



- SOIL HEALTH IN BLUE GUM REVERSION - - THE SILVER LINING -

LOCATION: Bremer Bay

RAINFALL: 500 mm

SOIL TYPE: Sandy Duplex

PLANTATION TYPE: Tasmanian blue gum (*Eucalyptus globulus*)

PLANTATION AGE: 15 years blue gum

SIZE: 1000 hectares

FARMING ENTERPRISE: primarily grazing

COST OF REVERSION: approximately \$250/ha

NUTS & BOLTS:

- Many blue gum plantations in low rainfall, less productive parts of the south coast region will be converted back to traditional farming practices.
- Good opportunity for farmers add to their existing farm
- Opportunity to develop a 'whole farm plan'.
- Through actively managing ground cover, soil acidity and fertiliser regimes, once reverted the land is capable of growing productive crops and pasture.
- Based on results of this trial, blue gum plantations have no lasting effects on soil health

The South Coast NRM region of Western Australia covers a land area of more than 8.6 million hectares with agricultural landscapes making up nearly 70%. One key industry that developed in the region 20 years ago was the blue gum industry – growing hardwood fibre for woodchip export. This has contributed strongly to the economic and social fabric of the region with the Albany port exporting

its largest quantity of blue gum wood chips in 2014 (Southern Port Authority Annual Report, 2015). While the higher rainfall, more productive parts of the region will continue to support blue gum plantations, most of the blue gum plantations in the low rainfall, less productive areas will be converted back to traditional farming practices with or without the trees being harvested and sold.

AN OPPORTUNITY TO WHOLE FARM PLAN ●●●

Opportunistic farmers have taken advantage of this situation to obtain potentially 'cheap' plantation farms. These farmers are in a unique position to develop a whole farm plan to focus their investment effectively on the most productive parts of the farm whilst minimising costs associated with reversion of less productive areas.

The process of reverting plantations into productive agricultural land presents many practical, environmental and economic challenges. The reversion process poses significant environmental risks leaving land particularly susceptible to land degradation issues such as soil erosion and loss of soil structure, salinity and waterlogging. South Coast NRM in partnership with the University of Western Australia have been investigating the process of reverting plantation farms and the impacts on soil health. This case study includes a snap shot of one reversion technique and the soil health results.

CASE STUDY ●●●

A south coast farming family purchased a 1000 hectare blue gum farm in 2014, covered in more than 800 hectares of blue gums with the aim of reverting it back into grazing land.

"We are graziers at heart so the objective is to get cattle and sheep running on the farm as quickly as possible" said the farmer.

Due to the haulage distance from the port, the timber had no commercial value therefore the farmers decided to remove the trees. "It seemed a waste of a resource but there was no market and no prospect of any", said the farmer.

"It was a challenging task to clear hundreds of hectares of trees as well as running a farm and it has certainly had its challenges.

However it was a good opportunity to buy a cheap farm and develop it into something that worked for the farming business."



BLUE GUM REVERSION SNAPSHOT

- Chained down blue gum trees using two D7 dozers.
- Pushed trees into 2 km windrows using loader. Pushed up immediately because:
 - blue gums can reshoot if roots don't snap off completely;
 - allows grazing immediately between rows - contributing to income.
- Trash needs to be left at least 12 months before burning. Careful of smoke taint on other crops on neighbouring properties.
- Pasture species germinated from existing seed bank further reducing costs.
- The process took two years to revert to a productive farm.
- Initially grazed 60 breeding cows between the trees, a year later 180 breeders and by year two, the farm was at full capacity with 350-400 breeders.
- Cost of reversion was approximately \$250/hectare.

WHAT ARE THE BENEFITS?

- Good opportunity to purchase 'cheap' farm land.
- Secure farming for the next generation.
- Blank canvas, can design farm to maximise efficiencies and soil types.
- Chaining results in virtually no stumps to deal with.

WHAT ARE THE POTENTIAL ISSUES?

- Cost to bring farm back into a working profitable farm.
- No maintenance done, no fences, dams need cleaning out.
- Lots of work.
- Chaining can bring up clay on tree roots which is challenging to deal with.
- Potential for lack of income in first year.
- Risk of soil erosion.
- Excess debris from blue gums can cause issues for seeding equipment

BLUE GUM REVERSION AND SOIL HEALTH ●●●

Our aim: Do blue gum plantations negatively affect soil health?

What we did:

Soils were measured at 10 cm increments from 0-30 cm for changes in total soil carbon, macro nutrients and soil biology.

The trial compared soil properties under three different systems within the same farm:

- an existing blue gum plantation (15 years old),
- annual pasture site which had been converted from blue gum plantation (15 years old) two years previously, and
- an annual pasture site.

What we found:

- no statistical differences in soil pH between sites
- soil carbon in the top 10 cm was significantly higher in the annual pasture site
- nitrogen levels were higher in the annual pasture site compared to blue gum site
- bacterial communities were significantly different between sites. The annual pasture site had significantly higher relative abundance of Actinobacteria which may be associated with soil carbon content. The 'annual pasture site converted from blue gum plantation' had higher bacterial diversity than the 'existing blue gum' site which may be associated with a change of land use.

CONCLUSION ●●●

In this trial initial results indicate that blue gum plantations don't have a lasting impact on soil health. The management of the reversion technique used plays a large part in soil health post blue gum plantation. Through farmer's actively managing ground cover, marginal areas, soil acidity and fertiliser regimes, the land is capable of growing productive crops and pasture.

Making smart decisions from the onset of the reversion process will ensure farmers can retain the health of the land and the quality of water resources, whilst the health of their bank balance is not compromised into the future.

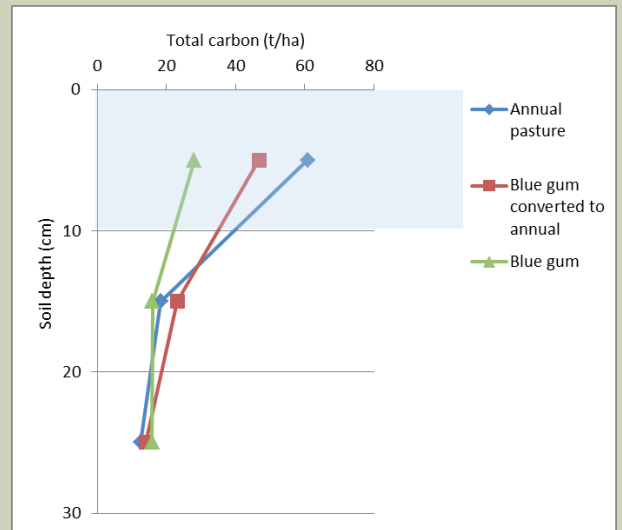


Figure 1. Total carbon (t/ha) in annual pasture, 15 year plantation converted to annual pasture and 15 year blue gum plantation

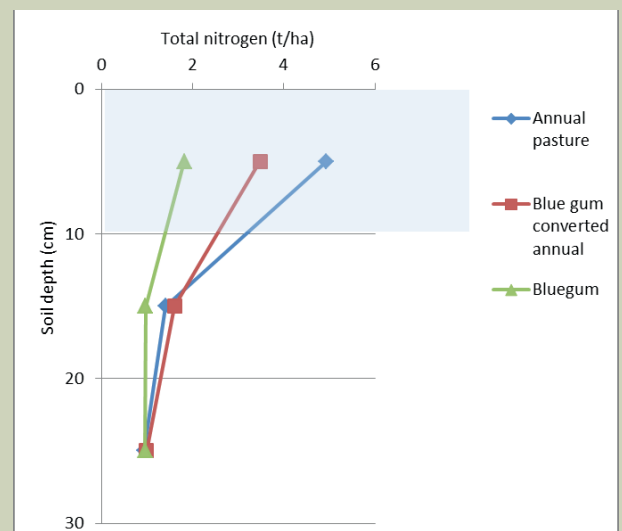


Figure 2. Total nitrogen (t/ha) in annual pasture, 15 year plantation converted to annual pasture and 15 year blue gum plantation



"If you put a lot into something it's more rewarding."



CONTACTS

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W: www.agtrialsites.com

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REFERENCE

Southern Port Authority Annual Report, 2015

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