

Poplar Cultivar 'DENDER'

Passport

Interspecific hybrid	<i>Populus.deltoides</i> x (<i>Populus trichocarpa</i> x <i>Populus maximowiczii</i>)		
Parents	Mother	<i>P.deltoides</i> 'S.333-44' (Michigan)	
	Father	'S.725-37' = <i>P.trichocarpa</i> 'S.3-5'* x <i>P.maximowiczii</i> (Japan)	
		<i>P.trichocarpa</i> 'S.3-5' * = <i>P.trichocarpa</i> 'V.26' (Washington) x <i>P.trichocarpa</i> 'V.23' (Idaho)	
Creation	1970, by controlled crossing at INBO, Geraardsbergen, Belgium		
Plant Variety Protection Certificate	EU 44784 from 17/10/2016		
Gender	male		
INBO Breeding nb	70.078/2		

Phenotype

Stem form	straight
Forking	rarely
Branch thickness	forming of a few thick branches at a height of 6m or more
➤ sidewalk clearance starts at the tree age of 4-5 years	



Phenology

At the INBO nursery in Geraardsbergen (50° 48' N, 3° 57' E) , the cultivar 'Dender' reaches bud burst in the first week of April and the timing of bud set in autumn is mid September. (Fig. 1).

Fig 1. Phenology of the cultivar Dender in comparison to the INBO cultivars Marke, Bakan, Skado and Vesten and observed in the INBO nursery at Geraardsbergen (2015)

	Bud burst										Bud set							
	17-march	24-march	31-march	7-april	14-april	21-april	28-april	5-may	11-may	18-may	juin	july	august	7-sep.	14-sep.	21-sep.	28-sep.	5-oct
Dender				■	■	■	■	■	■	■	■	■	■	■	■			
Marke				■	■	■	■	■	■	■	■	■	■	■	■			
Bakan			■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Skado			■	■	■	■	■	■	■	■	■	■	■	■	■	■		
Vesten						■	■	■	■	■	■	■	■	■	■			

Growth characteristics

Fig 2. Height and diameter of two-year-old trees of the cultivar Dender in the INBO nursery at Geraardsbergen, compared to the INBO cultivars Marke, Bakan and Skado

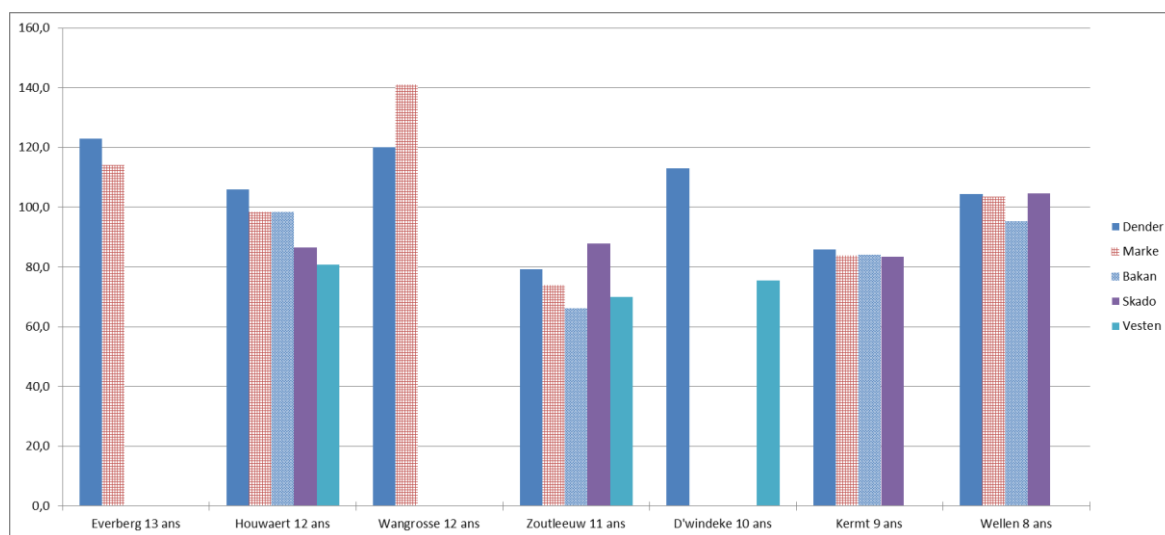
Cultivar	# trees	Height(cm)	Category 1 (D25-30mm) (%)	Category 2 (D30-40mm) (%)	Category 3 (D40-50mm) (%)
Dender	27	424	0	37	63
Marke	21	406	0	29	71
Bakan	32	523	16	72	13
Skado	37	556	40	57	3

The *Mean Annual Increment* (MAI) – circumference- has been measured in 7 field trials installed in the north of Belgium on different soil types (Fig.3) and ranges between 8 cm and 12,2 cm.

Fig 3. Soil properties of the 7 field sites mentioned below

Fieltrial name	Everberg	Houwaert	Wangrosse	Zoutleeuw	Denderwindeke	Kermt	Wellen
Soil texture	No profile	B-horizont	No profile	B-horizont/ No profile	No profile	No profile	
Soil profile	very strong gleying clay soil	moderate gleying sandy loam soil	strong gleying loam soil	Weak/modera te gleying loam soil	strong gleying loam soil	strong gleying loam soil	peat

Fig 4. Mean annual increment (circumference in cm) of the cultivar Dender in seven field trials aging from 8 to 13 years compared the INBO cultivars Marke, Bakan, Skado and Vesten (planting distance - 8m x 8m)



Marke = *P.deltoides* x *P.trichocarpa* x *P.maximowiczii*

Bakan = *P.trichocarpa* x *P.maximowiczii*

Skado = *P.trichocarpa* x *P. maximowiczii*

Vesten = *P.deltoides* x *P.nigra*

Wood technology

Wood properties were obtained from the Laboratory for wood technology, University of Ghent, Belgium.

Physical properties	
Wood density (60%RV)	405 ± 41 kg/m ³
Heartwood proportion (%)	20-40
Tension wood proportion (%)	20-36
Mechanical properties	
Modulus of elasticity (N/mm ²)	5200-8200
Modulus of rupture (N/mm ²)	40-45
Industrial processes	
veneer A/B-grade (%)	35-40
C1-grade (%)	60-65
The wood is suitable for	
Veneer **	Good / very good (even for CE multiplex)
Saw wood	Good/very good

Disease resistance

The cultivar 'Dender' has been tested and selected for its good resistance/tolerance to the leaf rust *Melampsora larici-populina*, leaf spot disease caused by *Marssonina brunnea*, bacterial canker caused by *Xanthomonas populi* and woolly aphid, caused by *Phloemyzus passerinii*.

- Resistance to *Melampsora larici-populina* and *Marssonina brunnea* has been observed during several consecutive years at the INBO nursery in Geraardsbergen.
- Resistance to *Xanthomonas populi* has been tested by artificial infection on five 2-year-old trees
- Resistance to *Phloemyzus passerinii* has been tested by artificial infection at the CREA Centro di ricerca Foreste e Legno, Casale Monferrato, Italy

Fig 5. Resistance of the cultivar Dender to the most important poplar diseases in Europe

Cultivar	Leaf rust (<i>Melampsora larici-populina</i>)	Leaf spot disease (<i>Marssonina brunnea</i>)	Bacterial canker (<i>Xanthomonas populi</i>)	Woolly aphid (<i>Phloomyzus passerinii</i> (Sign.))
Vesten	tolerant	tolerant	tolerant	Field tolerant
Bakan	tolerant	tolerant	tolerant	tolerant
Skado	tolerant	tolerant	tolerant	tolerant
Dender	Very tolerant	tolerant	tolerant	tolerant
Marke	Very tolerant	tolerant	tolerant	tolerant

Biomass production under short rotation coppice

Realized dry weight (ton/ ha/ y) for the cultivar Dender under short rotation coppice has been measured in an experimental site located in Grimminge (Belgium) and planting density of 10.000 cuttings/Ha.

The plantation has been harvest after 2, 4 and 6 years. Fig 6. shows realized dry weight after the last harvest. Dender is producing 24,5 ton / ha/ y after the third harvest.

Fig 6. Biomass production (dry weight) after three 2-year coppice rotations

CULTIVAR	Realized dry weight ton/jr.ha	Mean height/shoot (cm)	mean diameter/shoot (cm)	# shoots/stool
Dender	24,5	435	2,8	4,2
Marke	19,9	396	2,4	5,1
Bakan	17,4	397	2,4	3,4
Skado	18,4	360	2,0	5,0

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