Breeding program for larch in Poland

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IBL, P19

workshop - Larch breeding

Hann Munden, March 25-26, 2009

Contents:

- Natural distribution – real occurrence in the forest
- Existing resources
- Provenance, progeny experiments
- Breeding
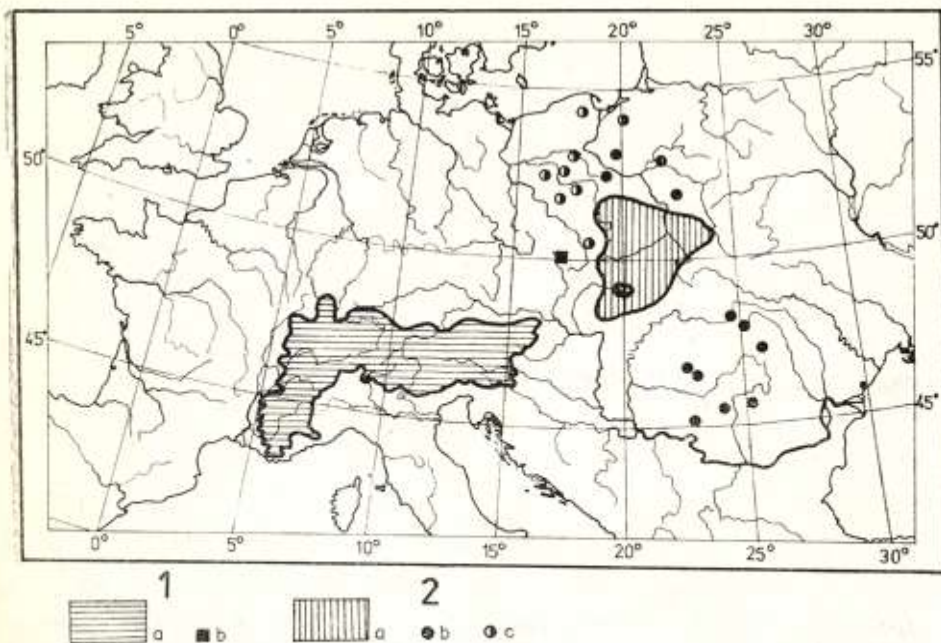- Problems
- Look into the future

Statistics

Types	No	Area [ha]
Seedling seed orchards	18	171
Seed orchards	37	166
Plus Trees	966	-
Plus seed stands	82	445
Temporary seed stands	-	1573

Statistics

- Larch is reported jointly with pine
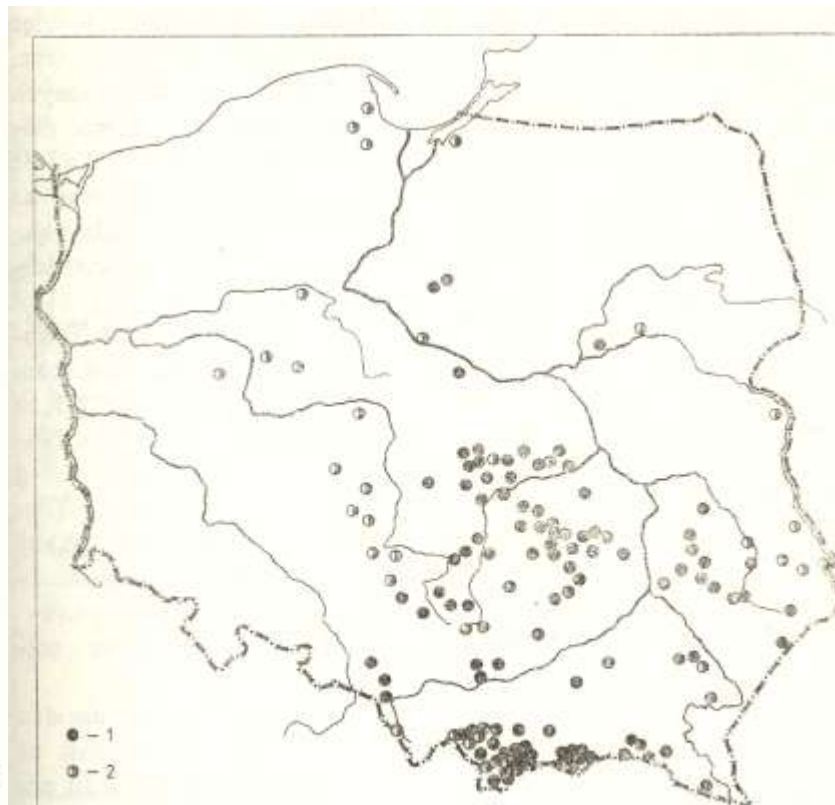- It is estimated to 146 070 ha (about 1%)
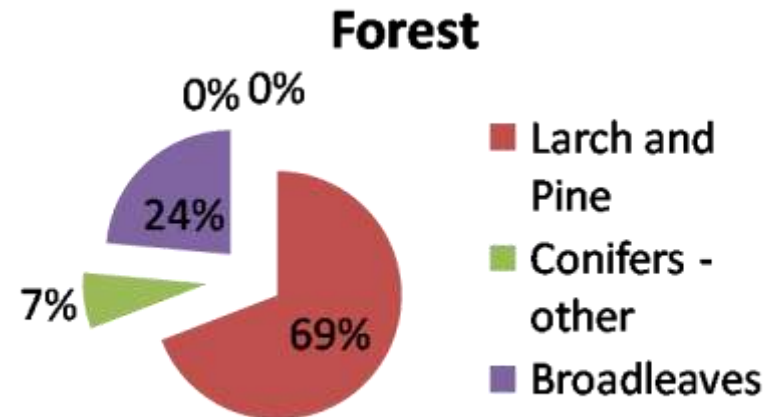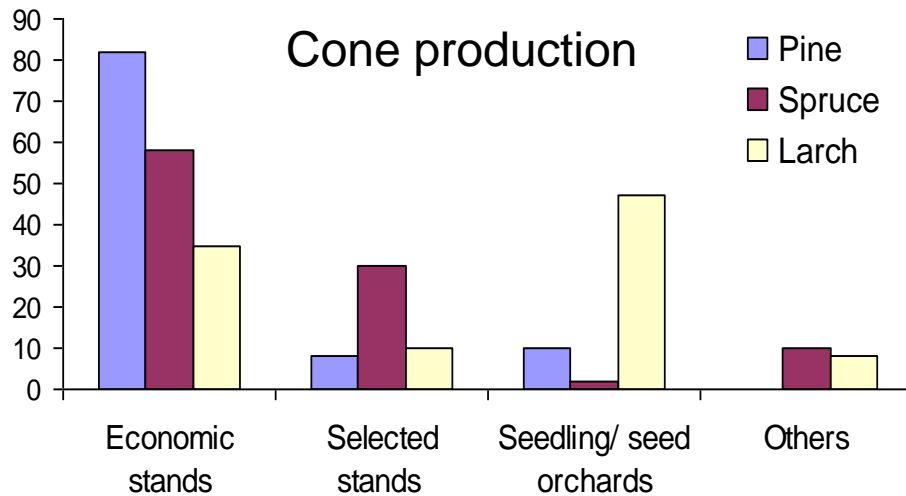
Larch natural distribution

Ryc. 13. Zasięg ogólny *L. decidua*

1 — subsp. *decidua*, *a* — zasięg zwarty, *b* — stanowiska oderwane; *2* — subsp. *polonica*, *a* — zasięg zwarty, *b* — naturalne stanowiska oderwane, *c* — stanowiska oderwane być może naturalne

Ryc. 18. Rozmieszczenie *L. decidua* subsp. *polonica* w Polsce

1 — stanowiska naturalne, udokumentowane historycznie, *2* — stanowiska przypuszczalnie naturalne

Seed zones

Research

- Provenance experiments
  - Lubawka 1932
  - Rogów 1949
  - Series IBL 1967 (4 plots)
- Progeny traials
  - Leszczydoł 1967 (21 families – Blizyn)
  - IBL 1987 (157 open pollinated families - from Blizyn region)
    - 1998 Kutno
    - 2000 Zwirzyniec
  - INRA (Sudeten larch), 2003 Zwierzyniec
- Combining production of improved seeds with genetic testing in seedling seed orchards

Lubawka
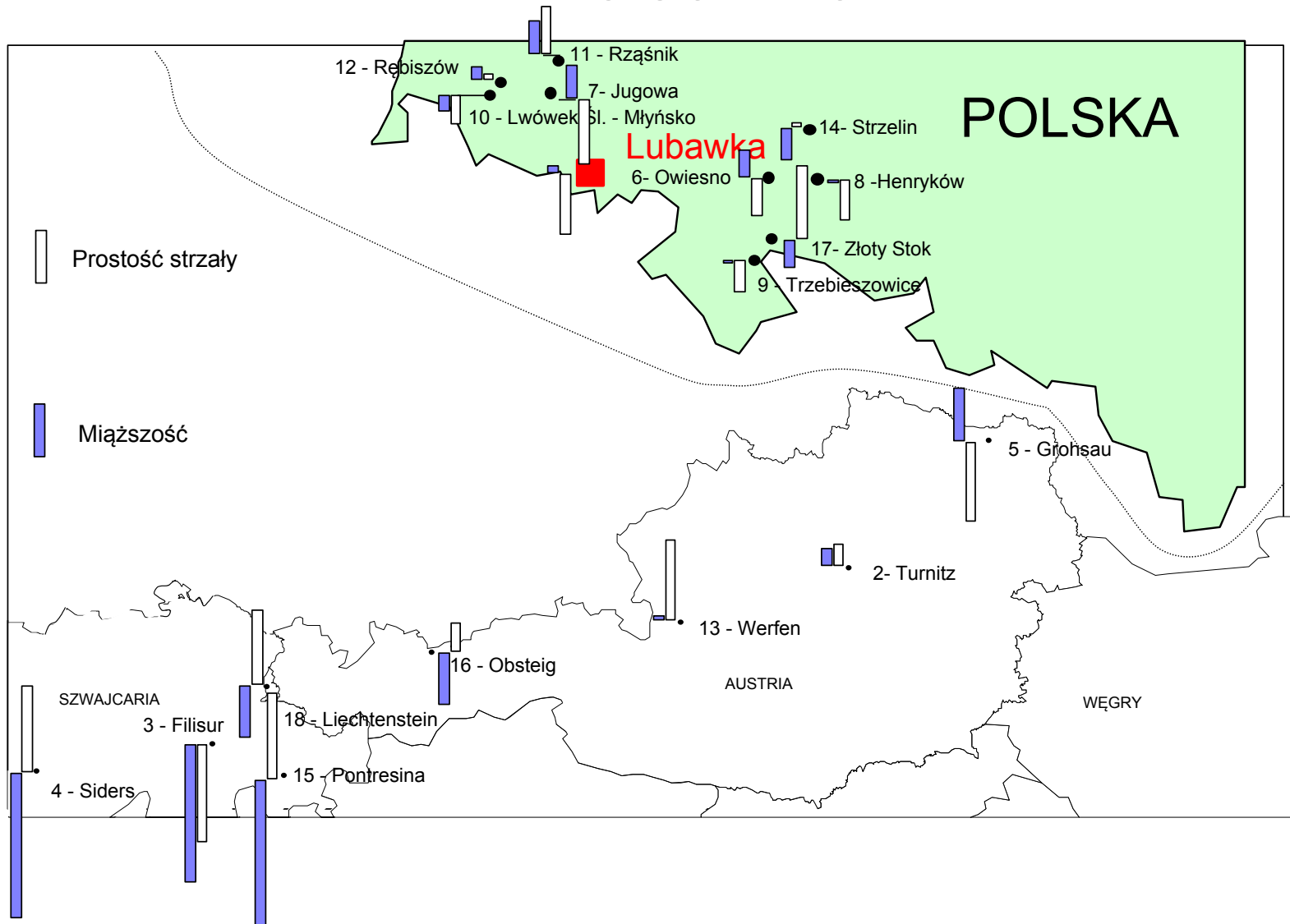
Larch IBL 1967 series
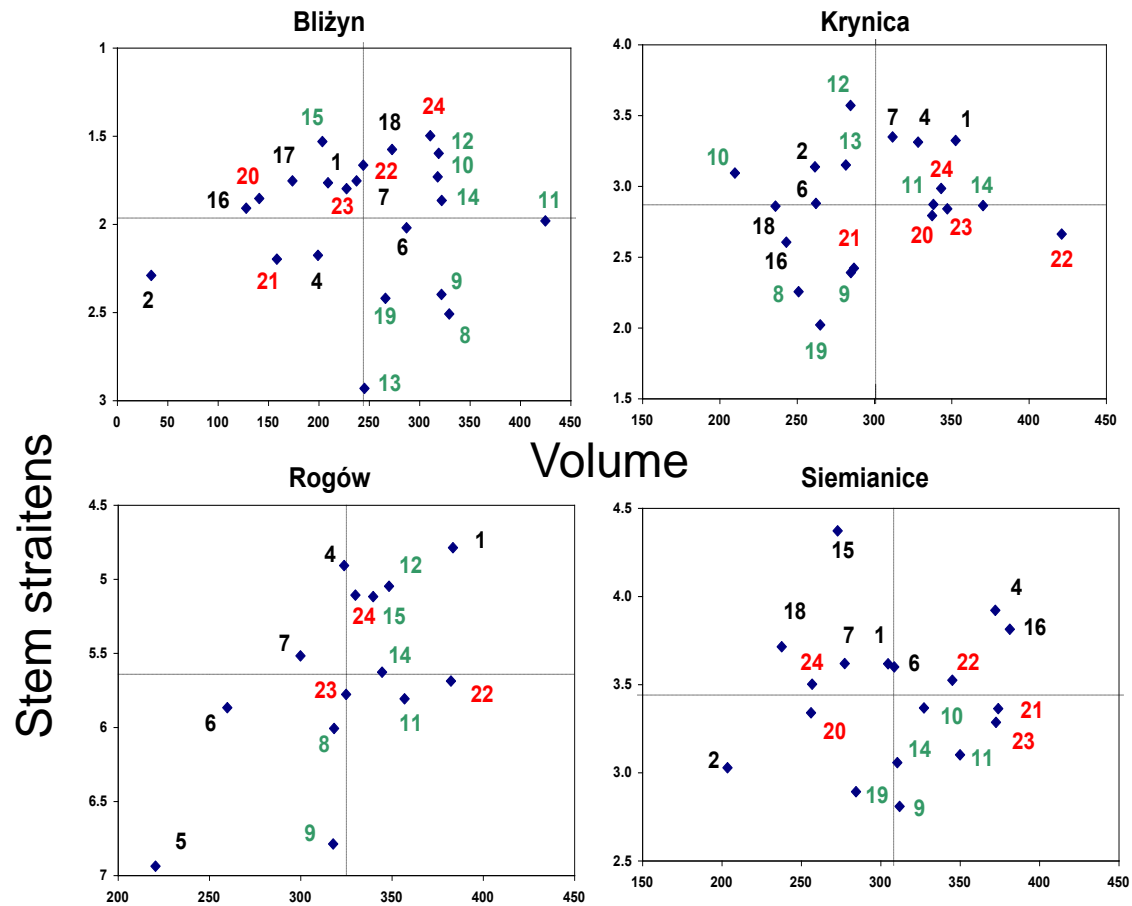
1 – Myślibórz
2 – Pelplin
4 – Konst. Płonne
6 – Konst. Tomkowo
7 – Czerniejewo
8 – Rawa Maz.
9 – Grójec
10 – Marcule

11 – Skarżysko
12 – Bliżyn
13 – Góra Chełmowa
14 – Moskorzew
15 – Dąbrówki
16 – Hołubla
17 - Dukla
18 – Krościenko

19 – Pilica
20 – Prószków
21 – Henryków
22 – Kłodzko
23 – Szczytna Śląska
24 - Kowary

Aims

- The program should cover activities related to the conservation of forest biodiversity, including genetic diversity, as well as breeding of forest trees.

- The program should define the scope of essential and practical activities, as well as additional activities such as:

  - scientific research necessary for the execution of the "Program",

  - establishment of technical infrastructure for the proper execution   of   the "Program".

Aims - targets

1. Improving quality and quantity features of populations (stands) – population selection (stands from "selected" and "tested" categories FBM).

2. Selection the populations and genotypes of high plasticity for the breeding in changing climate condition - population and individual selection.

3. Creation of artificial breeding populations based on seed orchards of a specific (relatively high) genetic diversity

4. Improving the quality features of genotypes – individual selection –genotypes of with specific features - "tested" category FBM.

5. Improving the resistance of genotypes to biotic and abiotic factors – individual selection – genotypes of specific features from the "tested" category FBM.

6. Improving the quantity features of genotypes – production of timber in short rotation cycles – individual selection - selection of genotypes of specific features from the "tested" category, creation of FBM resources to breed clones and mixed clones.

Testing regions / breeding zones

Testing of progeny of forest basic materials will be done grouping FBM in areas named testing regions created on the base of forest administrative division and number of entities selected for testing purposes

Testing Regions

Region I
Region II
Region III

Testing objects

Region	Regional Directorate of State Forest	Seed stands	Plus tree	Seed orchard	Seedling seed orchard
I	Białystok, Gdańsk, Olsztyn, Piła, Poznań, Szczecin, Szczecinek	23	311	18	8
II	Katowice, Wrocław	29	251	8	2
III	Kraków, Krosno, Lublin, Radom	30	454	11	8
Total		**82**	**1016**	**37**	**18**

Problems

- Breeding and silviculture measure should be connected with breeding (no effects , if we do not apply breeding results)
    - larch is disappearing in the forest because it is planted as admixture 10%-20%
    - Natural crosses with Japanese larch (F2, F3)
    - Pure seed crops – problems with fructification

Look into the future

- Fast growing forest tree species
- Using in plantation
- Seeds orchards – more productive
- Better utilisation of the potential for larch growing in Poland

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