

SRA Capacity Building Project Final Report



Sugar Research
Australia

Research Funding Unit

Cover page

SRA project number:	MSF007
SRA project title:	Boosting productivity in Maryborough by assisting cane growers to understand their soils
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Acknowledgement of SRA funding:	The project participant/s wish to acknowledge receipt of project funding from the Australian sugarcane industry as provided by Sugar Research Australia Limited.



Summary

Project Objectives

This project was based around producing a soil map of the Bauple area which is south of Maryborough. The soil map will be a valuable tool for improving productivity in the area because it can facilitate better farm management, for example variety selection by soil type and more specific management of different soils. We used this mapping project as an extension tool to teach growers about their soils and how to better manage them, this resulted in four main extension activities:

1. Assisting growers in the Bauple area to identify their major soils types and to understand the key properties of their soils (surface and subsoil). Encouraging growers to assist in and observe soil mapping work.
2. Identifying the various subsoil constraints present across the Bauple area and assisting growers by providing management solutions to these constraints where present.
3. Conducting soil field days for growers within the Bauple area and wider cane growing district sharing the importance of understanding their soil properties and how it relates to improved productivity and catchment outcomes.
4. Using the resultant soil mapping data to provide growers with cane variety by soil type recommendation maps. Presently, growers in the Bauple area cannot access any other tool/s to assist them with soils x cane variety information.

Overview of key achievements and knowledge gained

A high quality map (Figure 1.) of the area was produced by the staff from Queensland Department of Natural Resources and Mines, the team collected and described 120 soil cores that resulted in 20 soil types identified including 14 that are new to the area. Bauple growers were very interested in the mapping project and readily gave permission to the team to access their land. They also observed the soil coring process and used their knowledge of their farms to confirm or adjust soil type boundaries.

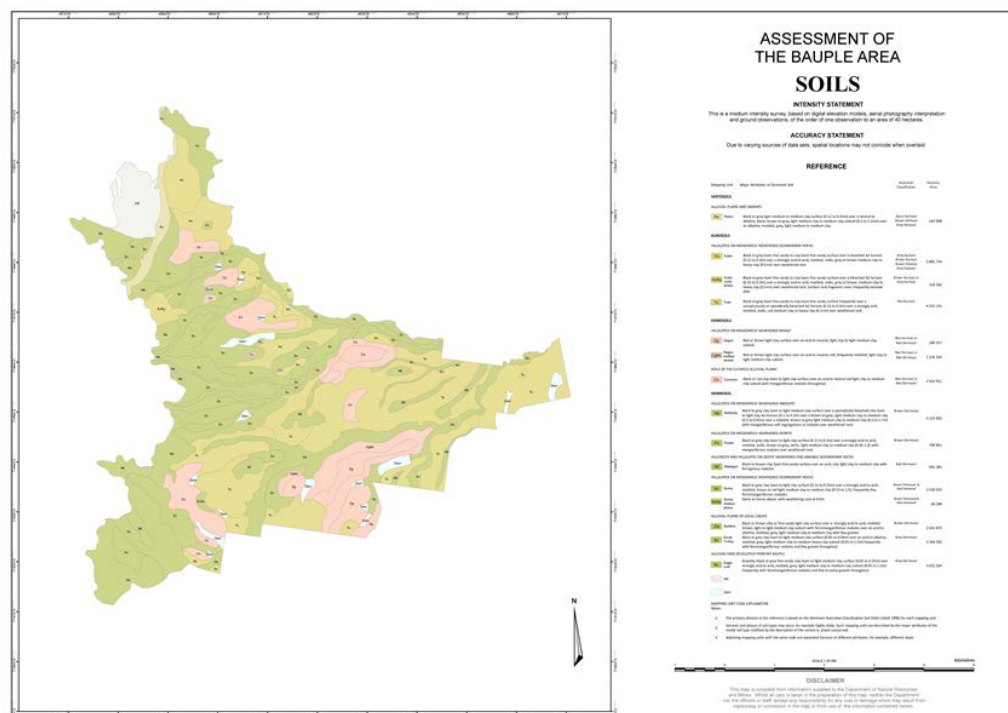


Figure 1. Soil map of the Bauple area

A major outcome of the project was the elucidation that the top soil and subsoil in most blocks was too acid for optimal crop growth. In some blocks the sub soil pH was below 5, in these blocks acidity is a major sub soil constraint. This observation was highlighted to the growers at field days. We will explore some solutions to the soil acidity issue with growers over the coming months.

We held two field days, one at Bauple and one at Maryborough. In Bauple we inspected three soil pits on three different soil types (Figure 2.). At each site we explained how the soil was formed, how productivity could be improved and how the soil could be managed in a sustainable manner.



Figure.2. *Mark Sugars talking to farmers at the field day in Bauple*

At the Maryborough field day we inspected two soil pits one the same soil type; one on land that had been used to grow sugarcane for many years and one on adjacent land that was undisturbed. We discussed the changes to the soil that had occurred as a result of sugarcane production and how soil health in the farmed area could be improved.

The soil maps will be used to determine variety performance by soil type. Each of the 20 soils identified in the Bauple area will be categorised into one of nine soil categories that are used for extension purposes in Maryborough. We will then add the Bauple productivity data for each soil type to an existing database. The Bauple growers can then use the data to select the best variety for their respective soil types. An example of the type of data we produce with this process is shown in Figure.3.

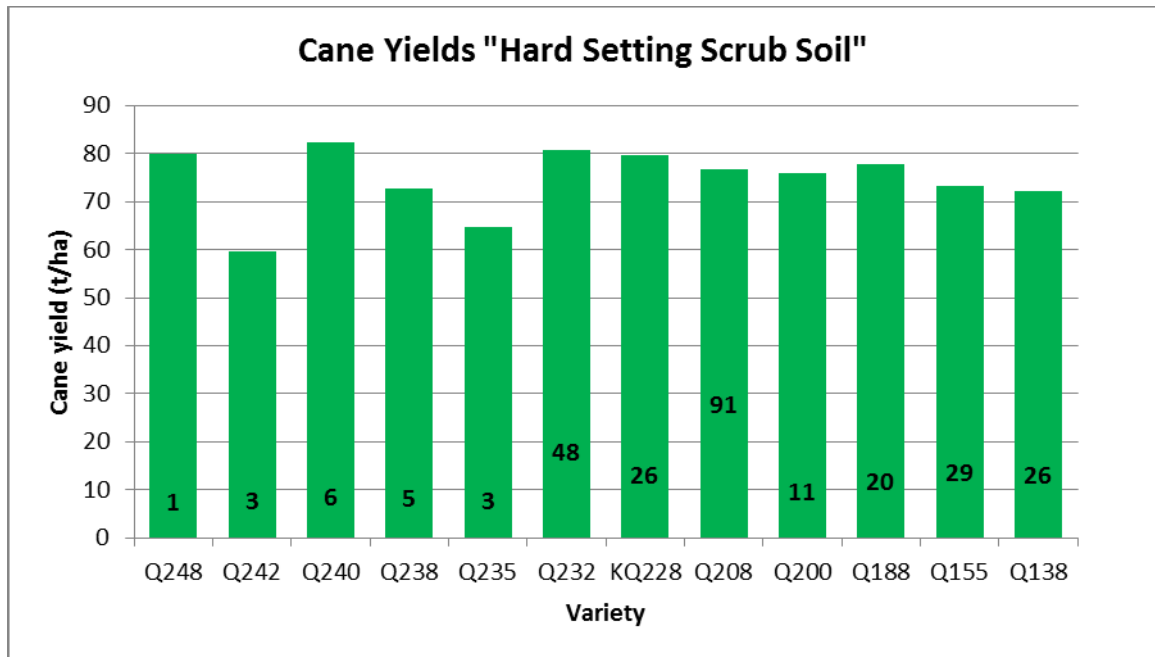


Figure.3. An example of the Variety by soil type performance data that is produced in Maryborough

Each grower was also presented with a personalised report on the soils found on their farm (Appendix 1). These were excellent reports that contained detailed descriptions of the soils on their farm.

Implications and recommendations resulting from the project

The biggest implication from the project was an increased awareness of the soil acidity issue in Bauple. Adjustment of the soil pH is highly likely to lead to increased productivity in the Bauple area. It is likely that this issue occurs in other areas besides Bauple, we recommend that there should be an increase in awareness of soil acidity issues in other cane farming areas.

We believe that the concept of combining a soil mapping project with an extension exercise is a very successful tactic to teach farmers about their soils. The farmers were aware of the subtle changes in soil type across their farm, this awareness manifested as genuine enthusiasm for the soil mapping process and the knowledge accumulated during the mapping process. If the opportunity arises again we would recommend and support this type of project.

Soil mapping and description looks deeper into the soil profile than the standard soil testing performed on cane farms. This has assisted the growers develop a greater awareness of the sub soil and the opportunities to improve sub soil for greater productivity. The industry at large should place a greater emphasis on sub soils.

Industry benefit or relevance

Economic

If our efforts to ameliorate the acid top soils and sub soils in Bauple are successful there will almost certainly be an increase in productivity. This will lead to an economic benefit in the Bauple and Maryborough area. There will also be an increase in productivity when there is better variety selection according to soil type, this will also lead to an

economic benefit and better use of the genetic assets produced by the Sugar Research Australia breeding program.

Environmental

Throughout the project we explained how soil type influences the management required for sustainable management. We hope that this will influence the management practices of the growers and lead to better preservation of the soil asset.

Social

The Bauple growers have often stated that they feel omitted from the Maryborough Cane Productivity Services extension effort due to their geographical location. They were certainly omitted from the Department of Natural Resources soil mapping project in the late 90s with all the cane area to the north, south, east and west of Bauple mapped. This project, undertaken especially for Bauple growers has demonstrated that they are important to the Maryborough industry and the wider industry.

The project also revealed that an ancient large drainage system, probably the Mary River used to flow on the eastern side of Mt Bauple (it now flows on the western side) and deposited alluvial soils in the area. This historical knowledge is good for an area.

Further dissemination and recommendations

Articles about the project were published in the Maryborough Cane Productivity Services newsletter *The Billet* (Appendix 2). We intend to publish an article about the project in the Canegrower magazine. We also intend to hold further field walks in Bauple when we start to ameliorate the acid soils.

The effort and professionalism displayed by Mark Sugars and Angela Estbergs from the Department of Natural Resources and Mines was exceptional and greatly appreciated by the farmers. We thoroughly recommend their involvement on other Sugar Research Australia projects.

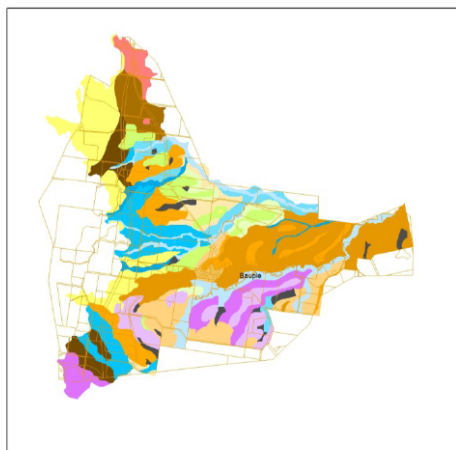
This project was a very good investment by Sugar Research Australia that will undoubtedly give a good return on investment. More novel methods to extend soil health knowledge should be considered.

Bauple soil mapping complete!

Thanks to some very hard work by Mark Sugars, Angela Estbergs and others from the Department of Natural Resource and Mines (DNRM) the soil map of Bauple is complete. In this Sugar Research Australia funded project Mark's team described an incredible 120 soil cores across the Bauple district over 15 days. They identified 20 different soil types including 14 that are new to the Maryborough District.

We will be able to use this map and the associated soil descriptions on a range of projects that will lead to improved productivity, such as identifying soil productivity constraints and determining variety performance by soil type.

As part of the project we will also be holding two soil pit days. These are field days where we can learn a lot about our soils by looking at a cross section. One will be at Bauple on the 27th November starting at Gees and the other in Maryborough on the 28th November. Mark has some interesting information for us including some evidence showing that the Mary River (or some other massive drainage system) once flowed on the eastern side of Mt Bauple. Be sure to come to one of these informative mornings and keep a look out for the flyer.



The Bauple Soil Map

December 2013

Opportunities resulting from soil pit days

Two soil pit days were held in November, one in Bauple and one at the MSF Sestak farm in Bidwill.



A soil pit at Bauple

These were excellent days where we were lucky enough to draw on the expertise of Angela Estbergs and Mark Sugars from the Department of Natural Resource and Mines. Over the last year these two soil scientists have had a detailed look at the soils in the Bauple and Maryborough areas and have come up with two key messages that could improve the productivity of our soils:

1. Many of our soils are too acid especially below 10-15cm, the depth where we normally sample at. This is could be limiting productivity on many blocks.
2. Many of our soils have sub soil constraints that restrict root growth and consequently limit the volume of soil that our crops can extract moisture from.

We are currently investigating ways that we may fix these issues and we also encourage growers to take soil samples from deeper in the profile. We need to know what the issues are before we can fix them.

We would also thank MSF and the other growers who generously helped us by digging pits for the field days.