Valuable Broadleaves – Resources and Research in Lithuania

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1. Valuable Broadleaves in Lithuania

The country occupies western edge of East European plain, which is Part of the mixed forest-belt of middle climate forest zone. The relief is plane with small hills. Sod-podzolic forest soil prevails. The land's surface is above sea level average of 99m (35-292 m.). The area of forests is 19,877 km^2 what equals to 31% of the total country's territory (65,300 km^2).

Of the total forest area, 82% are semi-natural forests originating from natural regeneration and differ only little from the natural ones in terms of species composition. Natural and virgin forests with total area 22,000 ha, are still found in Lithuania.

Native tree species prevail in Lithuanian forests. The coniferous tree species share in the overall species composition is 58,2%, with pine dominating (36,2) and spruce second (21,8%). The share of noble hardwoods and wild fruit species is 4,5%. Broadleaved (41,8%) are represented mainly by birch (20,6%), black alder (6,6%), grey alder (6,3), and aspen (3,2%). Introduced exotic species such as *Larix* spp., *Pine* spp., *Quercus rubra* and other are grown in plantations, and cover less than 1% of the woodland area (Table 1).

Table 1 Forest stands area by dominant tree species

Dominant tree species	Area (ha)	Percentage (%)
Scots pine	719300	36,2
Norway spruce	432700	21,8
Other coniferous	3100	0,2
Birch	409900	20,6
Aspen	62900	3,2
Black alder	131800	6,6
Grey alder	125500	6,3
Oak	38600	1,9
Ash	48800	2,4
Other broadleaves	15100	0,8
Total	**1987700**	**100,0**

Transitory position between maritime and continental parts of Europe contribute to large ecosystem diversity. The forest classification routinely used in the forest management planning recognizes 72 forest sites and eighteen forest vegetation zones .The high forest represents 100%.

The share of forests has been increasing in the past 60 years due to natural conversion and re-afforestation of abandoned agricultural lands.

2. Research

The main reliable sources on forestry science and research in Lithuanian Forest Research Institute and Forest Faculty at Lithuanian University of Agriculture. The Faculty of Forestry at the university was established in 1924 and Forest Research Institute in 1951. They are the centres of preparation and publishing of special and scientific issues. The separate researches related to the forestry are carried out in the other environmental research institutes (Institutes of Botany, Ecology, etc.) and Universities participated in the common research programmes.

In accordance with the resolution confirmed by Government the main directions of activities are:

- forest ecosystem biodiversity and sustainability;
- forest productivity, protection, usage and economic problems;
- analysis on forest genetic resources, their conservation, enrichment and utilization.

The studies are carried out entirely in accordance with the Lithuanian forest policy towards the sustainable development of the forest management and objectives that are fixed in the Lithuanian programme on the development of the forest management and timber harvesting and timber processing. The main trends are:

- the woodedness extension;
- formation on the valuable, productive and resistant stands;
- the forest management efficiency for the sufficient profitable management and extension of the forestry;
- maintenance and conservation of the landscape and biological diversity;
- formation of the public opinion on the Lithuanian forests.

The Lithuanian Forest Research Institute carried out significant versatile research on the Growth of valuable broadleaved species in Lithuanian forests. Researches of Institute developed theory of stand formation, created the models of the most productive standard stand, fulfilled the studies on the forest soil types, successions, balance of mineral fertilizers, regulation of water regime in the boggy and marshland forests, forest gene pools, rational use and conservation of gene resources. An integrated system of forest protection against pests and diseases as well the forest protection measures against game animal damage were prepared. Scientific background for regional forest monitoring is created. The studies on industrial pollution of forests and regeneration of the forests declined by the reason of pollution are carried out.

The main scientific periodicals on forestry in Lithuanian are:

- "Baltic Forestry" (International scientific reviewed magazine on forest sciences issued by forest research institutes and universities of Lithuania, Latvia and Estonia twice per year);
- "Silviculture" (scientific reviewed issue edited by Lithuanian University of Agriculture and Lithuanian Forest Research Institute; twice per year);

Recent research

Recent research activities on valuable broadleaved tree species in Lithuania are:

Genetic variability, the adaptation levels and changes in the traits of *Quercus robur* L., *Alnus glutinosa* L. and *Betula pendula* Roth. as well as their regularity in the aspect of geography of origin and ontogenesis. Genetic heredity determination of the traits, plasticity of the phenotypes, genotypes and the particularity of the environmental interactions, and the possibilities for the genetic traits conservation in changing environment.

Ecogenetic variation of deciduous tree species and conservation of their genetic resources.

Silver birch (*Betula pendula* Roth.) and Downy birch (*Betula pubescens* Ehrh.) in Lithuania: ecology and productivity.

Ozone-induced foliage injuries on forest plants (*Alnus incana* L., *Salix caprea* L. and *Frangula alnus* Miller).

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