

# SEED ORCHARD

## DOUGLAS FIR WASHINGTON 2



### SPECIES

*Pseudotsuga menziesii*  
(Mirb.) Franco

### ORCHARD CODE AND NAME

PME-VG-005 WASHINGTON 2-VG

### CATEGORY

Qualified

### BREEDER

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

## CHARACTERISTICS OF THE ORCHARD

- Orchard of clones (cuttings)
- Year of planting : 1983/84
- Place of planting : Lisle-sur-Tarn (Lot - France)
- Altitude of planting : 250 meters
- Surface area : 8,47 hectares
- Number of clones : 135
- Origin of clones : Washington USA
- Number of effective clones \* : 66
- Number of trees : 632
- Start of production : 2007
- 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

This seed orchard is composed exclusively of provenances from Washington and more precisely from the western slopes of the Washington Cascade Mountain Range. The first evaluations already place it as the latest of the French orchards. The other characteristics that have been improved by selection are growth, density of wood and shape.



SEED GENERATION

### CRITERIA AND SELECTION PROCESS

The material was selected by INRA in a provenance/progeny test located in Cendrieux in the Dordogne (24). This test compared 26 IUFRO provenances that were themselves composed of 370 maternal progenies originating from the western slopes of the Cascade Mountain Range (Washington State, USA). The combined selection focused as much on the individual as on the familial quality, for the following criteria: vigour, (height at 12 years and circumference at 16 years), lateness of bud break (to avoid spring frosts), density of wood (measured by pycnolite) and shape (open angle of branch, no forking, straightness of trunk).

135 trees, were selected, corresponding to 17 provenances (from the 26 of the Cendrieux test) and 73 progenies (see details of the composition in the table). Cuttings were taken from the 135 selected trees, then planted in France in the Sivals (Tarn) orchards.



### ADVICE FOR CULTIVATION

For cultivation in France, Washington 2 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).

### EVALUATION

Compared to the original Cendrieux population test, the genetic gain is estimated at +12% for the total height, +19% for the circumference, with a bud burst of approximately 6 days later than the average plantation.

Three partial progeny tests were planted in 1998 in the Ardennes, the Creuse and the Tarn. Measurements taken after 5 years in the Ardennes and in the Tarn show good lateness, even better than that found in the orchards of La Luzette and Darrington. After 8 and 10 years, growth in terms of height is at least as good as from these same orchards.

The first significant harvest of seeds took place in 2007. It facilitated the setting up of a number of assessment tests in 2009 and 2010 at various altitudes and under various climatic conditions (Haute-Vienne, Creuse, Loiret, Puy de Dome, Aude, Lot, Cantal ...). The first results (Spring 2010) confirm the lateness of bud burst, being 7-9 days later than the control seed zone 403, which makes Washington orchard 2, the latest of the French orchards.

# SEED ORCHARD

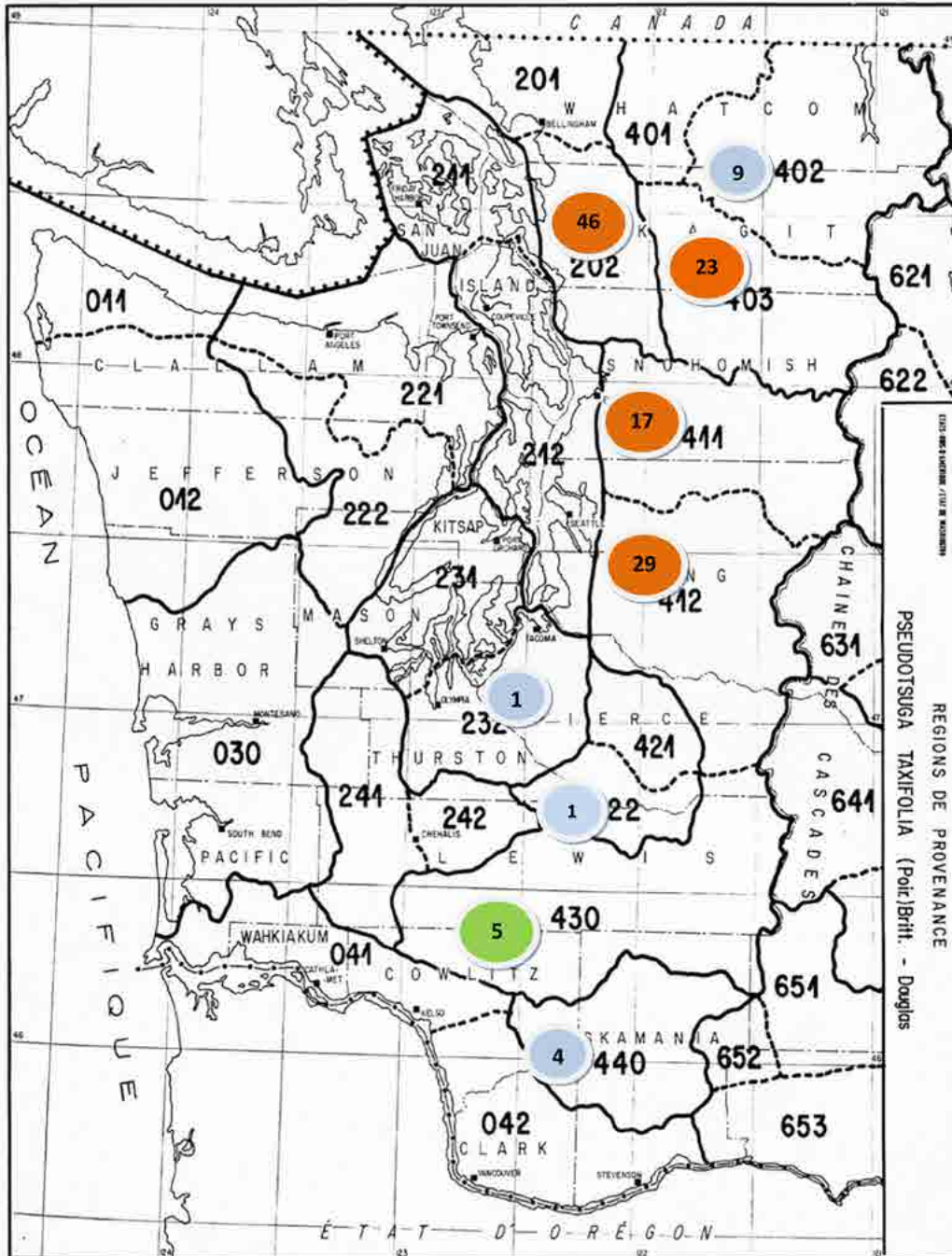
## DOUGLAS FIR WASHINGTON 2

### ORIGIN OF WASHINGTON 2 ORCHARD CLONES

SEED ZONE	PLANTATION	IUFRO CODE	LATITUDE N	LONGITUDE W	ALTITUDE	NUMBER OF PROGENIES	NUMBER OF CLONES	NUMBER OF TREES	% IN NUMBER OF TREES
202	Segro Wooley	1051	48° 32'	122° 19'	60 m	3	4	16	3 %
202	Arlington	1054	48° 13'	122° 04'	90 m	9	22	98	16 %
202	Granite Falls	1057	48° 05'	122° 02'	90 m	10	20	72	11 %
232	Yelm	1080	47° 01'	122° 44'	60 m	1	1	4	1 %
402	Concrete	1047	48° 39'	121° 43'	470 m	5	6	45	7 %
402	Bacon Point	1049	48° 36'	121° 23'	500 m	2	2	9	1 %
402	Marble Mount	1050	48° 35'	121° 24'	120 m	1	1	2	0,3 %
403	Darrington	1053	48° 16'	121° 38'	150 m	12	23	112	18 %
411	Gold Bar	1063	47° 51'	121° 39'	120 m	2	4	20	3 %
411	Skykomish	1067	47° 42'	121° 20'	300 m	6	13	57	9 %
412	Denny Creek	1070	47° 24'	121° 32'	550 m	3	6	20	3 %
412	Enumclaw	1075	47° 16'	121° 56'	240 m	10	23	122	19 %
422	Alder Lake	1081	46° 48'	122° 17'	420 m	1	1	1	0,2 %
430	Castle Rock	1088	46° 19'	122° 52'	150 m	3	4	26	4 %
430	Randle	1085	46° 33'	122° 03'	330 m	1	1	2	0,3 %
440	Cougar	1090	46° 05'	122° 18'	500 m	1	1	9	1 %
440	Yale	1091	46° 00'	122° 22'	120 m	3	3	17	3 %
TOTAL						73	135	632	100 %

MAP OF ORIGIN OF WASHINGTON 2 SEE D ORCHARD CLONES

Number of clones per US Seed Zone of origin



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