

SEED ORCHARD

DOUGLAS FIR CALIFORNIA



SPECIES

Pseudotsuga menziesii
(Mirb.) Franco

ORCHARD CODE AND NAME

PME-VG-006, CALIFORNIA-VG

CATEGORY

Qualified

BREEDER

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

CHARACTERISTICS OF THE ORCHARD

- Orchard of clones (cuttings)
- Year of planting : 1985/86
- Place of planting : St Denis-Catus (Lot - France)
- Altitude of planting : 300 meters
- Surface area : 5,5 hectares
- Number of clones : 116
- Origin of clones : California USA (detailed list at end of page)
- Number of effective clones * : 86
- Number of trees : 450
- Start of production : 2008
- 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

CRITERIA AND SELECTION PROCESS

The natural terrain of the Douglas fir covers a large area from British Columbia to Mexico. Trees of the southern area have developed an adaptation to summer drought, which could be advantageous in marginal conditions of cultivation and with the prospect of the consequences of global warming.

SUMMARY

The main advantage of this new seed orchard is its resistance to summer drought. The basic material comes, for the most part, from northern California, an area subject to dry summers. Clones were subsequently selected in the south of France, an area also subject to conditions of prolonged summer drought. The result of this adjustment is an earlier bud burst, which enables growth to start in the trees before the onset of drought. The selection, also impacts obviously on vigour and shape.



SEED GENERATION

CRITERIA AND SELECTION PROCESS

INRA collected this type of material and beginning in 1968, planted up four provenance tests, at altitudes ranging from between 540 and 1200 metres, in the south of France, which has a Mediterranean climate with a pronounced summer drought, (Collobrière and Lambert, in the Var, and Saint-Andre-des-Alpes, in the Hautes-Alpes).

Selection was made after 8 and 16 years of planting. It focused on vigour and shape (straightness of the trunk, no forking, open angle of insertion of the branches), lateness of bud burst and resulted in the retaining of 116 trees corresponding to 18 areas of origin, mostly Californian, to which were added one from New Mexico and another from the inner area of Washington.

Cuttings were taken from the 116 selected trees and planted in the Lot region of France.

ADVICE FOR CULTIVATION

For cultivation of Douglas fir in France, California-VG is recommended for marginal areas, where the effects of summer drought are to be anticipated (Mediterranean region and the southern Massif Central).

EVALUATION

The first significant harvest of seeds took place in 2008. This facilitated the setting up of numerous evaluation tests in 2009 and 2010, at different altitudes and under various climatic conditions; in marginal conditions but also in optimal conditions (Aude, Lot, Hérault, Loiret, Cantal, Haute-Vienne, Creuse Puy de Dome ...). The first results (spring 2010) demonstrate that the California orchard is the earliest of the French seed orchards, bud bursting occurring approximately 8 days before the Washington 403 provenance (3 tests in Haute-Vienne, Lot and Loiret).

ORIGIN OF CALIFORNIA ORCHARD CLONES

STATE OF ORIGIN	SEED ZONE	PLANTATION	IUFRO CODE	NUMBER OF CLONES	NUMBER OF TREES
USA California	93	Matols Rivers		21	71
USA California	93	Mattola		7	25
USA California	94	Fort Bragg	1 147	4	19
USA California	161	Mount Diablo		6	24
USA California	340	Covelo 1	1 144	4	20
USA California	340	Covelo 2	1 145	5	30
USA California	(340)	Angle Creek		7	37
USA California	351	Willits	1 148	4	12
USA California	371	Alder Springs	1 146	3	16
USA California	380	Lower Lake	1 149	4	24
USA California	380	St Helena Mountain	1 150	4	12
USA California	521	Burney	1 137	21	82
USA California	521	Dunsmuir	1 136	3	14
USA California	526	Cable Road		6	12
USA California	526	Pilot Creek		10	30
USA California	532	Lake Edson		5	18
USA Washington	830	Spokane	1 065	1	3
USA New Mexico		Mongollon Road	297 - 298	1	1
TOTAL				116	450



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