GROWTH PERFORMANCE AND ADAPTABILITY OF *LIRIODENDRON TULIPIFERA* IN KOREA

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Generally, exotic species are used when the local indigenous forests cannot or do not produce the desire quantity and quality of forest products. Many regions such as Australia, New Zealand, India, Indonesia and the Middle East, use exotics much of time (Zobel and Talbert 1984). Breeding program for exotic tree species was started in 1924 in Korea. By 1945, total 370 tree species were introduced from 30 countries and tested. However, the plantation and test data were disappeared during Korean War. From 1958 to 1995, total 415 exotic tree species were re-introduced from 38 countries such regions as North America, Europe, Oceania and Asia. Yellow poplar (*Liriodendron tulipifera*) is one of them introduced into Korea at that period. Yellow poplar is naturally distributed most of the eastern USA and is an extremely versatile wood with a multitude of uses such as lumber for unexposed furniture parts and core stock, rotary-cut veneer for use as cross bands in construction of furniture pars, in plywood for backs and interior parts, and as pulpwood (Burns and Honkala 1990). Since 1970's, the growth performance and adaptability of yellow poplar has been tested in Korea. Here, we present the test results and would like to discuss the use of yellow poplar as a reforestation tree species in Korea.

Materials and Methods

To examine the growth performance and adaptability, yellow poplar was introduced from eastern USA in late 1960's and planted at six locations in 1970~1973 (Table 1). Each test stand was classified into three sites such as a good, moderate and poor depending on site index. At each site, three plots (20m x 20m) were set up and the all individuals within the plot were investigated. To compare the growth performance among test plantations, the volume growth of each plantation was standardized to the 28-year old data. The formula is: $E_{VG} = VG/Y \times 28$ where E_{VG} is estimated volume growth at age 28, VG is volume growth of each plantation and Y is the age of plantation. The growth data of *Larix kaempferi* and *Pinus strobus* at Chuncheon (II) and Wanju plantation was also investigated and standardized same method to compare the growth performance among tree species.

Table 1. Details of six test plantations of *L. tulipifera*.

Location	Planted year	Planting space (m)	Area (ha)	Aspect
Anyang, Gyeonggi	1971	4.0 x 4.0	0.5	W
Kwangneung, Gyeonggi	1973	1.8 x 1.8	1.0	E
Imsil, Cheongbuk	1970	1.8 x 1.8	1.0	NW
Wanju, Cheongbuk	1973	1.8 x 1.8	2.0	N
Chuncheon (I), Gangwon	1970	4.0 x 4.0	0.5	N
Chuncheon (II), Gangwon	1973	1.8 x 1.8	2.0	NW

Results and Discussion

The average volume growth per ha for all six plantations was 321m^3, which was similar to that of original habitat in the USA. This suggested that yellow poplar is well adapted to Korean environment. The growth performance of Wanju plantation showed the highest volume growth per ha among the six plantations. It was 4.8 times greater than that of Kwangneung, which showed the lowest volume growth. This difference was due mainly to better atmosphere humidity, soil humidity and depth and clay content. The growth of yellow poplar was nearly 2 times higher than that of *Larix kaempferi* and *Pinus strobus* at Chuncheon and Wanju, which were located even at 350~400m above sea level with steep slope and high ridge. The stem analysis of yellow poplar showed slow growth until the age of 15~20, but grew rapidly after then.

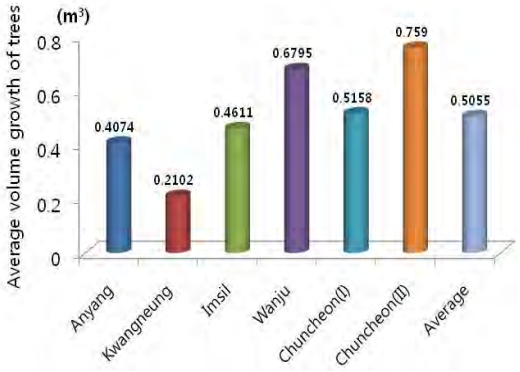

Figure 3. Volume growth of yellow poplar tree species at six different sites.

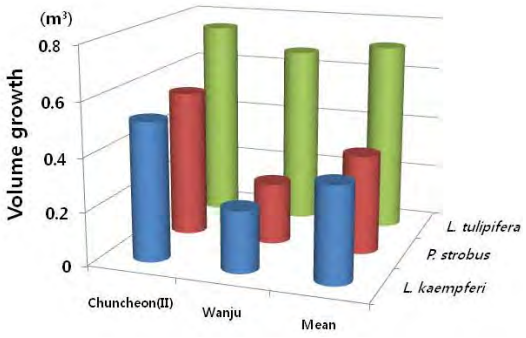

Figure 4. Volume growth of different in two plantations.

References Cited

Zobel, B. and J. Talbert. 1984. Applied Forest Tree Improvement. John Wiley & Sons, Inc. 505 p.

Burns, R. M. and B. H. Honkala. 1990. Silvics North America: Volume 2, Hardwoods. Agricultural Handbook 654. USDA, Forest Service, Washington, DC. 2877 p.