Progress Report on TACF China Project

March 23, 2010

Goal 1: To initiate an exchange of genetic materials and test blight resistance of backcross trees

a. **Seed collections**
   Seeds have been collected for all tree species (*C. seguinii, henryi, and mollisima*) from natural forests in Dalaoling, China during the fall of 2009. For each species, 10 sets of seeds (50 nuts in each set) have been collected and stored in a refrigerator (0-4°C).
b. **Establish a common garden at Dalaoling**
   An 858 m^2 (0.2 ac) plantation area has been leased with a 10-year term in the fall of 2009. The area is an abandoned agricultural land with an elevation of 1270m (4177ft). The plantation area has been cleared and tilted in December 2009.
c. **Import and export permits**
   We are trying to obtain import and export permits.

Goal 2: To understand the biogeographical tolerances and natural ecological niches of wild Chinese chestnut species and their stand development pattern

d. **Biogeographical tolerances**
   We have developed a range distribution for all major chestnut species with the collaboration from Peking University. We used global climatic data to calculate a set of bioclimatic variables such as mean annual precipitation and mean temperature of the coldest month (hardiness). We are analyzing corresponding bioclimatic factors for each species and comparing these factors among species.
e. **Tree core data collection**
   During the summer and winter of 2009, new cores were collected for *C. seguinii* (23 cores) and *C. henryi* (15 cores) on Dr. Shen's 2ha plot. No *C. mollissima* was collected due to the absence of this species on the plot. The cores have been mounted and sanded, and will be analyzed in spring, 2010. In addition, we have received tree core data of other 12 species (307 cores) on the same 2ha plot. The following is a list of number of cores by species.

Goal 3: To observe and analyze blight fungus in China

f. **Blight fungus study**

Blight fungus was surveyed in six sub-watersheds in Dalaoling during the fall of 2009. A total of 45 lesions were sampled from 25 blight infested trees. Infestations were classified based their severity using a ranking system from Liu et al. (2002) (Table 2). Blight funguses from the sampled lesions were cultivated, and we found 41 blight races (one from *C. mollissima*, 39 from *C. henryi*, and one from *C. sequinii*). These 41 races can be grouped into two groups based on the color of cultivated colony (white or yellow), or three groups based color change of the cultivation medium (no color change, light orange, or rosy red)

Table 1. The total number of cores by species collected in a chestnut stand in Dalaoling, China

Species	**No. of cores**
Dendrobenthamia japonica var. *chinensis*	28
Quercus aliena var. *acutiserrata*	44
Cyclobalanopsis myrsinaef	15
Fagus engleriana	25
Fagus lucida	28
Betula luminifera	28
Carpinus vininea	29
Acer amplum	3
Cerasus conradinae	31
Eurya brevistyla	19
Cornus controversa	22
Lithocarpus cleistocarpus	35
Castanea sequinii	23
Castanea henryi	15

Table 2. Blight infestation by species and severity.

Rank	**Description**	**No. of trees**		
		C. mollissima	*C. henryi*	*C. sequinii*
1	no symptom	-	-	-
2	vertical split without xylem exposure	-	10	1
3	vertical split < 30cm with xylem exposure, < 3 cankers	-	7	-
4	more than 3 cankers (30-100cm vertical split)	1	3	-
5	vertical split >100cm	-	3	-
6	dead	-	-	-
Total		**1**	**23**	**1**