

SEED ORCHARD

DOUGLAS FIR LA LUZETTE



SPECIES

Pseudotsuga menziesii
(Mirb.) Franco

ORCHARD CODE AND NAME

PME-VG-002 LA LUZETTE-VG

CATEGORY

Tested

BREEDER

INRA (Institut National de
la Recherche Agronomique -
Orléans - France)

CHARACTERISTICS OF THE ORCHARD

- Orchard of clones (cuttings)
- Year of planting : 1980/81
- Place of planting : Sousceyrac (Lot - France)
- Altitude of planting : 700 meters
- Surface area : 34 hectares
- Number of clones : originally, 343 clones; 226, after genetic thinning-out in 2006.
- Origin of clones : USA mainly Washington and East France (detailed list and map attached).
- Number of effective clones * : 214 and 136 after genetic thinning-out
- Number of trees : 5700 and 2837 after genetic thinning-out in 2006.
- Start of production : 1996
- Method of pollination : Free

*This indicator of genetic diversity takes cognizance of the number of representatives of different clones and, where appropriate, between genetically related clones

SUMMARY

La Luzette is the most widely used Douglas seed orchard in France. It combines the best U.S. sources, such as Darrington or Humtulips plantations, with some notable French plantations. It gives a product with good young vigour together with a late bud burst, which protects it from spring frosts. Recent thinning-out has contributed to the improvement of the shape of the trees.



SEED GENERATION

For cultivation in France, La Luzette is recommended for all areas that are appropriate for Douglas fir (mid-mountain, good water supply).

It's also recommended for Bavaria and for Belgium (Walloon region).

CRITERIA AND SELECTION PROCESS

The clones were selected after approximately 10 years, from 10 comparative provenance plantations located in France (Vosges, Haute-Vienne, Meurthe-et-Moselle, Dordogne). The criteria for selection were vigour (height growth after 11 years), lateness of bud burst (to avoid Spring frosts) and quality of branching (slim branches, few in number). The 42 best U.S. provenances and the 20 best French provenances were selected. Cuttings of 343 clones were taken and planted in 1981.

This orchard, therefore, had at the outset a very broad genetic base which enabled genetic thinning, allowing for further improvement of certain criteria. This was carried out in 2006, based upon an analysis of 20 progeny tests. These tests were planted in France between 1992 and 2002 at altitudes ranging from between 420 and 1050 metres. The quality of each clone was judged by the success of its progeny. 45% of the trees and 33% of the clones were thinned out. Improvement has focused in particular on forking and the number of branches, enabling monocyclic growth in individual trees.

After the thinning-out process, the orchard has 83% of U.S. clones, with some plantations such as Darrington (26% orchard trees) or Humtulips (13%) being particularly well represented, the latter being noted for the lateness of its bud burst (for details see Table 1).

EVALUATION

The first significant harvest of seeds took place in 1996. Three homologation tests for the tested category were set up subsequently. They were planted in 1998 in the main Douglas fir plantation areas in France: Montsauche-les-Settons (Morvan), St Sylvester and Peyrat-le-Château (Limousin). Initial results after 6 years showed a gain of 12% in height compared to the Washington control seed area 403, as well as having good shape and later bud burst. More recent results confirm that La Luzette is one of the latest French seed orchards, producing a bud burst four days later than the Washington 403 control seed (3 tests in Haute-Vienne, Lot and Loiret). Based on these results, La Luzette has been placed definitively in the tested category for vigour (growth in height and circumference) and the lateness of bud burst.

Similarly, within the framework of a European project, 9 additional tests will facilitate the evaluation of La Luzette orchard for wider use. These tests were planted between 1998 and 2000 in Spain (Galicia and the Basque Country), Germany (Lower Saxony), Belgium (Wallonia), the United Kingdom (South Wales and West Central England) and France (Morvan and Limousin). They compare German, Belgian, French and Dutch seed orchards with plantations from Europe or from the natural growing area.

Finally, taking into consideration the prospect of climate change, La Luzette is in the process of being evaluated in numerous parts of France, in different climatic conditions and at altitudes ranging from between 100 to 1300 metres.



ORIGIN OF LA LUZETTE ORCHARD CLONES (AFTER GENETIC THINNING-OUT IN 2006)

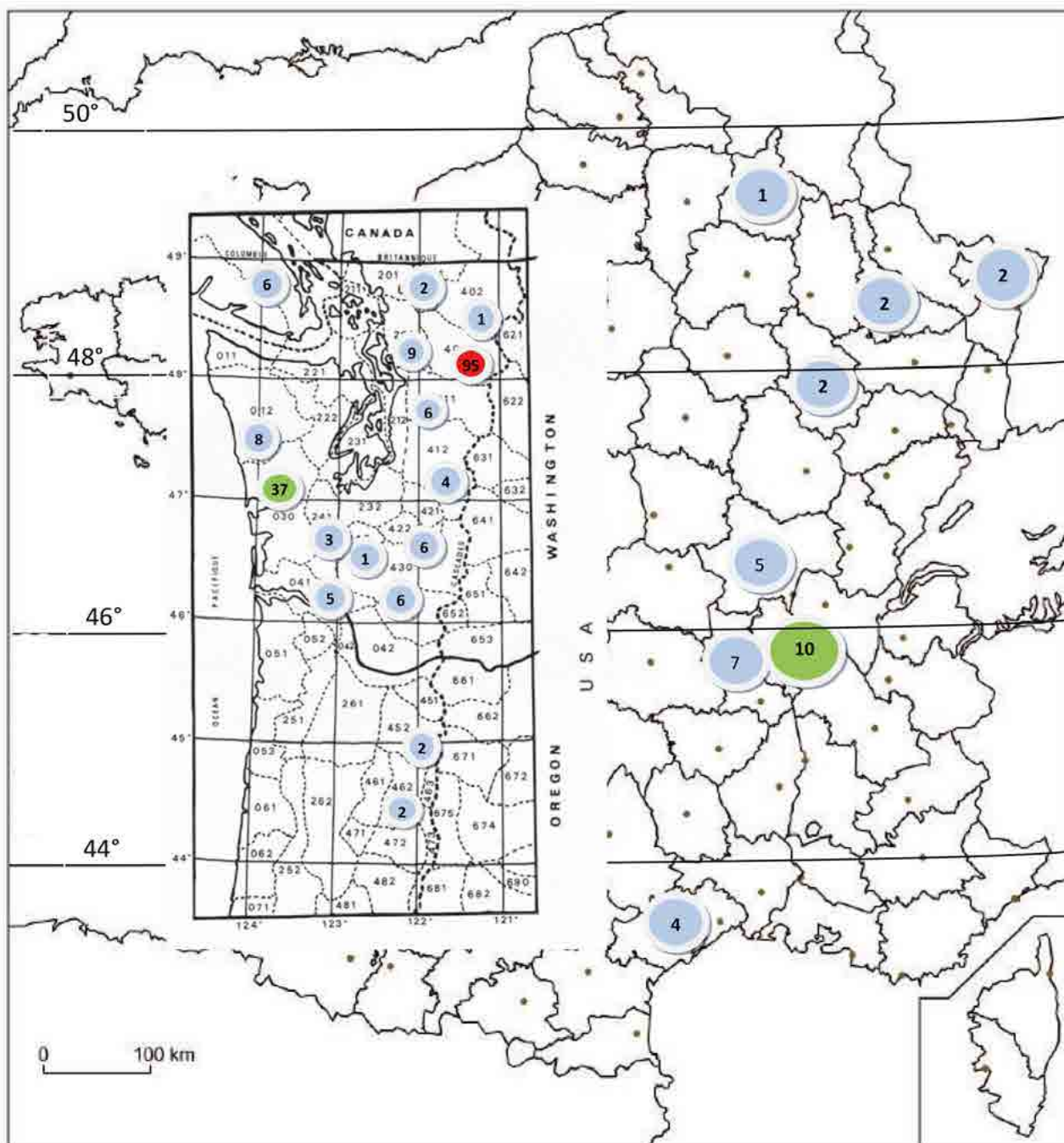
COUNTRY / STATE	SEED ZONE OR DEPARTMENT	PLANTATION	NUMBER OF CLONES	NUMBER OF TREES	% IN NUMBER OF TREES
USA - Washington	012	Forks, Hoh-River, Lake-Crescent	8	189	78 %
USA - Washington	030	Humtulpils, Matlock	37	488	
USA - Washington	041	Naselle, Skamokava	5	94	
USA - Washington	202	Arlington, Granite-Falls, Camano	9	106	
USA - Washington	241	Shelton	3	54	
USA - Washington	242	Tenino	1	1	
USA - Washington	401	Glacier	2	9	
USA - Washington	402	Bacon-Point	1	17	
USA - Washington	403	Darrington, Perry-Creek, Tenas-Creek	95	847	
USA - Washington	411	Gold-bar, Skykomish	6	113	
USA - Washington	412	Enumclaw, Chester-Morse-Lake	4	48	
USA - Washington	422	Ashford	6	125	
USA - Washington	430	Seaquest, Silver-Lake	6	119	
USA - Oregon	452	Molalla	2	30	
USA - Oregon	462	Detroit	2	34	
Canada British Columbia	1020	Courtenay, Gold.River, Sooke, Cameron-lake	6	71	3 %
France	08 Ardennes	Vendresse	1	11	17 %
France	34 Hérault	Moussans	4	115	
France	42 Loire	Arcon, Bois-Pagnon, Renaison	7	57	
France	52 Haute-Marne	Chaumont	2	4	
France	54 Meurthe et Moselle	La Sivrite	2	37	
France	67 Bas-Rhin	Hohwald	2	32	
France	69 Rhône	Chevenatte, Claveisolles, Grandris, Matour-Giraud, Ronno, Saint-Just-d'Avray	10	161	
France	71 Saône et Loire	Croux, Saint-Bonnet-de-Joux, Souvigne	5	75	
TOTAL			226	2837	100 %



SEED ORCHARD DOUGLAS FIR LA LUZETTE

MAP OF ORIGIN OF LA LUZETTE SEED ORCHARD CLONES

Number of clones per Seed ZAone of origin (French Department)



N.B.: the two maps are shown on the same scale



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