

INTERNATIONAL ORGANIZATION OF CITRUS VIROLOGISTS

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IOCV NEWSLETTER (Supplement)

November, 2006

This special supplement on the International Workshop on HLB was submitted by Prof. Josy Bove. All illustrations are those of Bove.

From Fundecitrus,
Araraquara, São Paulo State, Brasil

International Workshop on Huanglongbing

Ribeirão Preto, São Paulo State, Brasil.
July 16 to 20, 2006

Huanglongbing (HLB) was reported from São Paulo State (S.P.), Brasil, in March 2004, and from Florida, U.S.A., in August 2005. As HLB is probably the worst disease that can affect most citrus species, regardless of rootstocks, two international workshops have been devoted to HLB in less than one year: a joined Citrus Canker – Huanglongbing research workshop in Orlando, Florida, U.S.A., (November 7-11, 2005) and an International Huanglongbing Workshop in Ribeirão Preto, S.P., Brasil (July 126-20, 2006).

The Paulista HLB workshop was organized by members of the following scientific institutions: “Sylvio Moreira” Citrus Research Center (Cordeiropolis, S.P.), ESALQ/USP (Piracicaba, S.P.); Fundecitrus (Araraquara, S.P.), INRA (Bordeaux, France) and Instituto Biológico (São Paulo city, S.P.). Participants came from 17 countries; 200 were from Brasil, 54 from other countries. Invited speakers were from Brasil, China, France, South Africa, and the U.S.A. The following topics were covered:

- HLB in the world;
- Species of *Candidatus Liberibacter*
- *Diaphorina citri* and Transmission
- Epidemiology and Damage
- Management of HLB in China, South Africa, Brasil, and the U.S.A
- Management of HLB in various Citrus farms in S.P.;
- Campaign for HLB control in São Paulo State and Florida.

These topics were covered by 33 oral presentations and 40 posters. In addition, two discussion panels were organized. One dealt with *Candidatus Liberibacter* and involved characterization, taxonomy, variability, diagnosis, sampling, and inoculum reduction. The other covered *Diaphorina citri* bioecology, monitoring and control.

A whole day field tour allowed the participants to become acquainted with HLB leaf and fruit symptoms: the characteristic leaf blotchy mottle, and the small, asymmetric fruits

with colour inversion and brownish/black aborted seeds. Symptoms of the following diseases could also be seen and compared with those of HLB: phytophthora gummosis and footrot, citrus variegated chlorosis, leprosis, and rubelose. The participants were also shown how to carry out the surveys for spotting trees with HLB symptoms, and how to get rid of such trees by cutting them down and literally grinding them up.

Regarding control of HLB in São Paulo State, there was a large consensus that insecticide treatments were effective in controlling *Diaphorina citri* populations. Also, at the early stages of the disease, at least 4 surveys per year are required to detect symptomatic trees, and that such trees have to be pulled out as quickly as possible after having been identified. For large, adult trees, identification is based not only on inspecting the trees from the ground, but also on the use of tractor-carried platforms allowing the tops of the trees to be examined (see photo). With these management methods, it seems that in São Paulo State, the number of HLB-affected trees decreases when these methods are applied rigorously in the large citrus farms, and that HLB control can be effective. Under Florida conditions, it seems as if the same management system might be less effective.

Among the many results from the workshop, it might be worthwhile to mention that it has now been demonstrated that *Diaphorina citri*, already known to be vector of *Ca Liberibacter asiaticus*, is also vector of *Ca Liberibacter americanus*. In addition, it has now been shown that the ornamental rutaceous plant, *Murraya paniculata*, well-known in São Paulo State and in Florida, is not only the preferred host of *Diaphorina citri*, but can host also either one of the two liberibacters, “asiaticus” and/or “americanus”. Thus *M. paniculata* appears as a HLB reservoir for both the vector and the pathogens.

The book of abstracts of the S.P. workshop is available from Fundecitrus, 201, Av. Dr. Adhemar Pereira de Barros, Vila Melhado, Cx.Postal, 391. Araraquara, S.P., Brasil.





Characteristic blotchy mottle on sweet orange leaves



Inverse coloration (stylar end greening)



Seed abortion



Platform to examine top of trees for HLB symptoms. A Lady participant climbing the platform.



Symptomatic trees are cut down.

Trees are bulldozed

(Below) A section of the trunk is treated with glyphosate to kill the roots and prevent the development of shoots from roots.



Branches and shoots are ground up.

Resets



Final Farewell for John Moll



We received word that John Moll, South Africa, recently passed away. John was the Head of the Plant Pathology Section, Citrus and Subtropical Fruit Institute, Nelspruit, South Africa for many years before taking employment with Crook Bros. Limited, one of the largest citrus companies in South Africa. John did microscopy to demonstrate the multiplication of the greening bacterium in the psyllid vector, *Trioza erytreae*, and was the first to use dodder to transmit greening to periwinkle. Many IOCV members will have good memories of the tristeza tour in South Africa organized by John Moll in 1985. Among other interests, John was an avid fisherman. We will miss him.



100th Anniversary Symposium

**Citrus Research Center and Agricultural Experiment Station
University of California, Riverside**

Centennial Banquet

February 14, 2007

Riverside Convention Center

Cost: \$75

3:00 p.m. Poster session set up*

4:00 p.m. – **Welcome Reception** & Wine Tasting / Historical Photos &
6:15 p.m. Citrus Labels

6:30 p.m. – **Banquet and Centennial Program**
9:00 p.m. Master of Ceremonies: Huell Howser (KCET-TV)

Centennial Symposium

February 15, 2007

Riverside Convention Center

Cost: \$100

Agricultural Sustainability and New Technologies –The Next 100 Years

7:30 a.m. Registration & Continental Breakfast
Poster session open*

8:00 a.m. Welcome & History

Dr. Steven R. Angle—Dean, College of Natural & Agricultural Sciences, UCR

Dr. Charles Coggins—Emeritus Professor of Plant Physiology, UCR

8:30 a.m. Featured Speaker: **Dr. Lowell Catlett**, Economist, Futurist, Regent's Professor, and Dean, College of Agriculture and Economics, New Mexico State University

"Tomorrow's Agriculture: Six Trends You Can't Afford to Miss"

9:30 a.m. *"Agricultural Sustainability and Pest Management"*

Dr. Thomas Tomich, Director, Agricultural Sustainability Institute, UC Davis, and the statewide UC Agriculture and Natural Resources' Sustainable Agriculture Research and Education Program (SAREP); W.K. Kellogg Chair in Sustainable Food Systems, UC Davis

10:15 a.m. Break; poster session open*

10:45 a.m. *"Agricultural Biotechnology"*

Dr. Roger Beachy, Professor of Biology and President of Donald Danforth Plant Science Center, Washington University in St. Louis

11:30 p.m. Lunch; poster session open*

1:30 pm. *"Natural Resources, Environment, and Water Sustainability"*

Dr. Rudolph Wu, Director of the Centre for Coastal Pollution and Conservation, and Chair, Department of Biology & Chemistry, City University of Hong Kong

2:15 p.m. Panel Discussion - Corporate and Industry Leaders
"Technology Transfer and Commercialization"

Ted Batkin, President, Citrus Research Board

Dr. Agenor Mafra-Neto, CEO & President, ISCA Technologies, Inc., Riverside, CA
Dr. Larry Grill, Senior VP for Research and Chief Scientific Officer, Large Scale Biology
Dr. Ben Faber, Farm Advisor, Ventura County
Dr. Anne Chase, Owner, Chase Research Gardens, and Pest Control Consultant

3:00 p.m. Wrap-up; poster session open for presentation*

***Guidelines for Poster Presentations:**

Send: Title, abstract, authors' names, authors' affiliation with complete mailing addresses, telephones, and fax numbers, and the e-mail address of the presenting author, to arrive no later than January 29, 2007, to seymour.vangundy@ucr.edu. If a letter of invitation is needed, please indicate so when submitting the poster abstract. Late submissions may not be accepted.

Please forward the announcement to anyone who may be interested. Posters and invited and encouraged.