

native hardwoods forestry trial

MAx McFarlane

# Background

The Sustainable Agriculture Innovative Forestry Trials aim to demonstrate new innovations for forestry management and production in the Mackay, Whitsunday and Isaac regions.

Max McFarlane has a cane farm located near Bloomsbury on the O'Connell River, he has the aim to use his unsuitable cane lands for hardwood forestry. Just below this area, Max has completed a systems repair project on the O’Connell with re-vegetation to assist in stream bank stabilisation. The trial will be used to demonstrate the use of unsuitable cane lands for native forestry and to see which species perform best. The land type is Alluvial and quite rocky and the trial site is approximately 0.5 Ha (desktop quick assessment). Current Remnant 2011 Regional Ecosystem (RE) mapping identifies the area as non-remnant vegetation, cultivated or built environment. However, the pre-clearing RE is identified as 8.3.6, which is endangered under the biodiversity status classification. Very little remains of this vegetation type due to its occurrence on very fertile alluvial soils, which have mainly been cleared for agriculture. Below are google images of both the area for the trial and the area in relation to the whole of farm boundary.

  The area for trial site The whole property boundary

# Trial Overview & Design

## Current Site Information

* Total area of Property: 180 Ha;
* Area Impacted on: 0.5 Ha approx.;
* Soil Depth: extremely deep without a clay base;
* Soil Structure: friable, sandy loam with pebbles and larger rocks;
* Rainfall Annually: 1250mm;
* Wind direction is typically from the South East;
* Management of area: currently being slashed; and
* Current Vegetation Species in the riparian zone include:

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| --- |
| Narrow leaf Paper bark *Melaleuca leucadendra* |
| Pink Bloodwood *Corymbia intermedia* |
| Ribbon Wood *Euroschinus* |
| Moreton bay ash *Corymbia tessellaris*. |
| Blue Gum *Eucalyptus tereticornis* |
| Ivory Mahogany *Dysoxylum gaudichaudianum* |
| Blue Quandong *Elaeocarpus grandis* |

## Trial Design

Area: 0.5ha approx.

Proposed Layout:

Randomised completed block design 6 species X 3 replications, each plot per rep 20 trees

Rip line direction

N

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| --- | --- | --- | --- |
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See Map re proposed design. Rep 1: plots 1-6, Rep 2: plots 7-12, Rep 3: plots 13-18

Spacing:

4m (between rip lines) X 2.5m (along rip lines).

Soil Type

The soil type is a sandy, stony, multi-layered, recent alluvial soil that has formed on the active levee of the O’Connell River. The topsoil is a thin (0.1 m), black, loamy fine sand that has 20 – 50% of small to large (6 to 200 mm), rounded gravels. It overlies a thin (0.15 m), dark brown, loamy fine sand subsoil that contains 10 – 20% of smaller (2-60 mm) rounded gravels that overlies buried soil horizons at 0.25 m. The buried soil materials consist of a thin (0.15 m), very dark grey brown, clayey fine sand that overlies a very stony, dark brown, sandy clay loam former subsoil that extends to at least 1 m. Sampling of this layer was to limited to 1 m by the very many (>50%), large (60 – 600 mm) rounded stones present. All horizons are slightly acidic with a pH of 6 to 6.5. As this soil is sandy and stony it is freely draining internally, but has a low (50 mm/m) water holding capacity. It is equivalent to the Murray soil of the Mackay Sugarcane soil study.

The analytical data in the table below shows that the topsoil is acidic with very low levels of soluble salts and has good fertility with very high available phosphorous, moderate total nitrogen and sulphate - sulphur, but low organic carbon levels. Cations are at moderate levels except for potassium, which is low, while the copper and zinc trace elements are low while manganese and iron levels are moderate.

**Table 1. Soil analytical data for 0 – 0.1 m**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| pH | ECmS/cm | Org. C% | Total N% | Acid Pmg/kg | Sulfate – Smg/kg | ECECmeq/100g | Cameq/100g | Mgmeq/100g | Kmeq/100g | Nameq/100g | Cumg/kg | Znmg/kg | Mnmg/kg | Femg/kg |
| 5.9 | 0.045 | 1.3 | 0.107 | 87 | 4.5 | 5 | 3.7 | 1.1 | 0.22 | 0.07 | 0.3 | 0.39 | 7.1 | 42 |
| acid | v low | low | mod | v high | mod | mod | moderate | moderate | low | low | low | low | mod | mod |

Site Preparation & Establishment

* Rip along tree lines
* Layout plots ( require 32 star pickets for corner pegs to mark plots)
* Spray along rip lines prior to planting
* Mark out plots
* Assist with planting

Resources

* Soil auger (to check for heterogeneity asap re reps)
* Pegs/ steel posts to mark plots
* Compass (if mobile phone compass doesn’t work on site)
* Prism (to measure right angles when laying out plots)

Species

Species were selected based on reports of previous farm forestry trials in the Mackay Whitsunday area. Seed has been purchased where possible from commercial forestry seed suppliers (to ensure parents are of good genetics) and are being propagated through a commercial forestry nursery and include:

* *Eucalyptus cloeziana* – Gympie messmate – northern and southern provenances
* *Corymbia citriodora ssp. variegata* –spotted gum – Woondum provenance
* *Corymbia citriodora ssp. citriodora –* Lemon Scented spotted gum Hugenden provenance
* *E. tetradonta* – Darwin stringybark – seed purchased through Nindethana seed suppliers however there was no germination of these species
* *E*. longistrata – Grey Gum
* *E*. *raveretiana* – Black ironbox - local species in O’Connell sub-catchment –plants being supplied by Whitsunday Catchment Landcare

For more info Contact Reef Catchments