

MAKING Headway WITH FOREST RESEARCH

COILLTE RESEARCH & DEVELOPMENT

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The advantages of hybrid over European and Japanese larch

The higher price of hybrid larch transplants is more than offset by the increased vigour and quality of the crop produced. Experience to date suggests that Danish sources of hybrid larch seed may be among the best.

Currently larch accounts for between 2 and 4% of Coillte's annual planting programme - mainly Japanese larch. Larch is not only a productive commercial species, but it also provides colour and textural diversity to conifer plantations. Because it is deciduous, it has greater environmental acceptance -it has been called 'an honorary broadleaf'. With three types of larch to choose it is not surprising that there is some confusion about which is the best to plant and why.

This report summaries the results of two research trials comparing hybrid larch with other larches in Ireland. They are:

- Trench 14 which compares hybrid and Japanese larch on cutaway peat.
- J F Kennedy Arboretum, which compares Japanese, European and hybrid larch.

Measurements were made in both these trials in the early spring of 1996. The purpose of this information note is to discuss the options and to demonstrate why hybrid larch provides the best alternative.

Natural distribution and site requirements

European larch

European larch, *Larix decidua* was first introduced to Ireland about 1740. It occurs in the following four separate

populations in Central Europe:

- --the Alps of eastern France, Switzerland, northern Italy and southern Germany;
- the Sudetan Mountains of the Czech Republic; Poland; and
- the Tatra Mountains of Romania.

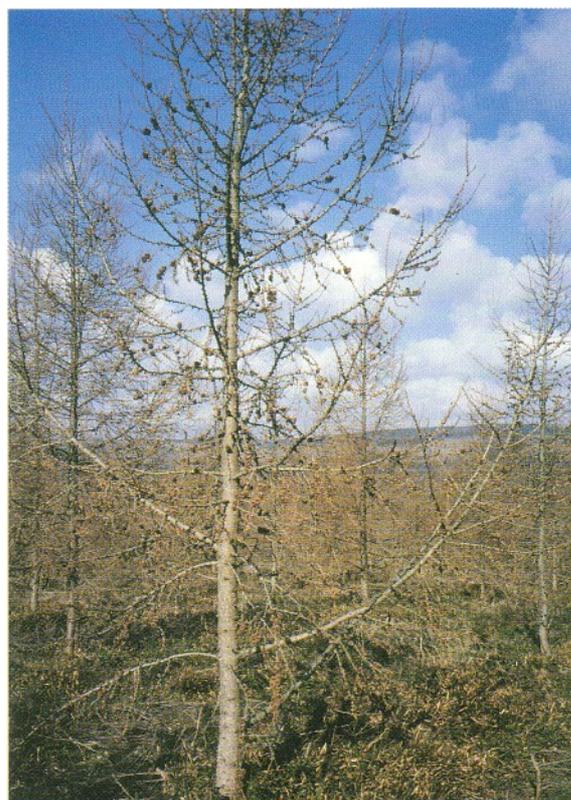
The Czech and Polish seed origins are best for Irish conditions

while seed from the Alps should be avoided. European larch, like all the larches, is a pioneer species and as such is a strong light demander. It does not tolerate exposure very well. It flushes very early in the spring and as a result it is very susceptible to spring frost damage. It tolerates a wide range of soil moistures and textures but it does best on well drained fertile loams. The species has a high transpiration rate, so it requires an adequate supply of soil moisture. Like the other larches it competes well with vegetation and will produce a light shade that permits ground vegetation to develop. It is very good as a nurse species and is windfirm. Sites to avoid are

excessively wet or dry areas, frost hollows, shallow soils over limestone, poor sands, peats or very leached soils. It should not be planted at high elevations, very close to the sea or on heather sites. Yield classes in Ireland average eight. European larch suffers from larch canker as well as a mysterious "dieback" which is not well understood.

Japanese larch

Japanese larch, *Larix kaempferi* (also *L. leptolepis* in older literature) was first introduced to Ireland about 1861. It is native to the island of Honshu in Japan, which is at a latitude similar to Sicily.



Hybrid larch: Ballylusk seed orchard, Co. Wicklow.

Because it grows at elevations between 900 and 2,700 metres it can thrive at more northerly latitudes such as ours. Japanese larch naturally grows in a climate with a hot, wet summer and a cold, dry winter. It has adapted to a high rainfall (1,200 to 3,600 mm) in its native habitat and is therefore very sensitive to dry soils. It grows well in moist, grassy and heath sites. On fertile soils, especially high in nitrogen, poor stem form may result. Japanese larch will tolerate exposure, but the stem form will be adversely affected. It should not be planted on poorly drained, frosty or very exposed sites. It is faster growing than European larch with yield classes in Ireland averaging nine to eleven. Because of this vigour, Japanese larch is not as suitable a nurse species as European larch. Japanese larch is superior to European larch in several aspects including increased resistance to larch canker, the ability to grow on poor sites, later flushing and faster growth.

Hybrid larch

Hybrid larch, *Larix X eurolepis* is a natural hybrid between European and Japanese larch first identified in Scotland in 1905. The hybrid vigour resulting from this cross makes it

hardier, more vigorous, straighter, and more adaptable to poorer and more exposed sites. In addition, it is more disease resistant than either of its parents. It grows well on a variety of sites including heaths and peals, but dry, poorly drained, frosty and very exposed sites should be avoided. On good sites, hybrid larch will grow faster than Japanese larch and will be superior in stem form, vigour, hardiness and resistance to disease. Because of the small amount of hybrid larch planted, there is no Irish yield class information presently available other than the data presented below.

Trial results

It is important to note that stem form and production values of hybrid larch exceed those of both Japanese and European larch (Tables I & 2). In addition, the top height of the hybrid material at the JFK Arboretum, exceeded the European and equalled the Japanese origins **despite being four, years younger.**

Because hybrid larch is the product of a cross between European and Japanese larch the seed must be produced in seed orchards containing clones of matched flowering times of both parent species.

For this reason hybrid larch seed commands a price of about E600 per kilogram compared to f 200 for Japanese larch seed. This higher seed price is reflected in higher prices for hybrid larch plants which may cost E20 per 1,000 more than Japanese larch plants. Nevertheless, this extra cost for hybrid larch is more than offset by the increased growth and stem form of the hybrid.

Timber quality

Larch is considered a hard durable timber and is significantly stronger than other low density softwoods. Timber from this high value species is used for transmission poles and exterior work where a more durable timber is required. Demand for larch fencing material has always been strong with the result that even early thinnings are profitable. Larch timber is resinous and has a tendency to distort when seasoned. Hybrid larch produces timber very similar to that of Japanese larch. It has been suggested that due to their faster growth rate and consequently higher proportion of sapwood, Japanese and hybrid larch may be less durable than European larch.

Recommendations

More larch should be planted because of its wood production, and landscaping attributes. The deciduous nature of larch combined with its nursing capabilities favour its use in mixtures. European larch is recommended in mixtures with broadleaves because of its slower growth rate. In pure plantings, hybrid larch, if available, should be the preferred option with Japanese larch as second choice. Recent results have demonstrated that the source of hybrid larch seed significantly affects the quality of the crop. Experience to date suggests that Danish sources may be among the best. All larch species are classified as diverse conifers and as such receive the appropriate grant aid.

Further information:
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Table 1. Results at JFK Arboretum, New Ross, Co. Wexford

Species	DBH (cm)	Top Ht. (m)	Stem Form (1-4)	Yield Class (ml/ha/yr)	Planting Year
Japanese'	19.86	17.3	2.36	12	1967
Hybrid	19.34	17.3	3.16	14	1971
European	17.29	15.5	2.71	10	1967

Note: Stem form values were 1 - Poor stem form (forking, malformed stem, basal sweep) to 4 - Good stem form (clean, straight, no basal sweep).

Table 2. Results at Trench 14, Clonsast, Co. Kildare

Species	DBH (cm)	Top Ht. (m)	Stem Form (1-4)	Yield Class (ml/ha/yr)	Planting Year
Japanese	19.09	15.6	2.34	12	1971
	19.70	17.25	3.25	14	1

