



# POPLAR CLONES

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# 'Geyles'

*Populus maximowiczii × P. nigra*

NZ 5034

Bred in New Zealand in 1993, 'Geyles' was released in 2011. It is a male clone.

## Identification

'Geyles' leaves are rounded, dark green on the upper surface and greyish green below. The leaf edge is wavy and finely toothed. Leaf stalks are reddish. 'Geyles' comes into leaf early in spring and leaves are retained well into autumn.

'Geyles' has a narrow crown, excellent apical dominance, and generally light branching. 'Geyles' has a wood density of 336 kg/m<sup>3</sup>. Bark roughens later than *P. x euramericana* clones. Trunk becomes scalloped in older trees.



## Typical uses, site requirements, pest and disease resistance

'Geyles' is wind and frost tolerant, and performs well in most environments except for coastal sites. It is rust resistant. Growth rates are high. Height and DBH at age 7 (age 12) in a sheltered site was 13.4 (26.8) m and 18.3 (33.2) cm and in a windy site was 10.7 (18.7) m and 15.6 (26.5) cm. Suitable for soil conservation.





# 'Hororata'

*Populus maximowiczii × P. nigra NZ 5033*

'Hororata' was bred in New Zealand in 1993 and released for commercial use in 2011. It is female.

## Identification

'Hororata' leaves are more rounded, dark green on the upper surface and greyish green below. The leaf edge is wavy and slightly toothed.

'Hororata' has a narrow crown, apical dominance, and light branching. Angle of lower branches is greater than other maxi-nigra clones. Wood density is low at 287 kg/m<sup>3</sup>.

Bark roughens up early. 'Hororata' may produce double leaders

## Typical uses, site requirements, pest and disease resistance

'Hororata' is very hardy, and performs well in moist environments except for coastal sites. It is rust resistant.

Height and DBH at age 7 (age 12) in a sheltered site was 9.4 (17.4) m and 12.5 (17.4) cm and in a windy site was 6.5 (10.2) m and 10.8 (14.2) cm. Suitable for soil conservation. Ideal in sheltered sites where a slow growing tree is required.



# 'Mapiu'

*Populus maximowiczii* × *P. nigra* NZ 5035

'Mapiu' was bred in New Zealand in 1993 and released for commercial use in 2011. 'Mapiu' is female.

## Identification

'Mapiu' leaves are rounded, dark green on the upper surface and greyish green below. The leaf edge is wavy and sharp toothed. 'Mapiu' comes into leaf early in spring and leaves are retained the longest of the maxi-nigra clones.

'Mapiu' has a narrow crown, excellent apical dominance, and generally light branching. 'Mapiu' has a wood density of 313 kg/m<sup>3</sup>. Bark roughens later than *P. x euramericana* clones

## Typical uses, site requirements, pest and disease resistance

'Mapiu' is wind and frost tolerant, and performs well in moist environments except for coastal sites. It is rust resistant. 'Mapiu' is less vigorous than 'Geyles'. Height and DBH at age 7 (age 12) in a sheltered site was 11.8 (22.9) m and 18.0 (32.6) cm and in a windy site was 9.3 (14.5) m and 13.2 (20.4) cm. Suitable for soil conservation and timber.

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# 'Pecam'

*Populus maximowiczii* × *P. nigra* NZ 5036

'Pecam' was bred in New Zealand in 1993 and released for commercial use in 2011. 'Pecam' is male.

## Identification

'Pecam' leaves are ovoid, dark green on the upper surface and greyish green below. The leaf edge is slightly toothed. Leaf stalks pinkish.

'Pecam' has a narrow crown, apical dominance, and very light branching. Wood density is 360 kg/m<sup>3</sup>. Bark is smooth.

## Typical uses, site requirements, pest and disease resistance

'Pecam' is very hardy, and performs well in most environments except for coastal sites. It is rust resistant. 'Pecam' is the least vigorous of the maxi-nigra clones. Survival rate was highest of all the maxi-nigra clones in field trials. Height and DBH at age 7 (age 12) in a sheltered site was 9.4 (17.4) m and 12.5 (17.4) cm and in a windy site was 6.5 (10.2) m and 10.8 (14.2) cm. Suitable for soil conservation. This clone is ideal where a healthy, slow growing tree is required. Could be prone to cattle damage

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# 'Shinsei'

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*Populus nigra 'LP 1' x P. maximowiczii*

NZ 85-069-002

'Shinsei' is a NZ-bred PVR-licensed tree that was first released commercially in 2000. It originates from a 1985 cross between the Italian *P. nigra 'LP 1'* and a *P. maximowiczii* male clone from Hokkaido, Japan.

## Identification

'Shinsei' leaves are small and round, with a crinkled, undulating leaf appearance. The leaves are dark green on the upper surface and whitish-green below. 'Shinsei' leafs up earlier in spring than most other poplars, due to the *P. maximowiczii* parentage. The stem colour is grey-green, and the branch and trunk surfaces are smooth in texture.

'Shinsei' has good apical dominance and a steep branch angle, resulting in a narrow crown with no heavy limbs. 'Shinsei' is male.

## Typical uses, site requirements, pest and disease resistance

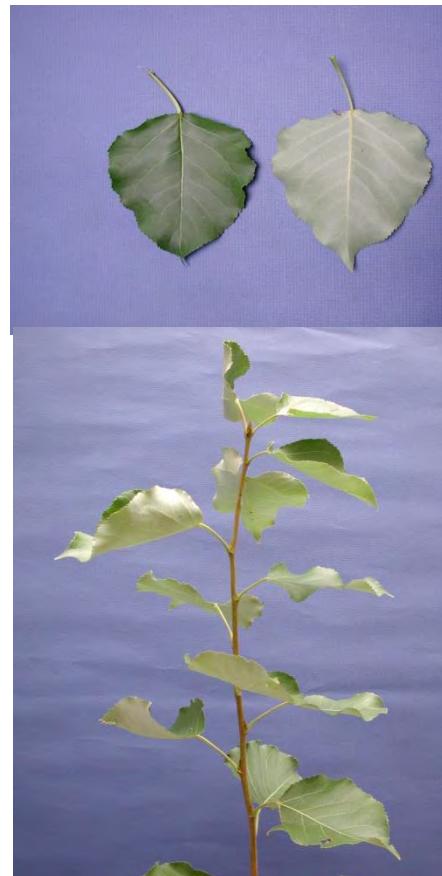
'Shinsei' is recommended for general soil conservation purposes, particularly on moist inland sites, and is reasonably wind tolerant.

'Shinsei' is resistant to leaf rusts, leaf anthracnose, and also has low possum palatability.

## Performance in trials

The first nationwide trials of 'Shinsei' were established in 1999. At age 4, average heights of 'Shinsei' established as 3 m poles were 5.7 m (Canterbury), 5.2 m (Hawkes Bay) and 6.4 m (Te Kuiti). At Te Kuiti (ann. rainfall 1500 mm), average 'Shinsei' height was over 1 m taller than each of the *P. x euramericana* hybrids.

'Shinsei' height in a Manawatu gene pool collection was 16 m at age 10. The tree shown below (centre) is aged 3, in hill country near Palmerston North (ann. rainfall 1100 mm).



# 'Argyle'

*Populus deltoides* x *P. nigra*  
NZ 5015

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'Argyle' is a PVR-licensed variety resulting from the 1980 *P. x euramericana* crosses.

## Identification

'Argyle' leaves are heart-shaped with an undulating leaf margin. The leaves flush bronze in late September, maturing to dark green above and light green below. 'Argyle' is easily recognised by its rough furrowed bark that develops while the tree is very young, typically in the second or third growing season.

The crown of 'Argyle' spreads broadly in fertile pastoral situations, and unruly heavy limbs are common. 'Argyle' is female.

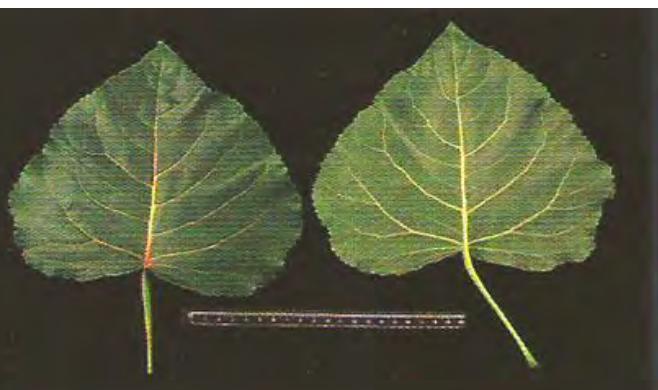
## Typical uses, site requirements, pest and disease resistance

'Argyle' is suitable for soil conservation and stock shelter. 'Argyle' will develop a narrower crown form if used on hard, low fertility sites. Being very vigorous, 'Argyle' is commonly used as a fodder tree, and the early rough bark development makes it useful on cattle farms. Like 'Veronese', it tolerates relatively dry and windy sites, and is often used in east coast regions.

'Argyle' is palatable to possums, but has moderate resistance to poplar leaf rusts and leaf anthracnose.

## Performance in trials

'Argyle' is one of the fastest growing 1980 *P. x euramericana* hybrids. In most trials 'Argyle' height is comparable to other hybrids, however it usually has the largest average diameter (dbh). In a Wairarapa trial (ann. rainfall 850 mm) of 15 hybrids, 'Argyle' at age 12 had the largest average dbh of 37 cm (c.f. Weraiti 36 cm, 'Kawa' 27 cm), and an average height of 16.3 m (c.f. 'Weraiti' 17.9 m, 'Kawa' 15.4 m). This resulted in a volume index second only to 'Weraiti'. At the same age in Manawatu (ann. rainfall 1200 mm) and at age 13 in Otago (ann. rainfall 600 mm), 'Argyle' dbh averaged 29 cm and 23 cm respectively.



# 'Crowsnest'

(*Populus deltoides* x *P. nigra*) x *P. nigra*  
NZ 5010

'Crowsnest' is a New Zealand-bred PVR-licensed variety that originates from a backcross between a *P. x euramericana* hybrid and *P. nigra*. It was first released commercially in 1994.

## Identification

'Crowsnest' leaves are smaller and rounder than leaves of the *P. x euramericana* hybrids, with a leaf base that tapers towards the leaf tip. Like 'Veronese', the new leaves of 'Crowsnest' flush a dark reddish-bronze in mid-late September in Manawatu, maturing to dark green on the upper surface and light green below, with a red midrib.

The numerous side branches of 'Crowsnest' have a very steep branch angle that results in a narrow crown approaching that of Lombardy poplar. Unlike the Lombardy poplar, 'Crowsnest' is female.

## Typical uses, site requirements, pest and disease resistance

'Crowsnest' is primarily used for horticultural shelterbelts and windbreaks on small rural holdings. The branches are light and require little or no side trimming. 'Crowsnest' is used as a soil conservation tree in east coast regions, as it is reasonably drought tolerant.

'Crowsnest' has low-moderate rust and anthracnose resistance and is palatable to possums.

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# 'Dudley'

*Populus deltoides* x *P. nigra*  
NZ 5022

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'Dudley' is a *P. x euramericana* hybrid, resulting from a 1980 NZ cross between *P. deltoides* and *P. nigra* 'Italica'. It was first released commercially in 2000. A NZ PVR application is pending.

## Identification

'Dudley' leaves are very similar to those of 'Veronese', with red veins, a straight base and a slightly undulating leaf margin. The leaves are dark green above and light green below.

'Dudley' has a narrow-medium sized crown, with only a few heavy limbs. 'Dudley' is the only male in the 1980 series of *P. x euramericana* hybrids.

## Typical uses, site requirements, pest and disease resistance

'Dudley' is suitable for general soil conservation use, particularly in drier eastern regions. 'Dudley' is typically used on lower slopes, below 'Argyle' and 'Veronese'.

'Dudley' has less rust resistance than the other *P. x euramericana* hybrids, and is possum palatable.

## Performance in trials

'Dudley' ranked average amongst other clones in trials at Wairarapa (ann. rainfall 850 mm) and Otago (ann. rainfall 600 mm). In Wairarapa, 'Dudley' at age 12 had an average diameter (dbh) of 30 cm (c.f. Weraiti 36 cm, 'Kawa' 27 cm), and an average height of 16.2 m (c.f. 'Weraiti' 17.9 m, 'Kawa' 15.4 m). However at the same age in Manawatu (ann. rainfall 1200 mm) average dbh for 'Dudley' was 22 cm (12th lowest of the 14 named clones).





# 'Fraser'

*Populus deltoides x P. nigra*  
NZ 5017

'Fraser' is a *P. x euramericana* hybrid, resulting from a 1980 NZ cross between *P. deltoides* and *P. nigra* 'Italica'. It was first released commercially in 1996.

## Identification

'Fraser' leaves are very similar to those of 'Veronese', with red veins, a straight base and a slightly undulating leaf margin. The leaves are dark green above and light green below.

'Fraser' has a narrow-medium sized crown, with only a few heavy limbs. 'Fraser' is female.

## Typical uses, site requirements, pest and disease resistance

'Fraser' is suitable for general soil conservation use, particularly in drier eastern regions. 'Fraser' is typically used on lower slopes, below 'Argyle' and 'Veronese'.

'Fraser' has less rust resistance than the other *P. x euramericana* hybrids, and is possum palatable.

## Performance in trials

'Fraser' ranked average amongst other clones in trials at Wairarapa (ann. rainfall 850 mm) and Otago (ann. rainfall 600 mm). In Wairarapa, 'Fraser' at age 12 had an average diameter (dbh) of 30 cm (c.f. 'Weraiti' 36 cm, 'Kawa' 27 cm), and an average height of 17.0 m (c.f. 'Weraiti' 17.9 m, 'Kawa' 15.4 m). At Henley in Otago at the same age average dbh for 'Fraser' was 17 cm (23.8 for 'Weraiti' and 20.7 cm for 'Otahuao') and height was 13.6 m (14.4 m for 'Weraiti' and 11.6 m for 'Otahuao').



# 'Otahuao'

*Populus deltoides* x *P. nigra*  
NZ 5020

'Otahuao' is a *P. x euramericana* hybrid, resulting from a 1980 NZ cross between *P. deltoides* and *P. nigra* 'Italica'. It was first released commercially in 1993.

## Identification

'Otahuao' leaves have a straight base and a distinctive undulating or wrinkled leaf margin. The leaves are dark green above and light green below. As a young tree 'Otahuao' has smoother bark than the other *P. x euramericana* hybrids.

'Otahuao' has a medium sized crown, a heavy stem and occasionally a few heavy branches. 'Otahuao' is female.

## Typical uses, site requirements, pest and disease resistance

'Otahuao' is suitable for soil conservation, particularly in eastern regions. It has good wind and drought tolerance and can be used in the lower slopes, below 'Argyle' and 'Veronese'.

'Otahuao' is less susceptible to rust than varieties 'Dudley' and 'Selwyn' - it was the only clone that stayed rust-free in Wairarapa in 2003-04. 'Otahuao' is possum palatable.

## Performance in trials

In a Wairarapa trial (ann. rainfall 850 mm) of 15 hybrids, 'Otahuao' at age 12 had an average dbh of 34 cm (c.f. 'Weraiti' 36 cm, 'Kawa' 27 cm), and an average height of 16.1 m (c.f. 'Weraiti' 17.9 m, 'Kawa' 15.4 m). This resulted in the fourth highest volume index, behind 'Weraiti', 'Argyle' and 'Margarita'. At age 12 in Manawatu (ann. rainfall 1200 mm) 'Otahuao' dbh averaged 27 cm, and at age 13 in Otago (ann. rainfall 600 mm), average dbh was 21 cm.

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# 'Selwyn'

*Populus deltoides* x *P. nigra*  
NZ 5016

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'Selwyn' is a *P. x euramericana* hybrid, resulting from a 1980 NZ cross between *P. deltoides* and *Populus nigra* 'Italica'. It was first released commercially in 1995.

## Identification

'Selwyn' leaves are roughly heart-shaped, similar to 'Veronese', with a straight base and a slightly undulating leaf margin. The leaves are dark green above and light green below.

'Selwyn' is a female tree with a very narrow form, light branching, and sometimes a wavy stem growth due to wind.

## Typical uses, site requirements, pest and disease resistance

'Selwyn' is suitable for general soil conservation use. It has excellent drought resistance and is typically used on slopes, in similar zones to 'Argyle' and 'Crowsnest'. It can be brittle.

'Selwyn' has less rust resistance than the other *P. x euramericana* hybrids. 'Selwyn' is possum palatable.

## Performance in trials

Growth rates of 'Selwyn' are generally slightly lower than the *P. x euramericana* hybrids 'Weraiti' and 'Otahuao', but are comparable to 'Fraser' and 'Dudley'. In a Wairarapa trial (ann. rainfall 850 mm), 'Selwyn' at age 12 had an average diameter (dbh) of 28 cm (c.f. 'Weraiti' 36 cm, 'Kawa' 27 cm), and an average height of 16 m (c.f. 'Weraiti' 17.9 m, 'Kawa' 15.4 m). At the same age in Manawatu (ann. rainfall 1200 mm) and at age 13 in Otago (ann. rainfall 600 mm), 'Selwyn' dbh averaged 25 cm and 19 cm respectively.

Whilst 'Selwyn' has slower height growth than the *P. x euramericana* hybrids 'Weraiti', and 'Dudley' in recent trials (Otago, Canterbury, Manawatu, Hawkes Bay, Te Kuiti and Auckland), it has the best survival rate, with deaths only numbering 4% of poles planted.



# 'Veronese'

*Populus deltoides* x *P. nigra*

PN 870

'Veronese' is a *P. x euramericana* hybrid that was bred in Italy, imported into New Zealand and released commercially in 1986.

## Identification

'Veronese' leaves are dark green on the upper surface and light green below, with a red midrib. In Manawatu, leaf-fall occurs in April, and the trees flush a bronze-red in mid September. The leaves hang at a vertical angle to the stem (see photo).

'Veronese' is a female tree with a narrow crown and excellent apical dominance.

## Typical uses, site requirements, pest and disease resistance

'Veronese' is used for soil conservation, windbreaks, stock fodder and timber production. 'Veronese' has a high water-use-efficiency, and therefore it is relatively drought tolerant compared with other poplars. It is commonly used on windy and exposed sites, along with the variety 'Argyle'.

'Veronese' is not very resistant to the poplar rust or leaf anthracnose, a further reason for planting in dry sites less conducive to disease.

'Veronese' is not possum resistant.

## Performance in trials

At age 8 on a wet exposed site in Manawatu (ann. rainfall 1200 mm), pruned Veronese' at 8 m spacings had an average height of 10.4 m and diameter (dbh) of 18 cm (below left). At the same age widely-spaced 'Veronese' on a good site in Tauranga (ann. rainfall 1300 mm) had an average height of 12.0 m and a dbh of 21 cm.

In a Fan Nelder trial in Waipukurau (ann. rainfall 900 mm), age 8 'Veronese' trees spaced 4 - 11 m apart had an average height of 10.7 m and a dbh of 17 cm.

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# 'Weraiti'

*Populus deltoides* x *P. nigra*  
NZ 5018

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'Weraiti' is a *P. x euramericana* hybrid, resulting from a 1980 NZ cross between *P. deltoides* and *P. nigra* 'Italica'. It was first released commercially in 1996.

## Identification

'Weraiti' leaves are similar in shape to 'Veronese' with a straight base and a slightly undulating leaf margin. The leaves are dark green above and light green below.

'Weraiti' has a narrow-medium sized crown with excellent leader dominance, a heavy stem and occasionally a few heavy branches. 'Weraiti' is female.

## Typical uses, site requirements, pest and disease resistance

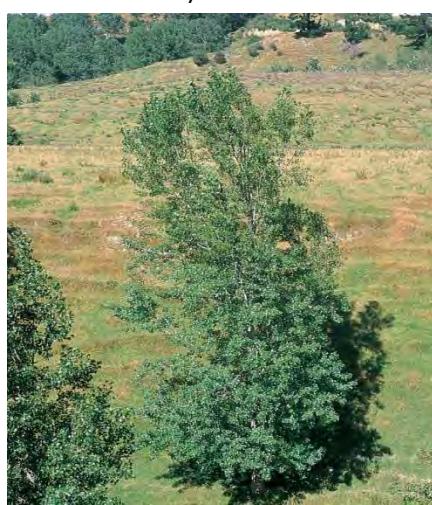
'Weraiti' is suitable for soil conservation and timber production, particularly in eastern regions. It has good wind and drought tolerance and can be used in the lower slopes, below 'Argyle' and 'Veronese'.

'Weraiti' is susceptible to rust and possums, but less so than varieties 'Dudley' and 'Selwyn'.

## Performance in trials

Growth rates of 'Weraiti' rank alongside 'Argyle' as the highest of the 1980 series of *P. x euramericana* hybrids. In a Wairarapa trial (ann. rainfall 850 mm), 'Weraiti' at age 12 had an average diameter (dbh) of 36 cm (c.f. 'Argyle' 37 cm, 'Kawa' 27 cm). However it was the tallest variety, with an average height of 17.9 m (c.f. 'Argyle' 16.3 m, 'Kawa' 15.4 m). At age 12 in Manawatu (ann. rainfall 1200 mm) and at age 13 in Otago (ann. rainfall 600 mm), 'Weraiti' dbh averaged 26 cm and 24 cm respectively.

'Weraiti' is performing well in established Canterbury, Manawatu, Hawkes Bay and Auckland trials, however it is significantly slower growing than the *P. maximowiczii* x *P. nigra* hybrids and 'Shinsei' in the wetter climate of Te Kuiti (ann. rainfall 1500 mm).





# 'Kaimai'

*Populus deltoides x P. ciliata*  
NZ 5025

'Kaimai' is a *P. x asiamerica* hybrid, resulting from a 1983 NZ cross between *P. deltoides* and *P. ciliata*. It was first released commercially in 2011.

## Identification

'Kaimai' leaves are ....Strong apical dominance



## Typical uses, site requirements, pest and disease resistance

'Kaimai' is suitable for general soil conservation use, particularly in drier eastern regions. It does not suit windy environments.

'Kaimai' has low to medium rust resistance which can lead to early season defoliation in western regions



## Performance in trials

In a close-planted trial at Lawrence 'Kaimai' at age 12 (24) height and DBH were measured at 19.1 (30.5) m and 34.2 (49.9) cm. At the same site 'Veronese' at age 24 was 27.7 m tall and with DBH of 48.5 cm. 'Kaimai' was the most vigorous of the *deltoides* × *ciliata* clones at Lawrence





# 'Rotorangi'

*Populus deltoides x P. ciliata*  
NZ 5027

'Rotorangi' is a *P. x asiamerica* hybrid, resulting from a 1983 NZ cross between *P. deltoides* and *P. ciliata*. It was first released commercially in 2011.

## Identification

Strong apical dominance

Retains its leaf longer than other del-ciliata clones.



## Typical uses, site requirements, pest and disease resistance

'Rotorangi' is suitable for general soil conservation use, particularly in drier eastern regions. It copes better than other *deltoides*-*ciliata* clones in windy sites including coastal sites

'Rotorangi' has medium-high rust resistance.

## Performance in trials

'Rotorangi' in a close-planted trial at Lawrence had a mean height of 15.3 (25.5) m and DBH of 28.9 (42.4) cm after 12 (24) years. It is not as vigorous as the other *deltoides* × *ciliata* clones and less likely to develop heavy branches.





# 'San Rosa'

*Populus deltoides x P. ciliata*  
NZ 5026

'San Rosa' is a *P. x asiamerica* hybrid, resulting from a 1983 NZ cross between *P. deltoides* and *P. ciliata*. It was first released commercially in 2011.

## Identification

'San Rosa' leaves are very similar to those of 'Veronese', with red veins, a straight base and a slightly undulating leaf margin. The leaves are dark green above and light green below.

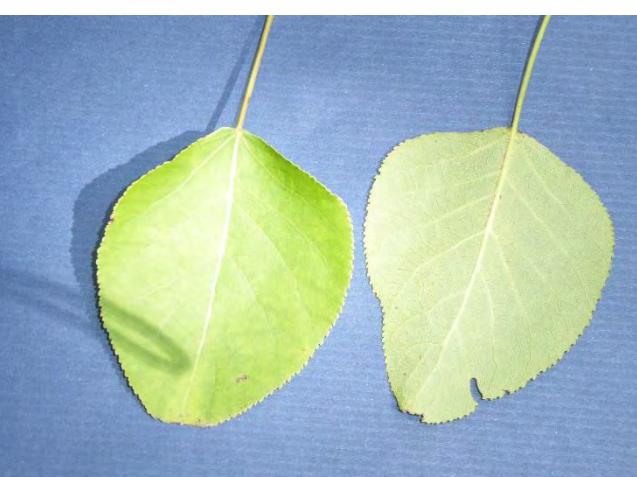
'San Rosa' has a narrow-medium sized crown, with a tendency to produce at least one heavy limb. IN general limbs are light. 'San Rosa' is male.

## Typical uses, site requirements, pest and disease resistance

'San Rosa' is suitable for general soil conservation use, particularly in drier eastern regions. It performs better in sheltered sites. It has low-medium resistance to rust which offsets its vigour in western regions.

## Performance in trials

'San Rosa' in a close-planted trial at Lawrence had a mean height of 17.8 (27.9) m and DBH of 34.0 (49.5) cm after 12 (24) years.



# 'Yunnan'

*P. yunnanensis*, The Chinese poplar  
PN 35

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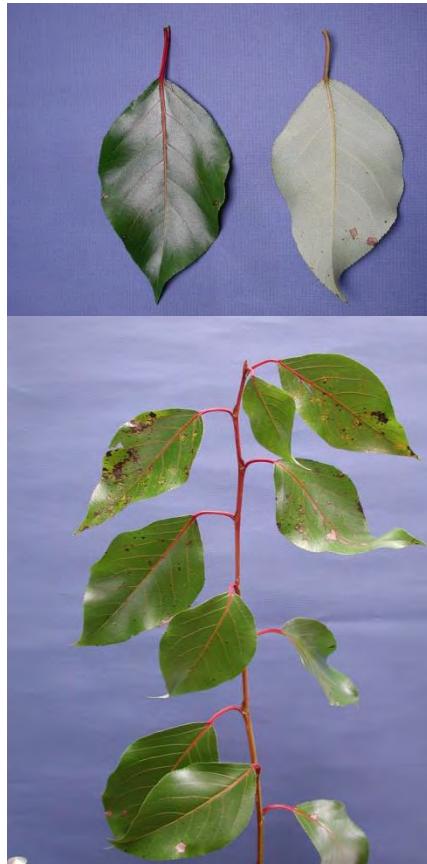


"Yunnan" is a single clone of the balsam poplar *P. yunnanensis* from the Yunnan province in China. It was first imported in 1908, and was released for general use in 1986.

## Identification

'Yunnan' leaves are oval or egg-shaped, rounded or wedge shaped at the base, with a long pointed tip. The leaves are glossy green on the upper surface and white-grey below, and the leaf midrib and stalk is pink-red. The bark is initially smooth and sheds brown flakes annually, but roughens in trees over 15 years old. The buds are sticky and the trees have a strong balsam scent in Spring. Due to it's sub-tropical origins 'Yunnan' has a long leafing period, from mid October to mid June. It is the last poplar to shed it's leaves in Autumn.

On sheltered sites 'Yunnan' develops into a tall, broad-crowned, heavily-branched tree up to 30 m in height. 'Yunnan' is male.



## Typical uses, site requirements, pest and disease resistance

'Yunnan' performs well on fertile, moist, friable soils. It is useful for hillside stabilisation and gully control, particularly in areas where rust diseases are a problem on other varieties. 'Yunnan' can be difficult to establish as a pole, but once established it has excellent drought resistance. It is popular as an ornamental tree due to its attractive foliage, balsam scent and long leafing period. As a young tree 'Yunnan' is not as frost-hardy as most other varieties, and the fastest growth rates are seen in northern parts of New Zealand.

'Yunnan' has excellent resistance to the poplar rusts, and is not palatable to possums.

## Performance in trials

On favourable sites growth is up to 2 m in the first year, and drops to 1-2 m in succeeding years. 'Yunnan' is slower growing than the hybrids 'Kawa' and 'Toa'.



# 'Kawa'

*Populus deltoides* x *P. yunnanensis* 'PN 35' NZ 5006

'Kawa', bred in NZ in 1974, is a cross between *P. deltoides* and *P. yunnanensis* from China. It was released commercially in 1986.

## Identification

'Kawa' leaves are heart-shaped, and green on the upper surface and pale grey-green below. The midrib and petiole are tinged pinkish red on the upper surface. Due to the *P. yunnanensis* parentage, the leaves remain on the tree for much longer than the *P. x euramericana* hybrids, and turn bright yellow before leaf fall.

'Kawa' has a narrow crown, excellent apical dominance, and a high basic density of 360 kg/cubic metre. 'Kawa' is male.

## Typical uses, site requirements, pest and disease resistance

'Kawa' favours moist areas that do not get excessive wind, and is not very frost tolerant. It is suitable for soil conservation, amenity purposes, firewood blocks and timber. 'Kawa' should be planted in sheltered sites such as valley floors, gullies and terraces. It is widely used in western and northern regions of New Zealand.

It has good possum resistance, and rust resistance in most situations.

## Performance in trials

Widely-spaced age 9 'Kawa' at two moist fertile river terrace sites in Gisborne (ann. rainfall 1100 mm) had an average height and diameter (dbh) of 17.3 m and 24 cm respectively, while the same-aged trees replicated in a trial on exposed hill country had an average height and dbh of 13.5 m and 22 cm.

The Fan Nelder trial (below left) is age 7 on a sheltered site in Gisborne, and average height is 14.5 m and dbh is 18 cm for trees spaced at 4-11 m apart.

Similar growth rates of 2 - 2.5 m per year have been recorded in the Bay of Plenty, Waikato, and Northland. Lower growth rates of 1 - 1.5 m per year are more typical in cooler or drier regions such as Manawatu, Wairarapa and Hawkes Bay.

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# 'Toa'

(*Populus deltoides* x *P. nigra*) x *P. yunnanensis* NZ  
5007

'Toa' is a NZ-bred PVR-licensed tree that was first released commercially in 1996. It originates from a 1982 cross between a *P. x euramericana* hybrid and the Chinese balsam poplar *P. yunnanensis*.

## Identification

'Toa' leaves are round with a straight to shallowly heart-shaped leaf base. The leaves are dark green on the upper surface and grey-green below, with a pink tinge on the midrib. Similar to 'Kawa', the leaves remain on the tree until early winter, much longer than the *P. x euramericana* hybrids due to the *P. yunnanensis* parentage.

'Toa' has a narrow-medium sized crown, and is heavier in the trunk than 'Kawa'. 'Toa' is female.

## Typical uses, site requirements, pest and disease resistance

'Toa' is suited to moist and fertile sites, even more so than the variety 'Kawa', however it will withstand some wind. 'Toa' is recommended for soil conservation in wet sheltered valley systems.

'Toa' is typically rust resistant, and the balsam parentage confers good possum resistance.

## Performance in trials

At a Fan Nelder trial on a moist but exposed site in Manawatu (ann. rainfall 1200 mm), age 7 'Toa' had an average height of 10.2 m and diameter (dbh) of 17 cm for trees spaced at 4 - 11 m apart. However this trial had been badly damaged by stock.

At a spacing trial near Wairoa (ann. rainfall 1250 mm), age 9 'Toa' had an average height of 17.8 m, and a dbh of 34 cm for trees spaced from 5 x 5 m – 10 x 10 m.

Plant & Food  
RESEARCH

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