

The Australian Cotton Soil Database: a simple database assistant for managing soil information

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Abstract

The Australian Cotton Cooperative Research Centre in association with the Cotton Research and Development Cooperation have funded a number of soil inventory projects which have produced enormous amount of soil data. The data have been incorporated into a queryable database using the Microsoft Access. Customised operations built into a Database Assistant enable variable queries to answer various soil quality questions that may be asked by researchers, farm managers, consultants and farmers, in retrieving appropriate soil data and information for a specific region/area and purpose. The soil data are geo-referenced and therefore are amenable to further Geographical Information System analysis.

Introduction

The various soil inventory projects funded by the Australian Cooperative Research Centre and the Cotton Research Development Cooperation have produced huge amount of soil data. The projects aimed to update soil database for cotton areas to be used for management decisions and improved farming practices. The database can also be used to derive useful information for the wider catchment modelling and planning. The Australian Cotton Soil Database is the result of the accumulated soil data built into one retrievable data catalogue in a customized database assistant for the stakeholders and cotton industry. The soil database provides consistent information where only fragmented data existed before. The soil information will enable land use planning easier and, help researchers, agronomists and landholders keep track of possible environmental problems.

The database initially covers the three main valleys where cotton is produced: The Macintyre, Gwydir and the Lower Namoi (Figure 1). Data obtained for the Upper Namoi, Macquarie, Bourke District and St George in Queensland, will be incorporated into the system soon.

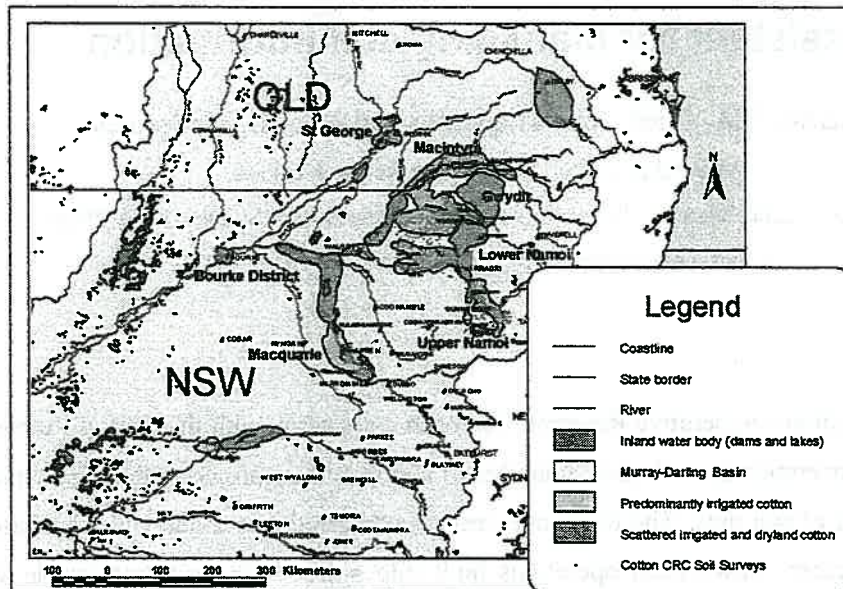


Figure 1. The Australian Cotton Soil Information System: the soil inventory regions

The Soil Database Assistant

The Australian Cotton CRC Soil Database Assistant (hereunder referred to as ACCRC-SDA) is a customised database management system developed based on the Microsoft Access application software (Figure 2).

Database Design

The ACCRC-SDA includes the following data types:

- *Farmer/Property Details.* Data points (sites) are grouped by the farms/property where they are situated. This is non-mandatory. **Details regarding farmers' contact information are only published with the farmers' permission.**
- *Site Coding.* Data points (sites) are coded by a unique key, date-stamp and grid reference.
- *Custom Soil Properties.* The soil properties at any site are completely customizable. Data are either in numeric date, string or lookup-list format and data integrity are enforced (e.g. cannot type a string in a numeric field). All sites have all soil properties recorded. Missing data are allowed.

- *Time series analysis.* Meets requirements for date-stamps on data points and future time-series analyses.
- *Soil Property Details.* All soil properties, including colour notations, are included.
- *GIS Integration.* Integration with geographical information system (GIS) is the ultimate aim of the database.
- *Network Integration.* The ACCRC-SDA is network enable.

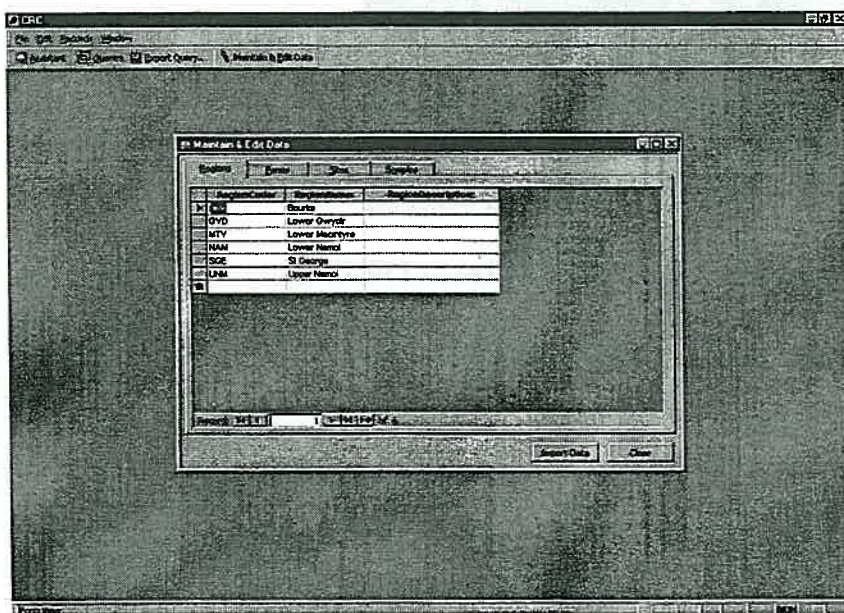


Figure 3. Data import interface

Conclusions

The ACCRC-SDA was developed as a simple database management system, incorporating all soil data from the CRC-CRDC funded projects. The Database Assistant has the following capabilities:

- View, query (based on selected criteria) the database and export a subset or more to a common format (e.g. ASCII);
- Maintain and edit the database under administrative privilege;
- Configure the database to suit a predetermined criteria;
- Customised entries and lookup fields in the database.

The ACCRC-SDA is an adjunct to the Australian Cotton CRC Soil Information System, which will be published soon.