

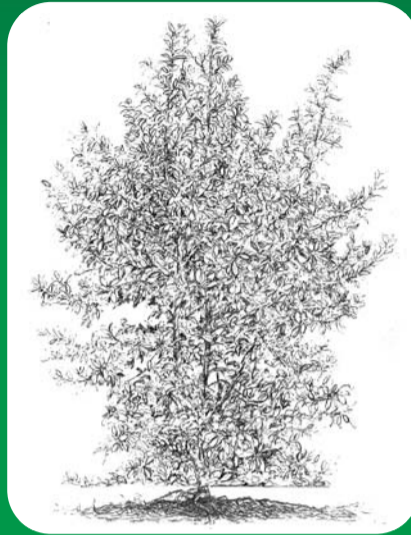
Karamu *Coprosma robusta*

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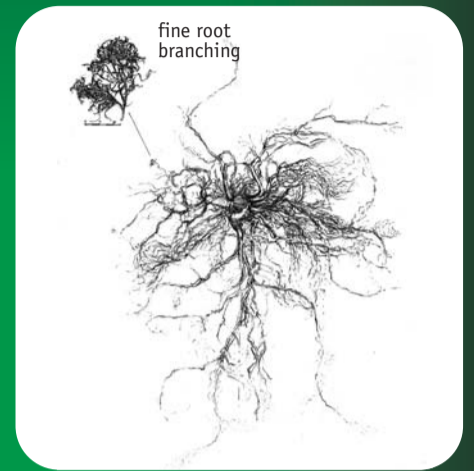
Introduction and Methods

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 system of a 5-year old plant (see text box for dimensions)

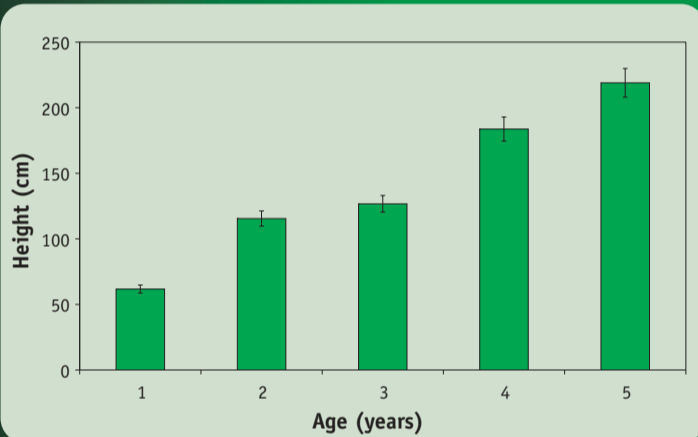
A trial was established in 1999 to assess growth performance of twelve 1 to 5 year-old native riparian plant colonisers. Ten plants were extracted each year and growth parameters measured.



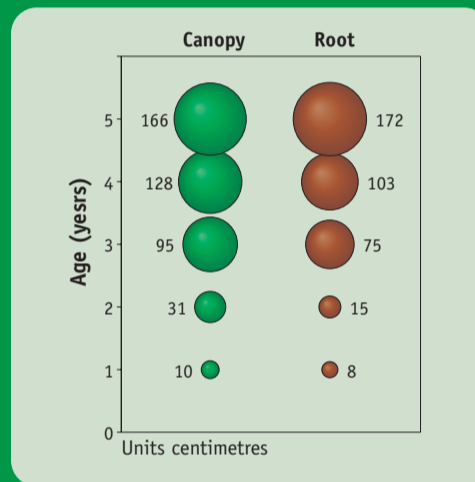
Plan view of 5-year old root system (see text box for dimensions)

Results

Tree Height



Canopy and Root Spread



Distribution and Site Preferences

| | |
|--------------------------|---|
| Occurrence | North and South Islands |
| Local occurrence | montane and lowland forests, coastal and lowland swamp, scrubland |
| Altitudinal range | sea-level to 1200 m |
| Preferred soils | most soils |
| Moisture | not very dry soils |
| Properties | tolerates shade and full sun equally, wind hardy but doesn't tolerate persistent and strong wind. |

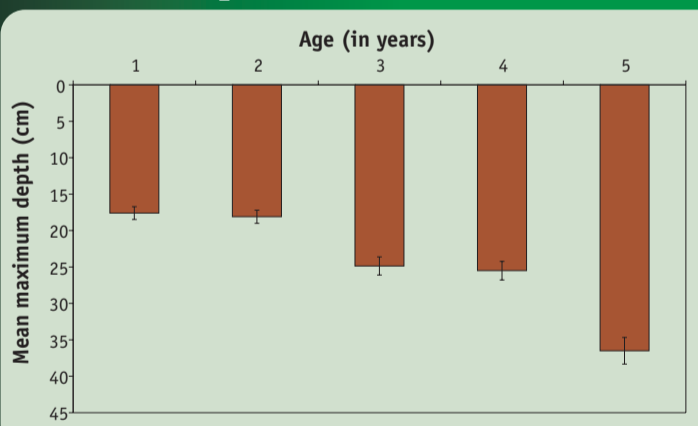
Summary of growth characteristics at age 5

| | |
|----------------------------------|---------------------------|
| Mean height | 2.2 m, 6 m in adult trees |
| Mean canopy | 1.7 m |
| Mean root spread | 1.7 m |
| Max. root depth | 0.4 m |
| Mean above ground biomass | 4.8 kg |
| Mean below ground biomass | 1.3 kg |

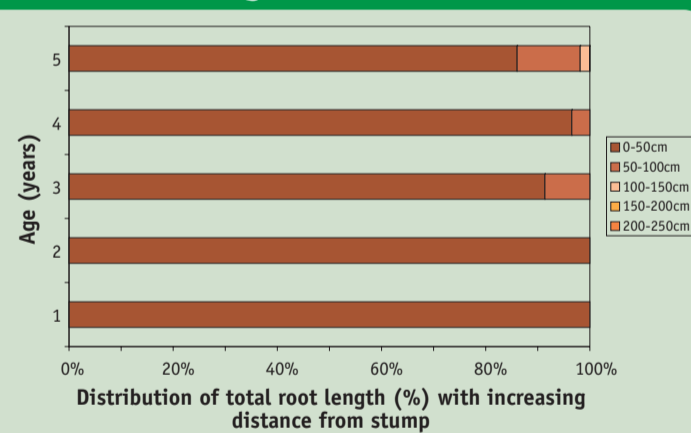
Notes: Spreading shrub commonly found on roadsides throughout forest regions. Roots are fleshy and have low (mean: 8.38 MPa) tensile strength (Watson, A., Marden, M. 2004). However its compact, dense and fibrous root system make it a good soil stabiliser. Fast early growth provides ideal low-tier shelter for emerging taller species or as understorey beneath taller trees. Suitable for general revegetation on bare infertile soils or subsoils on barren sites but if planted too closely it will suppress adjacent slower-growing species. Palatable to browsing mammals but only slightly palatable to opossums.

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

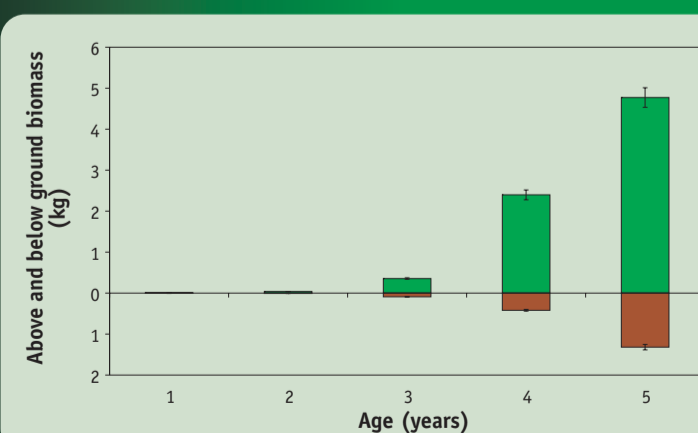
Root Depth



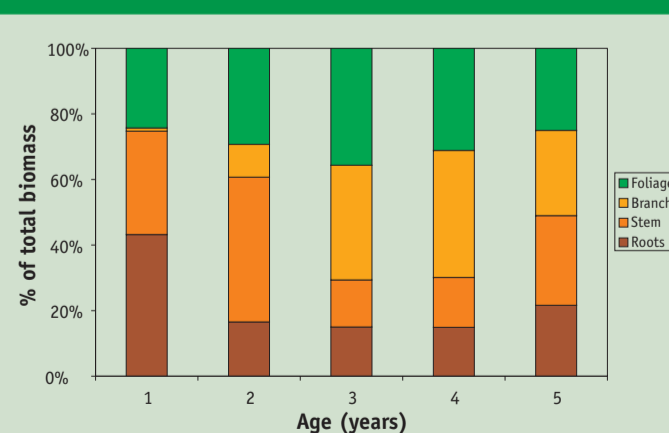
Root Length Distribution



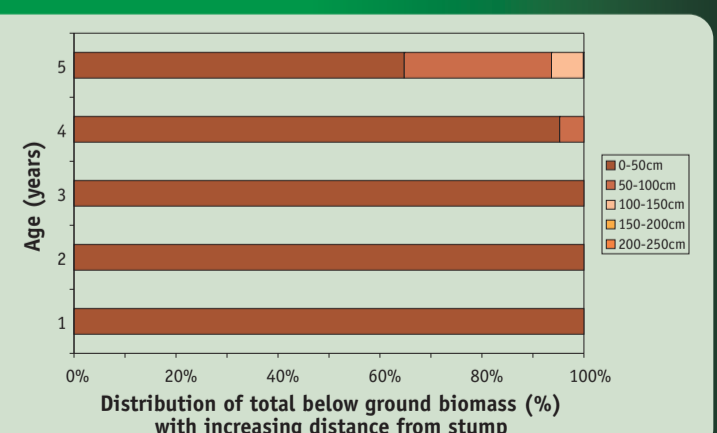
Biomass



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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- Sketches by Gisborne artist Graeme Mudge.
- http://icm.landcareresearch.co.nz/science_themes/freshwater/stabilising_characteristics_of_nz_native_riparian_plants.htm