SOIL WEALTH DARWIN PROJECT

Introduction

The Soil Wealth initiative provides growers with best practice information via a network of demonstration sites and social media. Practices focus on building soil health, improving productivity and profitability. Under the NT Regional Landcare Facilitator project, Territory Natural Resource Management has formed new relationships with stakeholders within the horticulture industry operating across Australia.

Background & Motivation

The demonstration site was set up to showcase a number of organic approaches that are now considered to be best practice for the broader horticulture industry. Through ongoing engagement processes, growers have expressed a need for programs that address a range of issues including retaining carbon in the soil, the role of microbiology in soil function and soil borne disease, and managing pests and disease in an integrated manner.

Project Focus

The demonstration site focuses on three key activities:

- The benefits of different types of cover cropping
- The effects of row covers on pest management and crop health
- The use of biochar to address soil carbon deficiencies and water holding capacity

MAIN AREAS OF CONCERN

- Very sandy soils at the site have high leaching and low carbon and cation exchange capacity
- Low carbon and water holding capacity impacts on healthy biological populations
- Root development seems to be restricted to shallow regions relative to moisture and nutrients

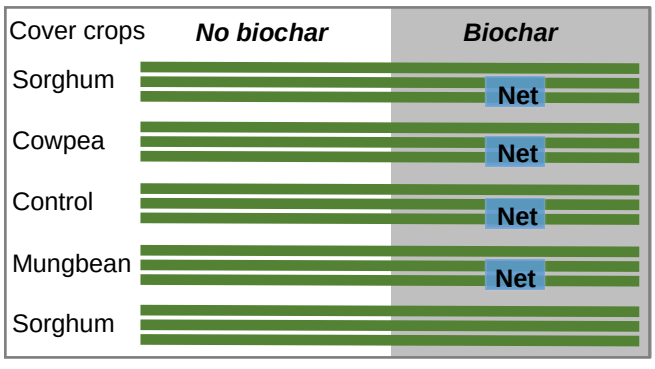
The Darwin Soil Wealth site consists of five beds (100m x 5m) with each bed made up of three rows. Cowpea, mungbean and sorghum cover crops were planted in December 2015 to protect the soils from heavy rains and to suppress weeds. One Control bed was left unsown. Once cut and incorporated into the

Biomass estimates were calculated for each cover crop by cutting and weighing a 1m^2 section. The fresh weights were recorded and multiplied by the area of each bed (100 x 5 m) to give biomass weights.

COVERCROP BIOMASS

Sorghum: 3000 kgs / 500 m^2
Cowpea: 1750 kgs / 500 m^2
Mungbean: 1000 kgs / 500 m^2

After the cover crops were incorporated a compost tea and molasses treatment was applied and biochar was added to half of the site at five tonnes/ha. With drip tape running along the rows, grey plastic mulch was used to cover each row and eggplant seedlings were planted approximately 60cm apart. Floating row covers (10 x 6 m) were placed over four of the sections.



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Soil tests were undertaken in the Control bed prior to the cover crops being incorporated. Further soil tests will be taken later in the season and at the end of the season to look at the benefits of different types of cover cropping and the application of biochar.

Discussion

MAIN BENEFITS AIMED FOR

- Reduced irrigation requirements
- Improved nutrient retention
- Increased beneficial soil biology
- Improved nutrient cycling

Cover cropping was used to provide several benefits. In addition to suppressing weeds and reducing soil loss from heavy wet season rains, it is anticipated that the cow pea and mungbean crops will boost the nitrogen content of the soil, whilst the sorghum with its greater bulk will contribute more carbon to the soil.

The plants under the floating row covers will be assessed for crop health and yield quality. They will then be compared to the uncovered crop. It will be interesting to see the effects of the floating row covers on the plants. Beneficial insects play an important role in an organic system. Their exclusion may actually be detrimental to plant health and yield.

The application of biochar to the soil will hopefully address key issues of extreme soil carbon deficiencies present in Top End horticulture systems as well as provide a full range soil function benefits including improved water holding capacity and nutrient availability.

"It was great to see the site and we certainly learned a lot about horticulture in the NT. It almost feels like a different country, there are so many differences between here and our southern sites."

Dr Jenny Ekman (AHR)

Future Activities

Yield assessments will be undertaken across the different trial scenarios later in the season. Fruit from plants in each trial will be counted, weighed and graded as marketable or unmarketable.

A Facebook page has been established by the NT Regional Landcare Facilitator and will be promoted throughout the local industry as a means for growers to connect regularly with the progress of these practices. In addition, a series of farm walks will be hosted at the site so growers can view the practices in action and connect with key industry experts.

Acknowledgements

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FURTHER INFORMATION

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