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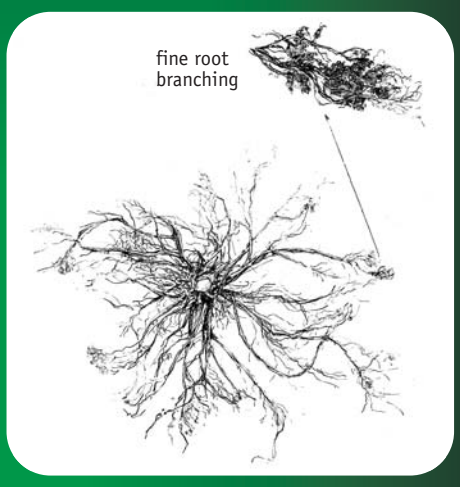
Rewarewa *Knightia excelsa*

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)

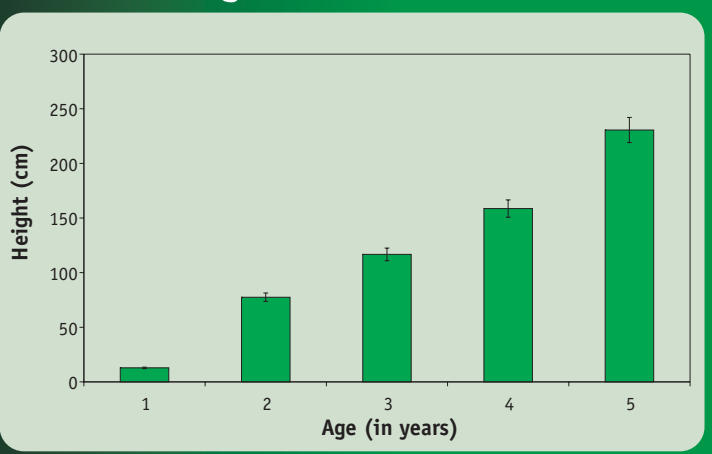
A trial was established in 1999 to assess growth performance of twelve 1 to 5 year-old native riparian plant colonisers. Ten plants were extracted each year and growth parameters measured.



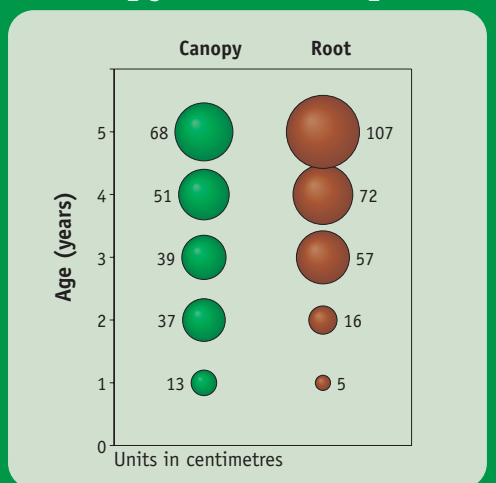
Plan view of 5-year old root system (see text box for dimensions)

Results

Tree Height

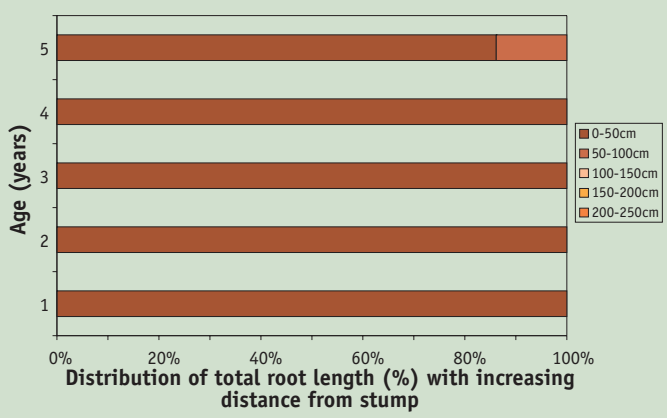


Canopy and Root Spread



Root Depth

Root Length Distribution



Distribution and Site Preferences

Occurrence	North Island and Marlborough Sounds
Local occurrence	lowland and montane forests, in scrubland and cutover forest
Altitudinal range	sea-level to 900 m
Preferred soils	friable soils
Moisture	well-drained soils
Properties	pioneer species, tolerates seasonal drought, and moderate frost, unpalatable to browsing animals

Summary of growth characteristics at age 5

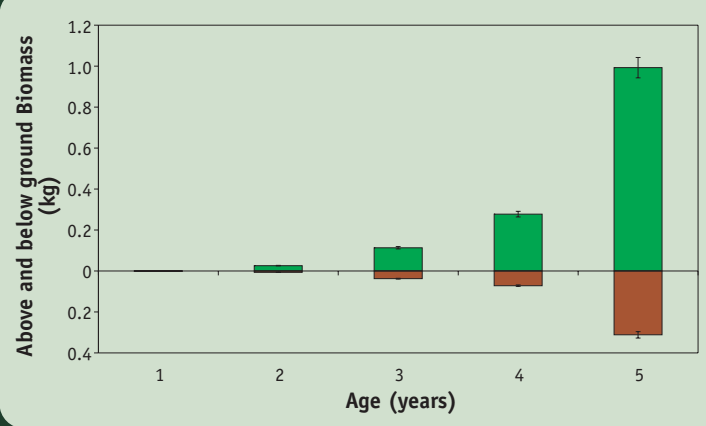
Mean height	2.3 m, up to 30 m in adult trees
Mean canopy	0.7 m
Mean root spread	1 m
Max. root depth	0.3 m
Mean above ground biomass	1 kg
Mean below ground biomass	0.3 kg

Notes: It is a true pioneer species yet has a considerable lifespan. It is suitable for shelter but is not fast growing on poorer sites. Under good conditions it will grow about 0.5 m per year. It is vunerable to fire. Roots have moderate (mean: 26.83 MPa) tensile strength (Watson, A., Marden, M. 2004).

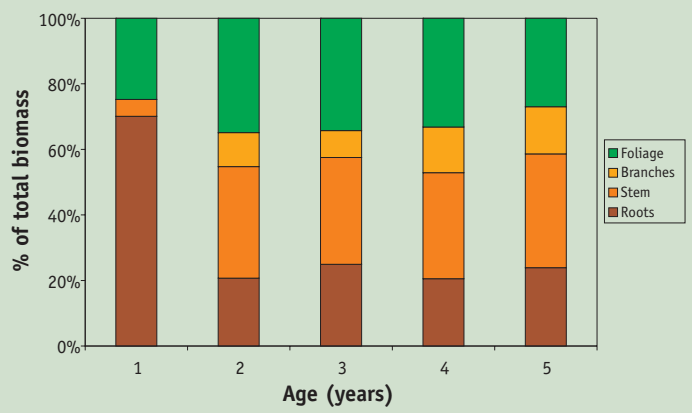
Suitable for streamside stabilisation of small streams with stable banks and in conjunction with other species. Adult trees supposedly have a deep tap-root (depth unspecified) which can penetrate some subsoil pans and may have some potential to control or prevent slip erosion but this has not been evaluated.

May prove suitable for riverbank stabilisation of larger rivers provided that bank height does not exceed the maximum rooting depth of adult trees. In a forest situation it provides a good environment for future forest species and could be used more in vegetation restoration work.

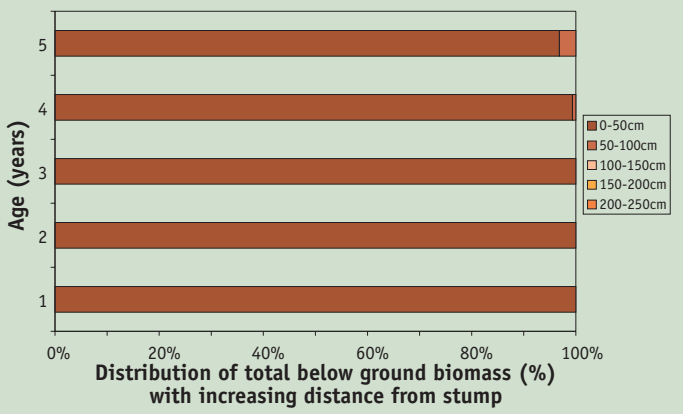
Biomass



Total Plant Biomass



Root Biomass Distribution



References

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Acknowledgements

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