

**To:** USDA Forest Service-International Activity Team

**From:** Yun Wu, Plant Pathologist, USDA Forest Service / Forest Health Technology Enterprise Team, 180 Canfield Street, Morgantown, WV 26505, Phone: 304-285-1594, Fax: 304-285-1564, E-mail: ywu@fs.fed.us

**Subject:** Yu Wu's China Trip (April 19, 2005 to June 18 2005)

The objectives of this trip were: to monitor the technical progress on several international biological control cooperative projects and to finalize several publications on invasive species and biological control (*Parasites and Predators of Forest Pests of China*, *Forest Diseases of China*; and 2<sup>nd</sup> volume of *Invasive Plant Species Established in the United States and Their Natural Enemies of Asian Origin*).

(See attached proposal).

I was stationed in Beijing, except a day trip to Tianjin Emerald Ash Borer site on 5/13; two one-day trips and a three-day trip to Hebei Province for transplanting plants related to mile-a-minute weed; and a two-day trip to Chongqing, Southwestern China for mile-a-minute weed pathogen collection.

#### **Invasive Plants Biological Control Projects:**

1. Host range testing for selective pathogenic fungi of mile-a-minute weed

Infected and dying Mile-a-minute weed plants were found in the field in Southeastern China. Several fungal species were isolated and tested in the greenhouse and laboratory on detached leaves and on whole plants of mile-a-minute weed and on closely related plants including several cultivars of buckwheat, Rhubarb (for vegetable and for medicinal), *Rumex*, *Polygonum* spp. and crops that related to the specific fungal species/isolates. One of the isolates caused rapid death of mile-a-minute weed in the field in Chongqing, and isolates collected in August 2003, but it was difficult to culture on the media.

2. Biological control of Tree of heaven using pathogenic fungi and weevils

The cooperative project is with the Institute of Environment & Sustainable Development in Agriculture (IEDA) (formerly Institute of Biological Control-IBC), Chinese Academy of Agricultural Sciences (CAAS), P.R. China, with insect work located in Yangzhou, Anhui province by Prof. Du Yuzhou, and the pathogenic work within the IBC in Beijing. Two weevils considered as severe pests for Tree of heaven street trees were studied. Several shipments of the weevils were sent to the quarantine laboratory in Virginia Tech for rearing and host range tests by Scott Salom.

The pathogen work under my direction is being conducted by Fu Weidong at the IEDA. A total of 6 Provinces were surveyed and 85 isolates collected. Pathogenicity tests are on going in the greenhouse using Tree of heaven seedlings established in the greenhouse. Future work will focus on establishing a network of cooperators to regularly survey in the locations recorded with rust fungi.

### 3. Biological Control of Kudzu using an imitation rust (*Synchytrium minutum*)

This effort was initiated previously by Kerry Britton in cooperation with Sun Jianhua, and Jiang Zide. Last year when I visited China in July, I collected the imitation rust infected Kudzu plants and established them in the greenhouse at the IEDA. I plan to continue working on this project in 2006 with emphasis on biology, ecology and host range testing through cooperation with the IEDA and The Southern Agricultural University.

Previous work found Kudzu plants infected with the imitation rust in Guangzhou, and in An Hui. The impact of the rust on xylem system has been determined. It is very important to determine the host range of this pathogen as a lot of plants that are closely related to Kudzu are crops (e.g., soybean).

### **Invasive Species and Biological Control Publications**

#### 1. *Invasive Plants of Asian Origin Established in the United States and Their Natural Enemies*, Vol 2;

Numerous authors are involved in completing this publication. My effort on this trip was focused on meeting some that are deadlines were not. Several meetings were held to solve the problems that had been the berries for meeting the deadline, and an intern student was hired to help on literature search, scientific name corrections. A draft of all species was completed by the time I left for the USA (6/18/05).

#### 2) Forest Diseases of China;

The progress on this publication is progressing as planned. All Chinese manuscripts are complete and submitted to the editorial board during this meeting in Xian in May 13<sup>th</sup> -15<sup>th</sup>. Problems were identified and all of the corrected Chinese manuscripts should be complete by 31 October 2005. Both Chinese and English versions of the book should be printed by 30 December 2006.

#### 3) Parasites and Predators of Forest Pests in China;

This is the first joint publication by the Forest Service and the Chinese Forestry Publishing House. Both Chinese and English manuscripts will be complete by September 2005. My duty is to complete the cooperation of the images of and review the English version. A complete English manuscript with the images was sent back to the USA in May for review.

### **EAB Work**

On 5/13, Dick Reardon and I accompanied by Dr. Yang Zhongqi, Sun Jianhua, and Wei Xia, wen to Tianjin to see the study sites and the progress for EAB life history and EAB biological control.

**Proposal:**

**Request for International Activities:**

**Name:** Yun Wu, USDA Forest Service-FHTET

**Purpose:**

Monitoring on progress on international cooperative projects: Invasive species (emerald ash borer, mile-a-minute weed, tree of heaven); English publications of Forest Diseases of China, Forest Insects of China, Parasites and Predators of Forest Pests of China; and 2<sup>nd</sup> volume of Invasive Plant Species Established in the United States and Their Natural Enemies of Asian Origin.

**Approximate dates:** 60 days in mid March through mid May

**Description:**

1. Host range testing for selective mile-a-minute weed pathogens
2. Project progress monitoring on 1) Tree of heaven biological control; 2) Forest Diseases of China; 3) Forest Insects of China; 4) final editing and printing of Parasites and predators of forest pests in China; 5) 2<sup>nd</sup> volume of Invasive Plant Species Established in the United States and Their Natural Enemies of Asian Origin; 6) EAB life history; 7) EAB biological control.

**Estimated cost:** \$5,000 (for 30days)

**FHP FHTET:** Pay for other 30 days.

**Supervisor Approval:**