

Poplar Cultivar 'BAKAN'

Passport

Interspecific hybrid	<i>Populus trichocarpa x Populus maximowiczii</i>		
Parents	Mother	P.trichocarpa 'S.724-116'	
	Father	P. maximowiczii 'S.122-3' (Japan)	
		S.724 = V.235 (Fritzi Pauley) x V.24 (Columbia River) S.122 = P. maximowiczii, Hokkaido, Japan	
Creation	1970, by controlled crossing at INBO, Geraardsbergen, Belgium		
Plant Variety Protection Certificate	EU 44786 from 17/10/2016		
Gender	Male		
INBO Breeding N°	75.023/18		

Phenotype

CULTIVAR	TRUNK FORM & COLOR	FORM OF TREE CROWN	BRANCHINESS
Bakan	Light flexible trunk smooth, pale bark	<i>elongated, egg-shaped crown (wider than Dender & Marke)</i>	<i>fairly thin branches</i>
Skado	Light flexible trunk smooth, pale bark	<i>elongated, egg-shaped crown (wider than Dender & Marke)</i>	<i>fairly thin branches</i>
Dender	Straight to light flexible trunk smooth, pale bark	<i>elongated, egg-shaped crown</i>	<i>Fairly thin branches heavy branch at a height of 6 to 8 m</i>
Marke	Straight to light flexible trunk smooth, pale bark	<i>elongated, egg-shaped crown</i>	<i>Fairly thin branches heavy branch at a height of 6 to 8 m</i>

Important: Requires early monitoring and shape correction



Bakan – tree form and branchiness



Bakan – trunk form and color

Phenology

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

Bud burst is one week earlier than Dender and Marke and bud set is one week later.

Fig 1. Phenology of the cultivar Bakan compared to the INBO cultivars Dender, Marke, 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 Bakan in the INBO nursery at Geraardsbergen, compared to the INBO cultivars Dender, Marke 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 trees of Bakan are longer but on average less thick than those of the cultivars Dender and Marke.

Mean Annual Increment (MAI) - circonference

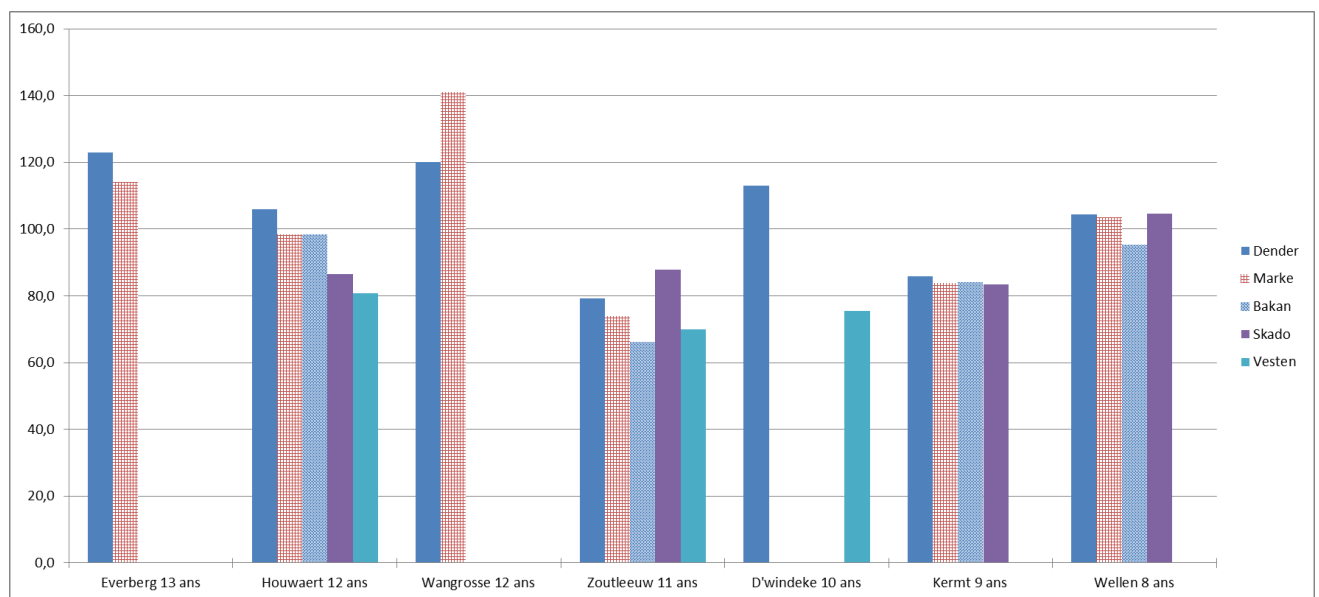
MAI has been measured in 7 field trials aging from 8 to 13 years and installed in the north of Belgium on different soil types – planting distance 8m x 8m



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

Fieltrial name	Everberg	Houwaert	Wangrosse	Zoutleeuw	Denderwindeke	Kermt	Wellen
Soil profile	No profile	B-horizont	No profile	B-horizont/ No profile	No profile	No profile	
Soil texture	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)



Wood technology

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

Physical properties	
Wood density (60%RV)	420
Heartwood proportion (%)	24
Tension wood proportion (%)	20
Mechanical properties	
Modulus of elasticity (N/mm ²)	10200
Modulus of rupture (N/mm ²)	70
Industrial processes	
veneer A/B-grade (%)	25
C1-grade (%)	75
The wood is suitable for	
Veneer **	Due to the low share of heartwood and tensionwood, this clone is very suitable for the production of veneer. Where also comes the high degree of whiteness, also with the C1 veneer. The larger proportion of C1 veneer is due to the presence of many small brushes that can easily be avoided by good pruning.
Saw wood	This clone has a very favorable strength-density ratio, which also makes it possible to produce quality saw wood.

Disease resistance

The cultivar 'Bakan' 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 Bakan 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>Phloemyzus passerinii</i> (Sign.))
Vesten	tolerant	tolerant	tolerant	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 Bakan under short rotation coppice in two experimental sites

Experimental site 1

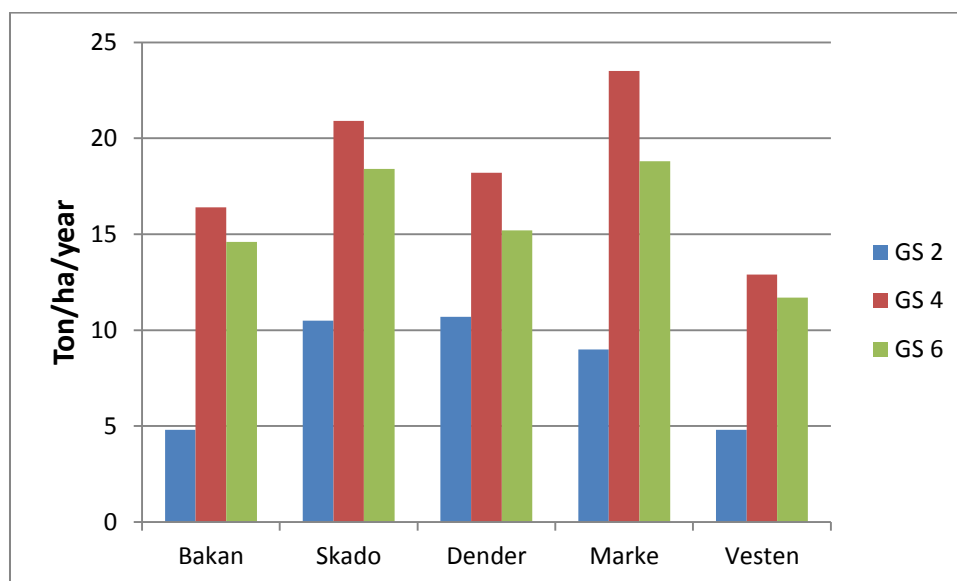
Location: Grimminge (Belgium, Lat. 50.7878759; Long. 3.938241)

Planting density: 10.000 cuttings/Ha.

Soil texture : *moderate gleying loam soil*; Soil profile: *B-horizont*

The plantation has been harvest after 2, 4 and 6 years.

Fig.6 Realized dry weight after 2, 4 and 6 years. Bakan is producing 16.4 ton/ha/y after the second harvest and 14.6 ton / ha/ y after the third harvest.



Ir. Linda Meiresonne, 2018 (INBO)

Experimental site 2

Location: Lochristi, Flanders (Belgium, Lat. 51.11194444; Long. 3.85055556)

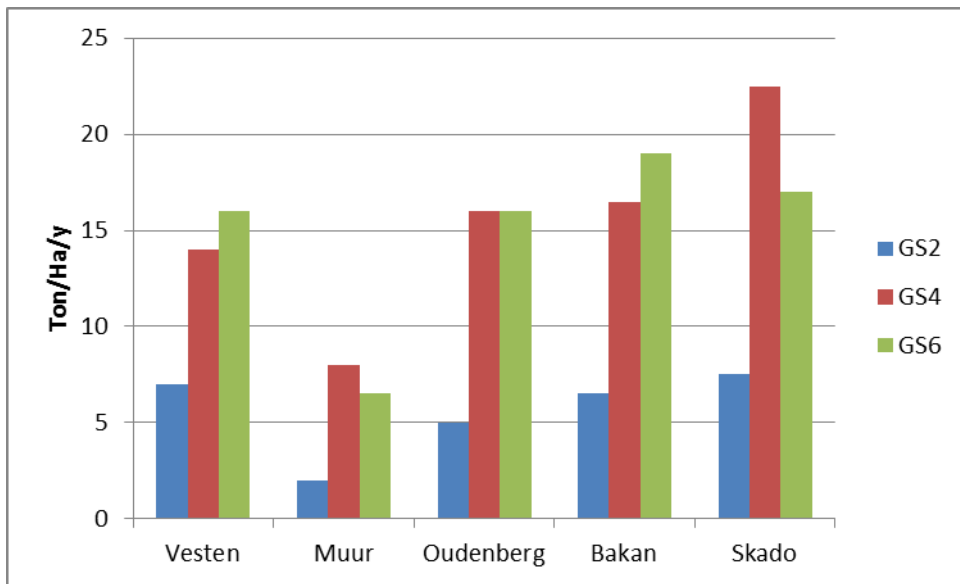
Soil texture: loamy sand (clay content of 11% between 30–60 cm depth) with deeper clay-enriched sand layers (~75 cm),

Planting density : 8.000 cuttings/Ha.

Planting design: double rows with alternating distances of 0.75 and 1.50 m between the rows and 1.1 m within the row.

The plantation has been harvest after 2, 4 and 7 years.

Fig 6. Realized dry weight for each second growing season (GS2, GS4 and GS7) of each 2-year-rotation. Bakan is producing 18,5 Ton /ha /y after the third harvest.



Bakan, 15 years, Zoutleeuw (Belgium)