# Kowhai *Sophora tetraptera*

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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)

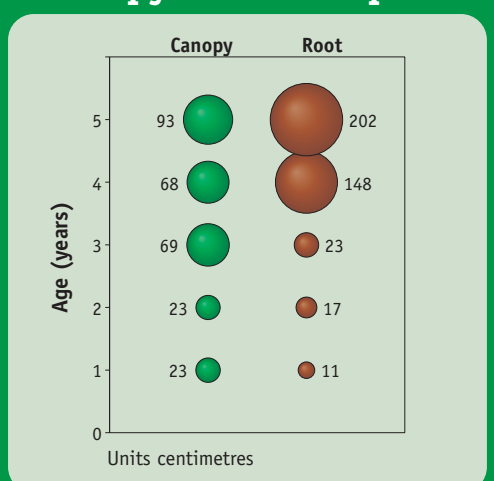
A trial was established in 1999 to assess growth performance of twelve 1 to 5 year-old native riparian plant colonisers. Ten plants were extracted each year and growth parameters measured.

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

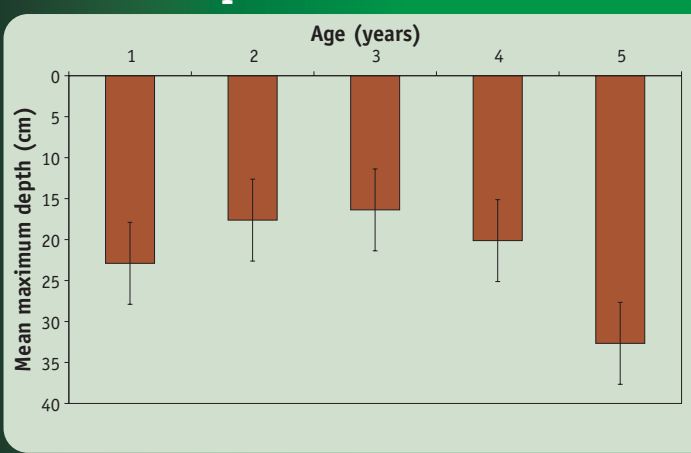
## Results

### Tree Height

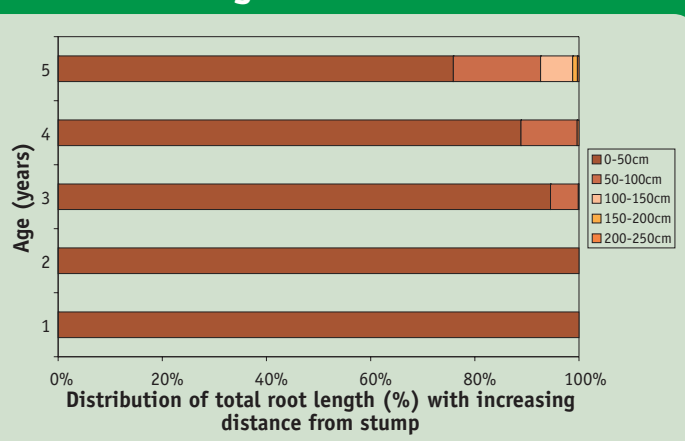

### Canopy and Root Spread




### Root Depth




### Root Length Distribution




### Distribution and Site Preferences

| | |
|---|---|
| **Occurrence** | North and South Islands |
| **Local occurrence** | lowland and lower montane regions, open forests, along rivers and forest margins |
| **Altitudinal range** | sea-level to 800 m |
| **Preferred soils** | most soils but not subsoils |
| **Moisture** | prefers dry sites but tolerates most moisture conditions |
| **Properties** | frost hardy, tolerates moderate wind but is not suitable for exposed sites |

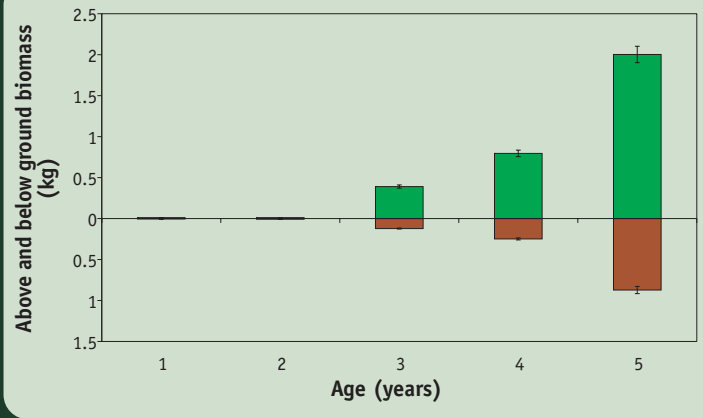
### Summary of growth characteristics at age 5

| | |
|---|---|
| **Mean height** | 2.6 m, 12 m in adult trees |
| **Mean canopy** | 0.9 m |
| **Mean root spread** | 2 m |
| **Max. root depth** | 0.3 m |
| **Mean above ground biomass** | 2 kg |
| **Mean below ground biomass** | 0.9 kg |

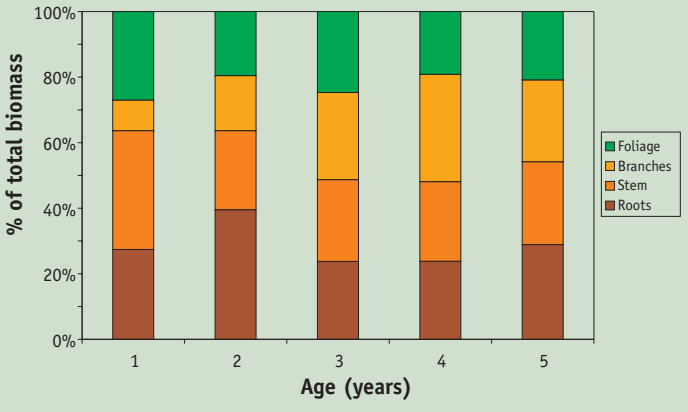
**Notes:** Ideal for moderately fertile roadsides and most disturbed but stable sites where long term protection is required. Root nodules contain nitrogen-fixing fungi. Best planted in conjunction with faster-growing but short lived shelter species. Spindly, long reaching, shallow roots with high (mean: 43.72 MPa) tensile strength (Watson, A., Marden, M. 2004) make it ideally suited to steep cliff sites with exposed fractured rock.

Suitable for streamside stabilisation in small streams with stable banks and in conjunction with other trees. 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.

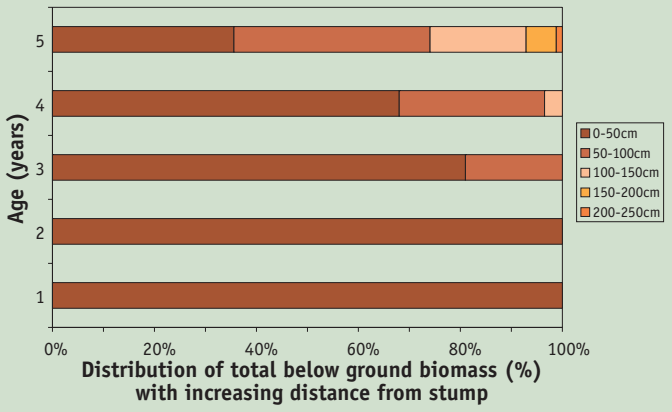
### Biomass




### Total Plant Biomass




### Root Biomass Distribution




### References

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