

**TRIP REPORT (IAT) – SOUTH KOREA**  
**September 20 – September 27, 2008**

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**Objectives:** (1) Participate in IUFRO Working Party 2.02.15 Conference (as Deputy Coordinator for Working Party, and in oral and poster presentations), (2) become more familiar with white pine blister rust impacts and management in South Korea, and (3) discuss a recently started cooperative white pine blister rust resistance project with Dr. Kwan-Soo Woo.

**Background:** All nine species of 5-needle pines in the U.S. are susceptible to white pine blister rust, and high levels of mortality have occurred in several of these species. Since the 2001 conference in Medford, Oregon, the IUFRO Working Party 2.02.15 (Breeding and Genetic Resources of Five-Needle Pines) has been the lead conduit for information on blister rust and its impacts on five needle pines around the world. The last meeting was in 2006 in Romania and provided highlights on blister rust resistance and five-needle pine work there. Like the U.S., Canada, and China, S. Korea has had a problem for decades with white pine blister rust infecting their native pine species (this is ‘new’ information to many researchers in North America). The conference in South Korea provided the opportunity to meet with geneticists and pathologists who have been active in five-needle pine and blister rust management in Korea. Prior to the meeting, I was asked by the one of the invited speakers (Dr. Y.J. La) to review his abstract on ‘Korean effort to control blister rust of Korean Pine’. In addition, several years ago, a blister rust resistance project was initiated with Dr. Kwan-Soo Woo of the Korean Forest Research Institute (KFRI), and this trip provided a chance to visit with Dr. Woo at the early stage of the project.

1) **IUFRO 2.02.15 Conference:** The conference and field trips were excellent. KFRI did a great job on local arrangements, and many of their researchers from the institute attended the meeting. The main portion of the meeting was held in Yangyang. Countries represented at the meeting included: China, S. Korea, Japan, Thailand, Vietnam, Romania, Bulgaria, Russia, Canada, Mexico and United States. A listing of oral presentations and participants is available at <http://iufro.kfrigene.net/>. In addition to the oral presentations, there was a poster session (two of the oral presentations and two of the posters involved Region 6 personnel). A ‘preceedings’ with abstracts was handed out at the meeting. A proceedings with abstract, extended abstracts and papers is planned. Local sponsors of the meeting included:

Korea Forest Research Institute  
<http://www.kfri.go.kr/eng/>

Korea Forest Service  
<http://english.forest.go.kr/>

The Society for Korean White Pine  
<http://koreanwhitepine.org/>

KFRI is a large institute with a strong Department of Forest Genetics and Division of Insect Pests and Diseases (<http://www.kfri.go.kr/eng/>). Under the new government there has been some serious discussion of 'privatizing' KFRI, and that would undoubtedly bring changes.

Much of South Korea is forested, but much of it was reforested following deforestation during WWII and the Korean War. Many of the plantations are single-species, including those of *P. koraiensis*. However, future reforestation will likely involve more diverse species mixes. Korea has three native species and one non-native species (*P. strobus*, Figure 1) of 5-needle pines, but *P. koraiensis* (Figure 2) is the most important for forestry and for the pine nuts it supplies. Blister rust, pine wood nematodes and climate change are all concerns in managing the 5-needle pines in Korea.



Figure 1. *Pinus strobus* seed source trial planted in 2002



**Figure 2.** *Pinus koraiensis* plantation

2) **Blister rust management in S. Korea.** Dr. La (Figure 3) gave an interesting presentation on this subject. Professor La was a Professor of Forest Pathology until his retirement in 1999 (now a Professor Emeritus at Seoul National University and consultant for the Plant Clinic of Seoul National University). Professor La has been actively involved in blister rust research and management in S. Korea for decades. Current management involves (a) eradication of the susceptible **Pedicularis** alternate host (*Pedicularis resupinata* rather than *Ribes* species is the major alternate host in S. Korea) and (b) removal of infected *P. koraiensis*. This is a continual process, but it has reduced blister rust from a major pest to currently a minor one. However, Professor La indicated that it is likely that these management activities will have to be continued on a frequent basis to keep the rust hazard low. It was interesting to observe an alternate model for dealing with blister rust, a model that would work under some conditions, but not likely in much of the western United States where extensive *Ribes* eradication was once tried.



Figure 3. Dr. La (forest pathologist) and Richard Sniezko

3) **Blister Rust Resistance of North American Species to Korean strain of Blister Rust:** The strain of blister rust present in S. Korea may be more virulent or aggressive than the strain of rust we have in North America. Testing some of our resistant seedlots against this strain of rust (or races of rust present elsewhere outside of North America) may provide us with information on how robust and durable the resistance in our native species is. Dr. Woo (Figure 4) is heading up this investigation (he did his Ph.D. work in the U.S. on blister rust resistance-related subject). We have sent him small quantities of 21 seedlots of four white pine species from the U.S. (*P. monticola*, *P. lambertiana*, *P. albicaulis*, and *P. strobiformis*). Most of the seedlots have been found to have varying levels of resistance in testing at Dorena GRC. Dr. Woo has also included a seedlot of *P. koraiensis* in the sowing. Germination of all seedlots was relatively low. Four to 47 seedlings per seedlot are currently available for the lots from the U.S. (except for one *P. lambertiana* lot that has no seedlings, Figure 5). Dr. Woo hopes to plant the seedlings out in an area where rust infection occurs (Note: due to the current success of the rust eradication program, this may be more difficult to locate than originally anticipated).



**Figure 4. Dr. Kwan-Soo Woo looking over seedlings of four U.S. white pine species**



**Figure 5. Richard Sniezko next to *P. strobiformis* for future blister rust testing**

The Korean trip was very successful. Contacts were renewed with some researchers and new ones made. First-hand knowledge emerged on the history of blister rust impacts and management in S. Korea. Contact was established with a pathologist in NE China with whom I am collaborating on a paper about blister rust impacts and management in China. The project initiated with Dr. Woo has promise but may need further inputs or follow-ups. Three researchers from RMRS (Ned Klopfenstein, Bryce Richardson and Anna Schoettle) also participated in the conference (Figure 6). The participants (Figure 7) at the conference are working on a wide array of 5-needle pines from around the world and would be good contacts for future cooperative work.



**Figure 6. Drs. Anna Schoettle, Ned Klopfenstein, and Bryce Richardson from RMRS, and Richard Sniezko (Dorena GRC)**

The next meeting of Working Party 2.02.15 is tentatively schedule for Tomsk, Russia in late summer 2010.



Figure 7. IUFRO 2.02.15 Working Party group photo (9/2008)

Some additional photos from the conference are available at [http://koreanwhitepine.org/gnuboard4/bbs/board.php?bo\\_table=iufro\\_kfrigene&page=9&page=1](http://koreanwhitepine.org/gnuboard4/bbs/board.php?bo_table=iufro_kfrigene&page=9&page=1)

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## **\*\*Update from the IUFRO 2006 meeting in Romania**

### **Proceedings publication**

The Symposium proceedings has been printed and published in the *Annals of Forest Research, Journal of Forestry and Environmental Sciences* (Vol. 51, 2008, 180 p.) of the Bucharest Forest Research & Management Institute. The proceedings can be ordered **free of charge** from Dr. Iovu Biris: [ecologie@icas.ro](mailto:ecologie@icas.ro); also, the proceedings can be downloaded from the following website: [www.e-afr.org](http://www.e-afr.org)

Selected papers from the symposium were published in a special issue of *Forest Genetics* 13 (1), 2008.