Ribbonwood

Plagianthus betulinus regius

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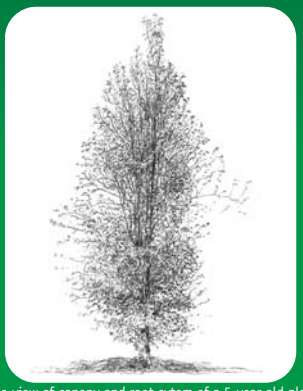
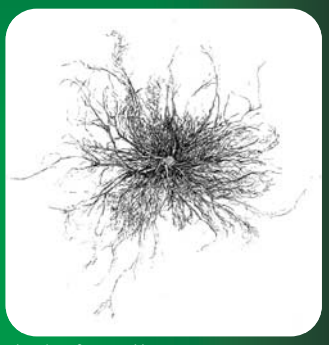
Introduction and Methods

The composition and extent of stream-side vegetation influences how well a riparian area functions and hence has a major impact on the state of streams. Though the role of exotic woody species such as willow is well recognised for improving bank stability, information on the performance of native woody species is limited. Thus, there is a need to quantify their effectiveness particularly as stream restoration enhancement projects involving native species increase in popularity.



Side view of canopy and root sytem of a 5-year old plant (see text box for dimensions)

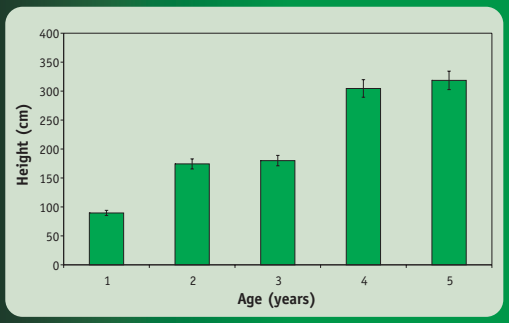
A trial was established in 1999 to assess growth performance of twelve 1 to 5 year-old native riparian plant colonisers. Ten plants were extracted each year and growth parameters measured.



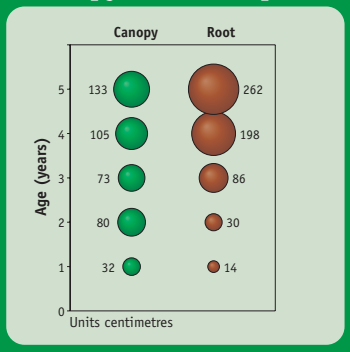
Plan view of 5-year old root system (see text box for dimensions)

Results

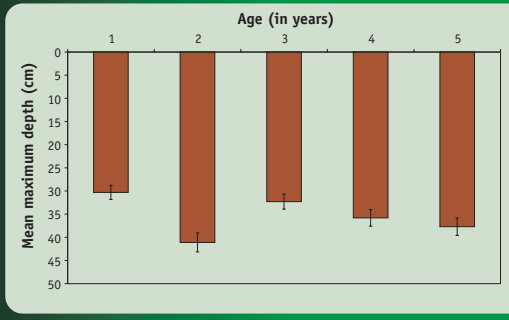
Tree Height



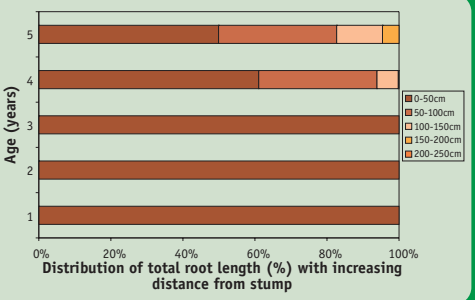
Canopy and Root Spread



Root Depth



Root Length Distribution



Distribution and Site Preferences

Occurrence	Mangonui (North Island) to Stewart Island
Local occurrence	riverbanks, alluvial terraces, in coastal and lowland forest margins
Altitudinal range	sea-level to 450 m
Preferred soils	fertile alluvial soils
Moisture	moist climates (>1000 mm/yr)
Properties	not tolerant hard frosts or severe drought, extremely wind-tolerant

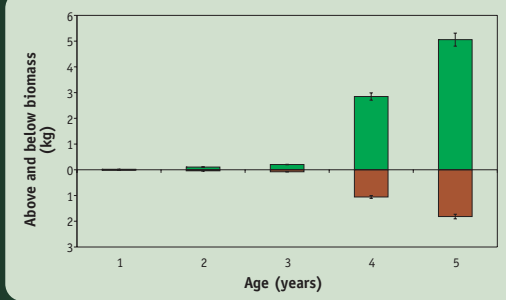
Summary of growth characteristics at age 5

Mean height	3.2 m, 10 to 15m in adult trees
Mean canopy	1.3 m
Mean root spread	2.6 m
Max. root depth	0.4 m
Mean above ground biomass	5 kg
Mean below ground biomass	1.8 kg

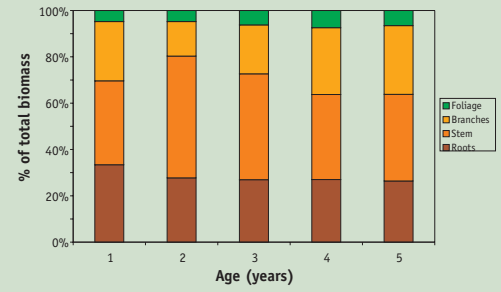
Notes: Rapid early growth rate and erect, tall habit make it suitable for mid-tier shelter and so should be planted in conjunction with a lower stature species. Roots have low (mean: 21.59 MPa) tensile strength (Watson, A., Marden, M. 2004).

Suitable for streamside stabilisation of small streams with stable banks and in conjunction with other species. Its shallow rooting depth makes it unsuitable for riverbank stabilisation in situations where bank height likely exceeds the maximum rooting depth (<2 m) of adult trees.

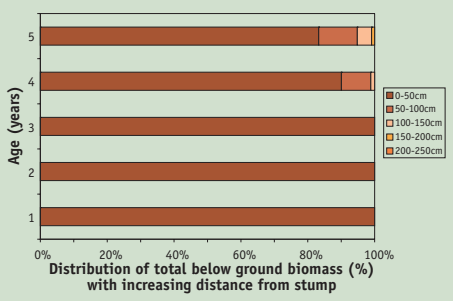
Biomass



Total Plant Biomass



Root Biomass Distribution



References

Marden. M., Rowan, D & Phillips, C. 2005: Stabilising characteristics of New Zealand indigenous riparian colonising plants. *Plant and Soil* 278 (1–2): 95–105.

Pollock, K. M. 1986: Plant Materials Handbook for Soil Conservation. Volume 3: Native Plants. Water and Soil Miscellaneous Publication No. 95, 66p.

Watson, A., Marden, M. 2004: Live root-wood tensile strengths of some common New Zealand indigenous and plantation tree species. *New Zealand Journal of Forestry Science* 34(3): 344–353.

Acknowledgements

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http://icm.landcareresearch.co.nz/science_themes/freshwater/stabilising_characteristics_of_nz_native_riparian_plants.htm