CONTRIBUTION TO BREEDING OF HYBRID LARCH

Langner, W. & Schneck, V.: Ein Beitrag zur Züchtung von Hybridlärchen (*Larix* × *eurolepis* Henry). Das Langzeitprogram der Firma von Lochow-Petkus. [Contribution to the breeding of hybrid larch (*Larix* × *eurolepis* Henry). Long-term programme of the von Lochow-Petkus company]. J. D. Sauerländers Verlag, Frankfurt am Main, 1998, 159 pp., ISBN 3–7939–0850– X, price 26 DEM.

Spontaneous hybrids between the European larch (*Larix decidua*) and the Japanese larch (*Larix kaempferi* or *L. leptolepis*) have been known since the end of the 19th century. Since that time numerous controlled hybridizations between these two species have been carried out in many countries, e.g. Germany, Denmark, the Czech Republic, France, mainly due to the promising results of the pioneer experiment carried out in 1935 by W. Langner.

Presented publication gives the results obtained from the large breeding program with hybrid larch started in early sixties in cooperation with the seed and plant breeding company F. von Lochow-Petkus. Crossings were carried out according to a topcross design with clones of *L. decidua* as mother trees pollinated with a mixture of pollen of different clones of *L. kaempferi*. The plus trees of *L. decidua* were mainly selected from indigenous stands in the Alps, but also in older provenance trials and from secondary stands of unknown origin. In the whole, 81 hybrid progenies were produced and planted together with 21 progenies of parent species (*L. decidua* and *L. kaempferi*) as standards. In total 30 field and 1 nursery trials were established on different sites in Germany (27), Austria (2) and France (2).

In general, the hybrid larch (*Larix eurolepis*) is considered as the model species of hybrid origin showing heterosis mainly in vigor and growth character. The annual basal area increment of hybrid progenies was 20–140 % higher than the increment of parent species.

In average, the hybrid progenies survived better than the standard progenies. It was especially visible on drier sites, more suitable for *L. decidua*. The stem form of the hybrid progenies was mostly better than for the standards.

It was reported by several authors that hybrid larch is characterized by higher resistance against to larch cancer in comparison to *L. decidua*. In these experiments the occurrence of the larch cancer has not been observed yet. Whether this situation remains in these hybrid larch plantations also in future, should be observed in subsequent inventories.

From this material one hybrid seed orchard has been established. For these seed orchards the ramets of one clone of *L. decidua* were planted together with many clones of *L. kaempferi*. The seed orchard has been approved as the "tested" reproductive material.

The beginning of this breeding program was at that time when the main attention was paid to maximum yield. In this respect, the hybrid larch even with smaller heterosis effect can be applied for shorter rotation periods. The second aspect of the cultivation of hybrid larch is usually its planting and cultivation outside the ecological requirements of the European larch.

This has been unique breeding program established and financed by a private company in Germany. The second peculiarity of this breeding program was to establish the cost-effective method for the production of hybrid progenies (hybrid seed orchard).

The monograph is recommended for all forest geneticists and breeders and foresters interested in cultivation of larch species as well as for those wishing to formulate long-term breeding programs. It was really a good example of how breeding programs with exotic species can be formulated and brought to life.

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