferous mites, developing for the first time a molecular tool for CiLV-C detection.**
4. **Sequencing work was extended and the complete sequence of CiLV-C genome was obtained by Pascon et al. (Virus Gene 32: 289, 2006) from the biotechnology company Allelyx (Campinas, SP , Brazil) and Locali-Fabris et al. (J. Gen. Virol. .87: 2721, 2006) from the Centro APTA Citros Sylvio Moreira (Cordeirópolis, SP, Brazil). CiLV-C genome is bipartite (ca. 5 and 9 kb), ssRNA, positive sense with a poly-A tail. It is different from known viruses and a new genus, *Cilevirus*, has been proposed (Locali-Fabris et al., 2006). In addition to Brazilian isolates, there is a report of a full sequence for a Panamanian isolate of CiLV-C (Guerra et al. unpublished - GenBank DQ388512 and DQ388513, 2006).**
5. **Some researches are being carried out on the ultrastructure of viruliferous *B. phoenicis* mites. CiLV-C-like particles have been found on few occasions in the prosomal glands but not viroplasms (Kitajima et al., I Res. Simp. Bras. Acarol. p.248. 2006). On the other hand, virions and nuclear viroplasm were observed in *B. phoenicis* collected from CiLV-N infected sweet orange trees (Kitajima, unpublished data). Based on these observations, we are working with the hypothesis that CiLV-N is propagative in the mite vector while CiLV-C is of a circulative type.**
6. **Anatomical works on leaf, fruit and stem lesions caused by CiLV-C indicate that there is hypertrophy in some of the spongy parenchyma cells, and some hyperplasy in the palisade parenchyma cells, usually above the vascular region (Marques et al. Abst. Cong. Bras. Botânica. 2004). Electron microscopic observations revealed that in young lesions these anatomical changes are not yet present, and most of the parenchymal and epidermal cells contain virions and cytoplasmic viroplasms, but in older lesions, when hypertrophy and hyperplasy are present, virions and/or viroplasmas are found in very few, usually clustered cells (Gomes et al., Abst. XII Cong. Bras. Biol. Cel. 2004).**
7. **Mechanical infection of some herbaceous host and sweet orange was achieved by Colariccio et al. (1995). Mite transmission of CiLV-C was for the first time reported in a non-Rutaceae species, *Solanum vioalefolium* (Rodrigues et al. Plant Dis. 89:911. 2005). Natural infection of *Swinglea glutinosa*, a non-*Citrus* Rutaceae used as wind breakers around sweet orange orchards, by CiLV-C was noticed in Villavicencio, Colombia (Leon et al., unpublished data). Several plant species (*Hibiscus rosa-sinensis, Bixa orelleana, Malvaviscus arboreus* and *Commelina benghalensis*) could also be experimentally infected by CiLV-C,**

using viruliferous *B. phoenicis* (Nunes et al. Res. I Simp. Bras. Acarol. 218, 2006).

8. **CiLV-C seems to be moving Northbound from endemic areas in South America. So far, CiLV-C was confirmed in several South American countries besides Argentina, Paraguay, Uruguay and Brazil, as Bolivia, Colombia and Venezuela. It is reported in most countries of the Central America and has reached South of Mexico, in North America. Citrus leprosis was first described in Florida, USA, in the early 1900's, and it was of major concern up until the 1930's after which it disappeared from Florida apparently due to a series of events affecting the citrus industry like freezes, spray programs, and quarantine practices. It has not been reported in Florida since the 1970's (Childers et al., Exp. Appl. Acarol. 30: 181, 2006). Thus there is a concern about the possibility of the re-introduction of the disease in the US, as well as in the Caribbean islands where the virus was never detected.**

9. **Epidemiological works on CiLV-C have been conducted by Rodrigues (PhD Thesis, CENA/USP, 2000) showing the temporal dynamic of the disease, which adjusted to a logistic model, on nine citrus varieties. Also, diagrammatic scale to disease severity was developed and validated (Rodrigues et al., Summa Phytopath. 28:192. 2002). Experiments organized by Fundecitrus (Araraquara, SP) demonstrated that in commercial sprayed orchards the degree of aggregation of plants with disease symptoms was higher than that of mite infested plants (Bassanezi & Laranjeira. Plant Pathol. 56: 97. 2007). Studies on chemical control of the vector *B. phoenicis* revealed that the mite populations may develop resistance against the acaricides (Campos & Omoto. Exp. Appl. Acarol. 26: 243. 2003; Neotropical Entomology 35: 840. 2006).**

10. **Damages due to citrus leprosis infection in different sweet orange varieties were determined (Rodrigues et al. 2000. Proc. Int Soc. Citr.: 1955) and temporal epidemiology of the disease has been described. Economic losses and costs associated with disease control were studied and presented (Dragone et al. Laranja 24:311. 2003). New control tactics were designed (Rodrigues et al. Laranja 22:412. 2001) and have been recommended for application in commercial systems (Yamamoto & Parra. In: Matos et al. Citros. Cordeirópolis, SP. 2005).**

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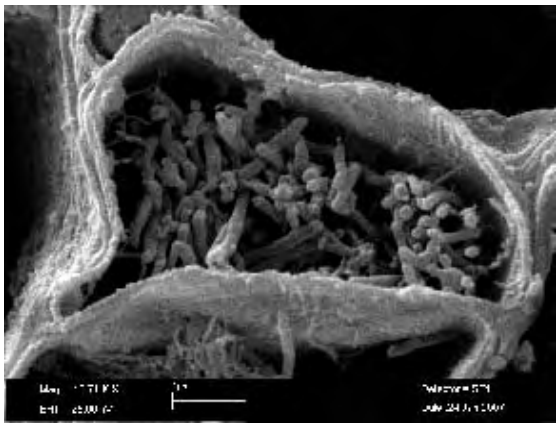
Below: **Scanning electron microscopic image of a leaf phloem vessel of periwinkle (*Catharanthus roseus*) invaded by Liberibacter americanus, causal agent of the HLB. Periwinkle was experimentally dodder-infected from HLB-infected sweet orange as source. (Micrograph taken by F.A.O. Tanaka and E.W. Kitajima)**



Pete Timmer & Dr. Browning

Pete Timmer Retires After 28 Years at CREC

LAKE ALFRED, Florida – Dr. Lavern W. "Pete" Timmer, Professor of Plant Pathology, will retire after more than 28 years of dedicated service to citrus research at the University of Florida, Institute of Food and Agricultural Sciences, Citrus Research and Education Center.

Several events are planned in his honor. First, Dr. Timmer will present "From Anthracnose to Xanthomonas – The Career of Pete Timmer in Citrus Pathology," a look back at his distinguished work, on Friday, April 20 from 1:30 until 3 p.m. in the Ben Hill Griffin, Jr. Citrus Hall at the CREC.

Immediately following the seminar, a retirement social will be held in Timmer's honor from 3 until 4 p.m. also in the Ben Hill Griffin, Jr. Citrus Hall at the CREC.

That evening, a reception will be held in the Lake Wales Country Club Ballroom from 5 until 8 p.m. The evening is hosted by the citrus industry with hor'dourves and a cash bar will also be available. Everyone is invited to attend these events.

Dr. Timmer graduated from Michigan State University with a bachelor's in botany and plant pathology. He earned his PhD in plant pathology from the University of California, Riverside. From 1970 to 78, he was plant pathologist at the Texas A&I Citrus Center in Weslaco, Texas where he also worked on citrus diseases. Early in his career at CREC, he was instrumental in developing diagnostic techniques and demonstrating graft transmissibility of citrus blight. He developed assay procedures for Phytophthora populations in soil and demonstrated the effects of this pathogen on citrus yields. His most recent research program has focused on fungal and bacterial diseases of citrus trees, such as greasy spot, melanose, and scab. He has determined the environmental factors affecting the different diseases and developed predictive models for postbloom fruit drop and Alternaria brown spot. Many fungicides have been evaluated and spray programs have been developed to improve control of most of the foliar fungal diseases.

In recent years, his extension education program emphasized citrus canker and greening disease and he has developed useful tools for growers for identification, survey, and detection of these diseases.

Dr. Timmer has been active in the American Phytopathological Society (APS) as Associate and Senior Editor of both Phytopathology and Plant Disease and edited the Compendium of Citrus Diseases and Citrus Health Management.

He received the Lee Hutchins Award from APS for excellence in research on tropical fruit crops for his work on postbloom fruit drop and is a Fellow of that Society. In the past, he also served as editor of the proceedings of Florida State Horticultural Society and the International Organization of Citrus Virologists. In recent years, he served as editor of the Florida Citrus Pest Management Guide.

He was named Distinguished Research Professor of University of Florida in 2003 and Distinguished Scientist at CREC in 2006. He served as the Assistant CREC Center Director from 1991 to 1993, and as manager of Grove Operations for the last several years.

Dr. Timmer and his wife, Nancy, live in Lake Alfred.

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AN UNEXPECTED VISIT: *Toxoptera citricida* IN NORTHERN PART OF THE IBERIAN PENINSULA. THE CURRENT SITUATION 2007.

Mariano Cambra - Spain

At the beginning of 1994 *Toxoptera citricida* (or *T. citricidus*, but we prefer to maintain the tradition of the IOCV and will use *T.citricida* in this text), was detected for the first time in Madeira (Portugal). In November 2003, a single aphid was accidentally found by Dr. F. Ilharco in the Entre Douro e Minho region in mainland Portugal. In 2004 the presence of *T. citricida* colonies was detected in citrus trees not only in this Portuguese region but also in the neighbouring Northern Spain. Indeed we have evidence that it was present in this region at least since 2002. The events occurred as follows: From May to September 2002, 2003 and 2004, Almudena Álvarez, placed four yellow traps along the coast of Asturias (see the attached map), as part of her PhD project, to monitor aphids in *Phaseolus vulgaris* fields. In December 2004 she began to classify the aphids caught during the three monitored years and she was most surprised when, in addition to other aphid species, she found *T. citricida* (identified by Dr. N. Pérez Hidalgo, University of León, Spain) in all traps from the three years. To confirm aphid identity she sent some specimens to the Reference Laboratory for Entomology of the Ministry of Agriculture in Madrid (Dr. P. del Stal) and to Dr. A. Hermoso de Mendoza (IVIA, Valencia). All laboratories confirmed that *T. citricida* was the aphid species caught in Asturias (43º 20' to 43º 39' North , a latitude where *T. citricida* had never been found before).

In March 2005 the presence of *T. citricida* in mainland Portugal and in Spain was reported by Ilharco et al.(Agronomia Lusitana 51 (1), 19-21; 2005). The IVIA reacted immediately and two projects were funded to study the incidence of *T. citricida* in Northern Spain, the behaviour of this aphid species in this area, its biological cycle and hosts, biotype (see note), enemies, possibilities of control and risk assessment for potential spread of this aphid to the Mediterranean areas with extensive citrus cultivation. Permanent personnel under IVIA contract was located in Asturias in coordination with local Authorities of Plant Protection Services. In June 2005, we organized in co-operation with the central Ministry of Agriculture (MAPA) and local Governments of different Spanish regions, a *T. citricida* / CTV survey all the way from Valencia through Zaragoza (Ebro Valley) to the Basque Country, Cantabria and Asturias. All public gardens, botanical collections, and private and public properties growing citrus in these regions were visited with the co-operation of the local Plant Protection Services. *T. citricida* was only identified in Eastern Cantabria (just in the border with the Basque Country) along all the coast to Asturias and in all sites surveyed in Asturias. The species was found basically in the abundant lemon trees. CTV was found only in 3 sweet orange/citrange Carrizo trees, grown in the Basque Country out of 416 that were analysed *in situ* by Tissue print-ELISA with specific monoclonal antibodies 3DF1 and 3CA5.

In 2006, Mariano Cambra participated, as an European Union (UE) expert on CTV, in a mission carried out in Portugal from 5 to 9 June in Madeira and mainland Portugal in order to assess the current situation regarding *T.citricida* and CTV. According to the EU legislation, a mission headed by the official UE inspector Donata Meroni (Directorate F-Food and Veterinary Office, Health and Consumer Protection Directorate General) evaluated the actions taken in the Portuguese regions where this pest occurred. The mission assessed that *T. citricida* was detected in 23 counties in Entre Douro e Minho region, in two counties in Beira Litoral and in one county in Trás os Montes region. In the first two regions citrus fruit and citrus plant production is not significant, but Beira Litoral concentrates about 95% of the Portuguese citrus plant nurseries. So far, CTV has been found in very few trees in these regions and these trees have been destroyed. Contrarily, the prevalence of both *T.citricida* and CTV in Madeira is very important. In addition, *Trioza erythreae* (the African citrus psylla, vector of Huanglongbing disease) is present all around in the island. The incidence of these harmful pests and CTV is so high that it hampers citrus cultivation in the Portuguese region of Madeira.

In July and September 2006, we organized another survey in the coastal regions of Galicia from the Portuguese border to Asturias. The goal it was to verify the continuity of the presence of *T. citricida* along the coast from Portugal to Galicia, Asturias and Cantabria (Spain) and to survey CTV in this area. The aphid was found everywhere in this coast and no citrus tree was found CTV infected (730 tested by Tissue print-ELISA). As a curiosity, *T.citricida* was found in the Finisterre cape in La Coruña /Galicia (500 years ago considered the end of the earth).

The North of Spain is a wonderful area where historical sites, gastronomy and nature conjugate with a mild and humid climate along a beautiful coast. In winter time a minimum temperature of 0ºC is usual, but occasionally it may reach -5 ºC for a few hours. Nevertheless, as you can imagine, citrus are grown in temperate areas, localities with a special microclimate, or placed in protected sites or under plastic protection. The area is very rainy and humid all the year making a peaceful green landscape. The average temperature in summer time is 26ºC. No citrus nurseries are located in the area. No CTV spread has been detected, probably due to the very low, if any, prevalence of the virus in Northern Spain.

In summary, after two years studying *T. citricida* in Northern Spain we can conclude:

1)The origin of the pest remain unknown but probably it was introduced in Northern Spain before 2001, with plant material transported from Central Africa or South America by fishermen or professional sailors. *T. citricida* has been detected only in citrus (no alternative host was found) and it is present in Northern and Western regions of the Iberian Peninsula, reaching the Basque Country eastwards and middle Portugal southwards.

2) Low populations of adults survive in winter in isolated lemon trees protected from the low temperatures. These surviving individuals are usually located in flower buds or in the insertion of the peduncle with the fruit. The species was essentially found in the numerous lemon trees traditionally grown in backyards but also in some scarce sweet and sour oranges and mandarin trees.

3) *T.citricida* populations increase in May. First instar larvae appear and adult apterae build up colonies of relative importance. The first winged individuals are caught in yellow traps from mid May to the end of June. Two population peaks are found, one in mid July and another one in September. The last winged individuals are caught at the end of November. From mid December to April *T.citricida* populations are extremely low and difficult to observe in previously infested trees. No sexual phase has been detected.

4) Parasitoids and predators of *T.citricida* in the North of Spain are relatively abundant but they do not differ from those previously described for other aphid species in the Mediterranean areas.

5) Control treatments are being assayed in Asturias (in Villaviciosa city and in selected areas at the same municipality) and in Cantabria (in the municipality of Novales where approximately 8 ha, the highest concentration of citrus in the North, are grown). The goal is assessing the efficiency of chemical treatments performed when low populations are present, before implementation of massive treatments in potential "firebreaks" to avoid spread into the Mediterranean citrus growing areas.

6) Additional measures to control spread of the pest to citrus growing areas in the Mediterranean include intensification of *T.citricida* and CTV surveys, prohibition to move citrus plants out of the infested area, including the return of plants previously sent to garden centres from nurseries located in Southern regions, training courses on identification of the aphid species, coordination meetings organized by the MAPA with different Local Spanish Governments (Local Governments are presently responsible for decisions on agriculture and plant protection, whereas the MAPA is responsible for coordination between regions and with other countries), vulgarisation about the pest, and intensification of common actions devoted to a better cooperation between Portugal and Spain.

Members of the IOCV and other participants in our next congress in Anatolia (Turkey) will be updated on this problem that could affect all the Mediterranean Basin.

Mariano Cambra

Additional note:

Dear colleagues,

We are studying the biotype of T. citricida that is spreading in Northern Spain and Portugal (see the above information) and we need your cooperation.

We would be pleased of receiving colonies of T.citricida apterae from different citrus hosts and geographical origins from your countries. We need aprox. 50 adult individuals from the same colony, directly introduced in 70% ethanol in an Epperdorf tube or similar (a piece of the shoot or leave or flower bud, harbouring the aphid species can be also introduced in a 50 ml plastic tube containing alcohol). Close carefully the tube and, address the specimens to: Dr. Mariano Cambra. IVIA. Carretera de Moncada-Náquera km 5, 46113 Moncada (Valencia), Spain.

Please, send us colonies of T. citricida for scientific purposes. Your cooperation will be welcome and gratefully acknowledged.

If you have any doubt, please do not hesitate to contact me (mcambra@ivia.es ; Tel.: 0034 609156916; Fax: 0034 963424001).

In case you collected a high number of tubes (colonies from different origins) you can also send the tubes by any international courier free of cost (to be paid by the IVIA).

Thank you very much. Be sure your contribution will be very much appreciated.

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From Robert Krueger

USDA-ARS-National Clonal Germplasm Repository

Riverside, California

The Mexican Federal Government is in the process of establishing a citrus introduction and sanitation facility for several years. The facility will allow the introduction of new commercial varieties into Mexico, as well as the sanitation of existing local selections. This will complement the Mexican Government's efforts in the reconversion of their important citrus industry from sour orange to CTV-resistant rootstocks, as well as providing an important resource in dealing with exotic or emerging citrus diseases.

Robert Krueger of the Repository has been providing advice and counsel to the project for several years. The Repository also provides pathogen-tested budwood and other resources to the project and to various other entities in Mexico. In January, Robert visited the newly established Estación Nacional de Cuarentena y Saneamiento Vegetal in Marquéz, Estado de Querétaro and met with the Station Coordinator, Pedro Robles, and the rest of the staff.

The station was completed in November, 2006 and was not yet functional at the time of the visit. The facilities consist of greenhouses for indexing and propagation, laboratories for various tests, a shoot-tip grafting area, offices, etc. The greenhouses and laboratories were still being equipped in January and it is hoped that they will begin functioning within the year. Various other supporting facilities are still to be established as well (seed source trees, protected maintenance area, etc).

Jaime Sánchez, the greenhouse coordinator for the Station, will visit the Repository this summer for training in greenhouse management, biological indexing, the use of the UC System, and other topics pertinent to the operation of the Station. Other SAGARPA personnel will also be attending the training session. Chet Roistacher has graciously agreed to provide several of his excellent lectures in pertinent areas.

Robert also attended the NAPPO meeting in Manzanillo, México as an observer/commentator accompanying Citrus Panel member Georgios Vidalakis, CCPP, in March. The various countries have come into fairly close agreement as to the testing procedures to be used in citrus introductions or certifications. There was also a half-day tour of the Manzanillo citrus producing area, which is an important Mexican lime producing area. Disease pressure in this area is believed to be low due to the original seedling provenance of the local Mexican lime sources many years ago. However, other varieties originated in Veracruz and other states and so pathogens may have been introduced through that mechanism. In addition, the genetic disorder wood pocket was observed on some of the Persian lime plantings.

Historically, last fall Robert and Chet Roistacher visited the original 'Parent Washington' tree in Riverside along with other personnel from UC Riverside and the City of Riverside. The Parent tree is still healthy looking at 134 years of age with a

decent crop and green foliage. The Parent tree was again indexed this year and does not appear to have any threatening pathogens present. The index confirmed the previous knowledge that the Parent has vein enation and CVd-IIa.

On a more somber note, on May 3rd, 2007 saw the abrupt and unexpected departure of Dr Benjamin Rangel. Benjamin's departure leaves a giant hole in the Repository staff and functioning. Benjamin has a very active mind and was actively investigating new and more efficient ways to assess the status of various citrus pathogens, as well as seed transmissibility and genetic relationships between the citrus accessions. He was also the Repository staff member active in carrying out routine laboratory tests in support of the indexing program. The staff could always count on his hard work, diligence, team spirit, willingness to help others, and positive, "can do" attitude. He will be greatly missed. Vaya con Díos, Benjamin.

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From Richard Lee

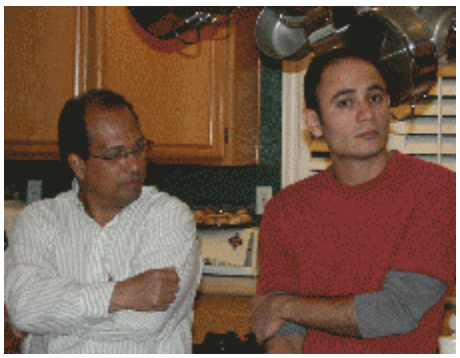
USDA ARS National Clonal Germplasm Repository for Citrus and Dates, Riverside, CA.

Carlos Ramos is visiting the Repository as a visiting scholar to work on molecular characterization of *Citrus tristeza virus* and quantitative real time PCR methodology. He is a faculty member of the University of Panama's Department of Genetics and Molecular Biology, Panama City.

Abby Guerra-Moreno, graduate student from Panama working on his Ph.D with Ron Brlansky, University of Florida's Citrus Research and Education Center, Lake Alfred, FL visited the Repository for three weeks beginning April 16th. He worked with Manjunath Keremane and R. Lee on characterization of citrus leprosis virus.

Five visitors from Costa Rica (M. R. Quesada Ugarte, V. Hugo Alfaro, J. Solano, S. Hernandez, and M. Gonzalez) will spend the week on May 21, 2007 at the Repository participating in a workshop on biological indexing and greenhouse management. Costa Rica is beginning a citrus certification program in order to maintain citrus production in the threat of citrus variegated chlorosis, leprosis, threat of huanglongbing, and other diseases.

Carlos Ramos, left, and Abby Guerra-Moreno, right.



Rehabilitation of citrus in Nepal
Chiranjivi Regmi, NAST

Nepal Academy of Science and Technology (NAST)

Nepal grows mainly mandarin and some sweet orange trees. Most citrus is grown as seedling trees. Since the 1960s, huanglongbing (HLB) has been present in the country. In the frame of a project involving France, Nepal and Spain, we have taken steps to replace seedling trees by grafted trees, and control HLB. The project is operated by a Nepalese Non-Government Organization (NGO), ECARDS, in collaboration with NAST (Nepal Academy of Science and Technology, Nepal), INRA/University of Bordeaux 2 (Bordeaux and Corsica, France), and CERAI (Valencia, Spain). The project is supported financially by the French Cooperation through the Food Security Programme for Nepal.

An insect-proof nursery has been constructed and has started to produce mandarin trees grafted on *Citrus volkameriana*, *Poncirus trifoliata* and Carrizo citrange. Mother trees have been selected from 30-year-old seedling mandarin trees at the Citrus Research Station, Paripatle of Dhankuta district and were indexed and found free of viroids. Several demonstration orchards have been planted in collaboration with the farmers. Guava trees will be planted among the citrus trees to check their beneficial effect on HLB control, as reported from Vietnam (*See graphs of control of various insects by Guava interplants*).

Nuria Duran-Vila and Josy Bové, with the collaboration of Chiranjivi Regmi, and other Nepalese colleagues (see picture inset) have recently carried out surveys, respectively for viroids and HLB. Clear-cut symptoms of exocortis were observed at the Pokhara experiment station on several sweet orange and mandarin lines on *P. trifoliata*. Laboratory tests have confirmed the visual symptoms. Control of HLB has never been initiated in Nepal, and orchards with 100% of HLB-affected trees are being seen more frequetly. During the survey, many leaf samples with blotchy mottle symptoms were collected from places including Udipurof Lamjung, Bimal Nagar, Tanahun Bharat, Polkhari, Kaski and Putalibazar of Syangja districts. They gave positive PCR amplification for the Asian HLB-agent, Ca. *Liberibacter asiaticus*.

This indicates that actions to control HLB has to be taken immediately by the government of Nepal. Support from FAO , EU and other agencies is highly desirable.

NAST has established PCR laboratory with the cooperation of French Government and Prof. Bove and Late Dr. Garnier in October 2002 . Since then we are carrying out HLB testing . More than 1500 samples have been already tested our lab.

showing Regmi (far left) Bové and Nuria

Ali Pakniat - IRAN

Serology and Survey of Citrus tristeza virus in Southern Iran

A. Pakniat[1], K. Izadpanah[2], A.R. Afsharifar[2], M. K. Mosallaie[3]

1-Agricultural Research Center of Fars, Darab, Iran, 2- Department of Plant Protection, Shiraz University, Shiraz, Iran

3- Plant Protection Office of Fars Province, Shiraz, Iran

Three monoclonal (MCA13, 3DF1 and 3CA5) and three polyclonal (local, Bioreba and Agritest) antibodies were used to compare southern and northern isolates by indirect-ELISA (I-ELISA) and indirect tissue print immuno-assay (I-TPIA) for detection of Citrus tristeza virus (CTV). One northern CTV isolate reacted with all monoclonal antibodies, but none of the five southern isolates tested did so. Bioreba and Agritest polyclonal antibodies could detect northern and southern isolates in I-ELISA. Locally prepared antibody detected most southern isolates but was poor in detecting northern isolates. In I-TPIA the best results were obtained with Agritest lgG. Fast red was superior to NBT-BCIP. Citrus plantations in five provinces in southern Iran (Fars, Kohgiluyeh-Boyerahmad, Hormozgan, Sistan-Baluchistan and Kerman) were surveyed for the presence of CTV using I-TPIA and an lgG preparation to Italian isolate of the virus (Agritest). Samples of 2-year old twigs were taken from Ca. 4000 randomly selected trees in March 2004. One young stem and four petiole prints from each tree were processed using fast red method. CTV was detected in various citrus cultivars and all citrus growing regions. The highest rate of infection was found in sweet orange followed in decreasing order by local mandarin, sweet lime and lime. The results of this experiment show that CTV is present in all southern provinces of Iran despite prevailing high temperatures, but no severe strain of this virus was detected in these regions. In contrast northern isolates recently introduced from Japan included severe CTV strain which showed positive reaction to MCA13 IgG.

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MaryLou Polek

Central California Tristeza Eradication Agency

SPRING, 2007: It is a pleasure to report that nothing out of the ordinary has occurred within the last year, a sign of a successful suppression program. The Agency is completing the fifth year of its Five-Year Subsampling Program. Starting in the fall of 2007, sample collection cycles back to the properties surveyed in 2002. The overall level of infection for the districts participating in the mandatory tree removal program is 0. 094%, a decrease from 0.120% in 2002. (Yes folks, those zeros ARE in the right place! How many of you are jealous?!)

The question now is how do we approach the next 5-year subsampling cycle? Financial resources are limited while operational costs have increased significantly. The Program's Technical Advisory Committee met and with the assistance of Tim Gottwald, has developed a risk-based operational program. The Agency will continue subsampling all commercial acreage within a five-year period but will decrease the number of samples collected by assigning a "threat priority" to each grove. The greater the potential threat, the higher the probability that grove will be selected for collection. Therefore, not every grove will be surveyed. We realize the increased risk of doing this, but because in many areas there is no or extremely low infection, the level of risk is acceptable.

The long-term plans for the Agency will most likely include expanding survey and detection beyond tristeza. There are no definite changes to report at present. Staff continue to biocharacterize California CTV isolates on a small scale. Additional information regarding the biological reactions of these isolates can be found on the Agency's web site at www.cctea.org.

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Peggy Sieburth and Michael Kesinger

Florida Bureau of Citrus Budwood Registration

The new requirements for greenhouse structures for nursery propagations and budwood source trees became effective January 1, 2007. The duties of inspection of citrus nurseries has been delegated to the Florida Citrus Health Response Inspectors in the Bureau of Plant Inspection, who are responsible for inspecting the structures for integrity and plants for health. This highly trained and dedicated team of five inspectors has been very busy in the inspecting, recommending correction of deficient areas and finally approval of the new enclosed structures. Approximately 40 commercial citrus nurseries decided to stay in business and built the required structures. Twenty nurseries have also erected structures to house their budwood scion source trees. Most of the commercial nurseries have opted to remain in their current location in the citrus belt, but several nurseries have moved north of the commercial citrus belt and away from commercial citrus. Any newly established citrus nursery has to be at least one-mile away from commercial citrus groves.

The new budwood Foundation facility is being built in Chiefland in Levy County in the center of the state (see inset). It is required by law to be 10 miles away from commercial citrus. This facility will house foundation trees of every clonal selection utilized in Florida. A large section of the new greenhouse will be dedicated to increase blocks to have the capacity for the distribution of larger quantities of budwood to Florida nurserymen. During the current budwood shortage, only registered Florida citrus nurserymen can receive budwood; no budwood will be sent out of state or to Florida homeowners.

A second Germplasm repository will also house the Florida Citrus Germplasm Introduction Program. It is planned to be built in Santa Fe, still in the center of the state, but further north in Alachua county (see below).

The demands for testing the budwood source trees has increased considerably. We are in the process of adding two additional personnel to increase the budwood laboratory staff to five. We will need this staff for testing all foundation and scion trees yearly for HLB and CTV. The first HLB tests of Florida scion source trees has been completed with no infections found.

Beatriz Stein

Citrus Sanitation Center of the Estacion Experimental Agroindustrial Obispo Colombres (EEAOC), Tucumán, Argentina

November last year we planted the first citrus plants of the Foundation block in the experimental field of the EEAOC. These plants were obtained by shoot tip grafting and after the biological, molecular and serological indexing were found free of psorosis and tristeza viruses and exocortis and cachexia viroids. Another activity of the center that was performed for the second year as a service to citrus commercial nurseries is indexing for psorosis in rootstocks seed source trees. In June, 2006 during a meeting with citrus nurserymen, the certificates with the results of psorosis indexing were distributed and the first certificate was given to Dr. Jose Luis Foguet an emeritus researcher with the EEAOC who strongly believed in and supported the importance of a citrus sanitation center for the citrus industry of northwestern Argentina.

This season we received from citrus companies joined in AFINOA (Phytosanitary Association of Northwestern Argentina) a new greenhouse for indexing as a contribution (see pictures below).

Greening (HLB)

EEAOC started a project for surveying for Huanglongbing (greening disease) and its vector *Diaphorina citri* in the northwestern region of Argentina. The development of an effective control strategy for this disease is based on early pathogen detection.

Since the end of 2005 *D. citri* and its natural enemies are being monitored with traps during citrus flushes. As a results of this action *D. citri* and its parasitoid *Tamarixia radiata* were detected for the first time during March and April, 2006 in Salta and Jujuy provinces.

The use of duplex and simple PCR with high capacity for detecting the HLB bacteria in both in plants and psyllids were adjusted. This technique was performed on *D.citri* detected in Salta and Jujuy provinces and the results were negative for the disease.

Field workers and technicians are trained by our researchers on recognition of the greening disease and the identification of the insect vector. Up to now, more than 500 people from 46 citrus companies were trained and a field ID guide is distributed to them.

Inside the new facilities at Tucuman, Argentina

Fresh Citrus Fruits

SECOND EDITION

Edited by Wilfred F. Wardowski,

William M. Miller, David J. Hall, and

William Grierson

Longboat Key, Fl.: Florida Science Source, 2006. Hardcover, 602 pp, 26 color plates. ISBN 0-944961-08-8. $80 + $3 shipping. Available from www.ultimatecitrus.com/fssource/index.html.

Review by David Karp

"The Green Bible" for packers and growers, this book calls itself. What do those guys in Florida know about fresh citrus fruits, you ask? Florida may be the 800-pound gorilla of processed citrus, but California produced 68 percent of the domestic fresh citrus crop in the 2005–6 year, and Florida only a modest 23 percent; processing accounted for 90 percent of the Sunshine State's tonnage. Sadly, two serious diseases, canker and greening, now are endemic in Florida, and the U.S. Department of Agriculture doesn't allow Florida fresh citrus to be shipped to other major citrus-growing states. Nevertheless, Florida still sells a lot of table citrus, and is the largest producer of fresh grapefruits and mandarins, so its industry has developed abundant expertise.

Florida specialists predominate among the 40 contributors to *Fresh Citrus Fruits,* but there are also a few from California, and an all-star foreign contingent. Will Wardowski, the lead editor of both the original version and this second edition of this book, came to know many of these experts, as well as citrus scientists worldwide, in a distinguished career with the University of Florida's Citrus Research and Education Center in Lake Alfred. After retiring a few years ago, he has continued to maintain Florida Science Source, a publisher and bookseller, as the best source for books on citrus. Most notably, it's the United States distributor for James Saunt's *Citrus Varieties of the World,* a truly indispensable tome for citrus lovers. *Fresh Citrus Fruits* falls into a some what different category, being intended primarily for citrus packers, growers and students, so many of the 21 chapters cover industry-related topics such as maturity and grade standards, transportation to the packinghouse, and degreening, etc. Many of these chapters have been substantially revised since the first edition appeared in 1986, and 26 color plates, mostly illustrating citrus fruit diseases and disorders, have been added. Two new chapters, on Food Safety Programs, and Organic Fresh Fruit, also appear. The book, nicely bound and printed, offers a wealth of information that will be of interest for small producers, back

yard growers and even consumers, if they're citrus enthusiasts. Particularly fascinating are the sections surveying citrus production in individual countries, including China, Japan, Spain, Israel and South Africa. Ever wonder what kind of mandarins China produces, or where limes are grown in Mexico? These chapters, each by authoritative specialists, provide information not easily available elsewhere. My only regret is that the new edition no longer has a section on Brazil, the world's leading citrus producer. Small growers might be interested in the chapter on Production Practices that Influence Fresh Fruit Quality, which summarizes a huge amount of information about climate, rootstocks, fertilization, irrigation etc.

The first edition, published by AVI, has long been out of print and hard to find; it does have some material not in the second edition, so if you have a copy, don't give it up when you buy the new edition.

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Zhao Xueyuan - China

On the definition and history of the name huanglongbing

In 2006, I had attended the Huanglongbing-greening International Workshop in Brazil and presented 2 papers on huanglongbing and its control in China. Since the English name yellow dragon disease for huanglongbing has been used in some papers presented in 2nd Int. Citrus Canker-HLB Research Workshop, I had explained the meaning of huanglongbing in the presentation in Brazil.

In last century, the serious damage caused by HLB was firstly found in Chaoshan, Guangdong. In Chaoshan, the farmers called the disease with local tongue as "En-len". The meaning of "En-len" is yellow shoot. In the scientific paper published by Chen Qibao in 1943, the meaning, "En" was transferred to "huang", The Chinese character "huang" means yellow, and "len" was transferred to "long". The Chinese character "long" means dragon.

This paper confirmed the graft transmissibility of huanglongbing published by Prof. Lin in 1956 and had attached an English abstract with the title "Etiological studies of yellow shoot of citrus". In 1960, Prof. Lin published several papers on his huanglongbing research and used the disease name as huanglongbing which directly means yellow shoot disease. In the 1981 ISC Conference in Tokyo, I had presented a paper with the title: Citrus yellow shoot disease (Huanglongbing) in China.

Therefore, according to the above information, the English name "yellow shoot disease" is suitable for huanglongbing, but not "yellow dragon disease".

From Chet Roistacher

In March and April, 2007, Chet taught his 21st year at the Istituto Agronomico Mediterraneo in Bari, Italy to a class of 15 students from various countries of the Middle East. It is always a pleasure for him to return to his "Italian family" and retrieve the many memories of people and places associated with this region, this Institution and also the University at Bari. Below is a picture of Chet and his class of 2007.

In 2007, Chet had upgraded over 30 of the 63 slide shows in EcoPort. To access all of the slide shows pertaining to citrus and citrus diseases click on this link:

http://ecoport.org/ep?SearchType=domainContents&id=9&type=group

See also the following reference:

Roistacher, C.N., R.F. Lee, C.A.J. Putter and R.C.J. Putter. 2005. EcoPort slide shows on the internet related to citrus and citrus diseases. Proc. 16th Conf. IOCV, 473-477. IOCV, Riverside, CA.

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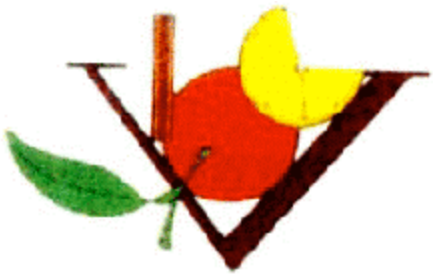

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INVOICE

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12	__	35.00	3.00	38.00	35.00	15.00	50.00
13	__	40.00	3.00	43.00	40.00	15.00	55.00
14	__	40.00	3.00	43.00	40.00	15.00	55.00
15	__	40.00	3.00	43.00	40.00	15.00	55.00
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Membership form 04-07

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