

Development of New Technologies for the Control of Citrus Huanglongbing (HLB) in Southeast Asia (2004 - 2008)

Citrus HLB, or citrus greening disease, is seriously threatening the productivity of citrus trees in tropical and subtropical regions in East and Southeast Asia. "Huanglongbing" is the Chinese name for this, which means "yellow dragon disease." The yellowed leaves of severely affected trees have provided the basis for this particular appellation (Fig. 1). The term "greening," on the other hand, originates from the color of the infected fruits. Instead of becoming orange when ripe, fruits of affected trees remain green. Recently, the disease has been spreading in temperate regions, presumably under the influence of global warming. In 2003, the disease was also detected in the Ryukyu Islands belonging to Okinawa and Kagoshima Prefectures, areas which are located very close to the main citrus production regions of Japan (See JIRCAS Newsletter No.36 p.4).

Citrus HLB is transmitted by an insect vector, the Asian citrus psyllid, *Diaphorina citri* (Fig. 2). HLB-free trees are easily infected through the sucking of young shoots by these viruliferous vectors. It is therefore essential that we develop technologies to control vectors through investigation of psyllid ecology. In order to implement research aimed at the development of disease-prevention technology, JIRCAS has initiated a five-year project starting from April, 2004, in collaboration with Vietnam's Southern Fruit Research Institute (SOFRI) and France's Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD), as well as with other Japanese national and prefectural agricultural research institutes that are currently investigating the domestic problems of the disease.

The main purpose of the project is to evaluate each of

the available physical, chemical and biological control methods that reduces the likelihood of transmission of HLB disease in healthy trees of newly-planted citrus orchards. Development of monitoring techniques and analysis of dispersal modes of citrus psyllids in the field, measuring the probability of bacterial transmission through these vectors, survey of natural enemies such as parasitoids in the fields in Vietnam and evaluation of their effectiveness under field conditions, analysis of bacterial multiplication and symptom development and discovery of increasingly efficient diagnostic methods for the pathogenic bacteria are being undertaken. Simultaneously, assessment of the potential influence of citrus rootstocks on disease expression in sweet lime, evaluation of the economic impact of HLB in farm management and mapping of HLB and psyllid occurrence for risk assessment are also major topics that will be covered through research in Vietnam.

After thorough evaluation of different control methods, these can then be integrated in a follow-up project to establish comprehensive prevention technology applicable for use in citrus orchards. Along these lines, JIRCAS will strive to achieve the overall goals of the current project, which seeks to apply practical disease-control methods in Southeast Asian citrus orchards where HLB is endemic, and to disseminate useful scientific information to the responsible local research scientists and administrators, thus enabling them to provide agriculturists with appropriate guidance on disease control.

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Fig. 1. Citrus plants showing symptoms of HLB.



Fig. 2. *Diaphorina citri*, the insect vector of Citrus HLB (body length: 3 mm).

Launching of JIRCAS' Southeast Asian Office

JIRCAS opened its Southeast Asian Office at the premises of the Department of Agriculture, Thai Ministry of Agriculture and Cooperatives in Bangkok, Thailand on December 1, 2004 and held an opening ceremony well-attended by various guests last December 2 (please see cover picture). The former office has served as a base camp for JIRCAS researchers working in Thailand for more than 30 years. But the Southeast Asian Region has intensified the integration of socio-economic activities including agriculture, and we should not only work more competitively but also handle many development issues through a regional and/or multilateral, rather than a bilateral framework. Therefore, the new office will serve as a common platform for every partner involved in agricultural research for advancement of the region and act as initiator and coordinator for implementing new collaborative research projects, using both our own resources and external ones. The new office welcomes every stakeholder in the region, and we hope that it will give you and ourselves, an opportunity to exchange ideas and work more closely.

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