

**BUREAU OF SUGAR EXPERIMENT STATIONS
QUEENSLAND, AUSTRALIA**

**FINAL REPORT – SRDC PROJECT BSS248
FACILITATE THE ACCESSIBILITY OF PRODUCTIVITY
DATA BY SUGARCANE FARM MANAGERS THROUGH THE
SUGARSCAPE PRODUCTIVITY SOFTWARE APPLICATION**

by

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SD01009

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ABSTRACT

Utilising previous research outcomes, a utility was added to the SUGARSCAPE software application to export productivity data and farm map data to common file types. The purpose of this export utility was to provide a method of importing seasonal data into the CANEMAN® block recording software application.

The export utility integrates the SUGARSCAPE productivity software and the CANEMAN farm block recording software. Cane farm managers are now able to import their seasonal productivity data in one simple step. Not only does this utility decrease the amount of time required to update their CANEMAN records; the data imported will have far greater accuracy than manually imported data. The export procedure also provides access to a farm map, if map data are available for that farm.

All project objectives were met. Recommendations for further research involve investing time in the ongoing maintenance of the software application to keep up with the dynamic environment of data collection and dissemination within the sugar industry.

SUMMARY

Each step in the sugar production process involves the collection of data. When cane is cut and carted to a siding data are recorded; when cane arrives at the mill data are recorded; when cane is processed into sugar data are recorded; when a grower is remunerated data are recorded. Most of this data entry is performed manually and each manual entry increases the margin for human error.

In the not so distant future, most of the data will be recorded automatically with the assistance of global positioning systems and other digital technologies. This will assist in recording accurate farm data. With diminishing profit margins on an ever increasing cycle, farmers need to be able to make use of their block data to assist with management decisions which may affect future seasons. To make these decisions they need to be able to access accurate block data, add to this their block treatments, and produce reports to reflect the profitability levels of their farm. The CANEMAN application currently provides a tool to collate this information and produce a variety of reports. However, the software currently has no utility for importing block data directly from another application or file. As the data have already been through a number of manual entry points and exist in electronic form, it would be advantageous for growers to access the data and import it into CANEMAN.

SUGARSCAPE was the major outcome of BS182S and was completed in December 2000. With minimal expense and effort, an export utility could be written into this application facilitating data export to CANEMAN. This would encourage the use of block recording software by growers, because block data could easily be imported.

The provision for software integration has not been done before in this area. Developers of both CANEMAN and SUGARSCAPE would be required to write the procedural coding required to query and format data to a standard file format ready for importing into CANEMAN. Saltbush, the creators of CANEMAN, would develop the utility to accept a standard file type and format for importing into CANEMAN.

On completion of this project, cane farmers will be able to access their block productivity data in a standard file format and use it to enhance their block records. The industry will benefit as more cane farmers utilise block-recording programs and hence produce better farm records.

1.0 BACKGROUND

For the average cane farmer the manual entry of his/her productivity data into the CANEMAN block recording application is a time consuming task. What makes this task seem more cumbersome is the knowledge that the productivity data already exist electronically at the grower's sugar mill. This duplication of effort increases the margin of errors introduced into the grower's productivity data records and therefore reduces the integrity of the reports being produced by the software. If growers could receive their data unaltered in one file the validity of their block records would be far more accurate.

The SUGARSCAPE productivity software application will be the major outcome of SRDC project BS182 'An Integrated Decision Support System (DSS) to improve the utilisation of productivity data by extension, research and productivity programs'. SUGARSCAPE will provide a standard productivity-reporting tool for industry extension, research and productivity staff. Reports are presented either graphically, tabled or spatially. The application will also provide a number of utilities, one of these being a farm export option. Currently, the outputs of this option can not be imported into the CANEMAN application; however, this could be achieved with relative ease.

The automation of importing block productivity records would increase the popularity of the CANEMAN software to cane farmers across the industry. Also, if spatial data are available cane farmers could access their spatial data, enabling the production of a simple map of their farm.

The lack of standard data formats is a major problem that impedes the collaboration of software and hardware resources in the Australian sugar industry. The use of applications such as SUGARSCAPE and CANEMAN may provide an evolutionary step towards one standard data model for the recording of cane productivity data in electronic or digital form. Standardisation would enable industry-wide benchmarking and this would promote a more profitable and sustainable sugar industry for the future.

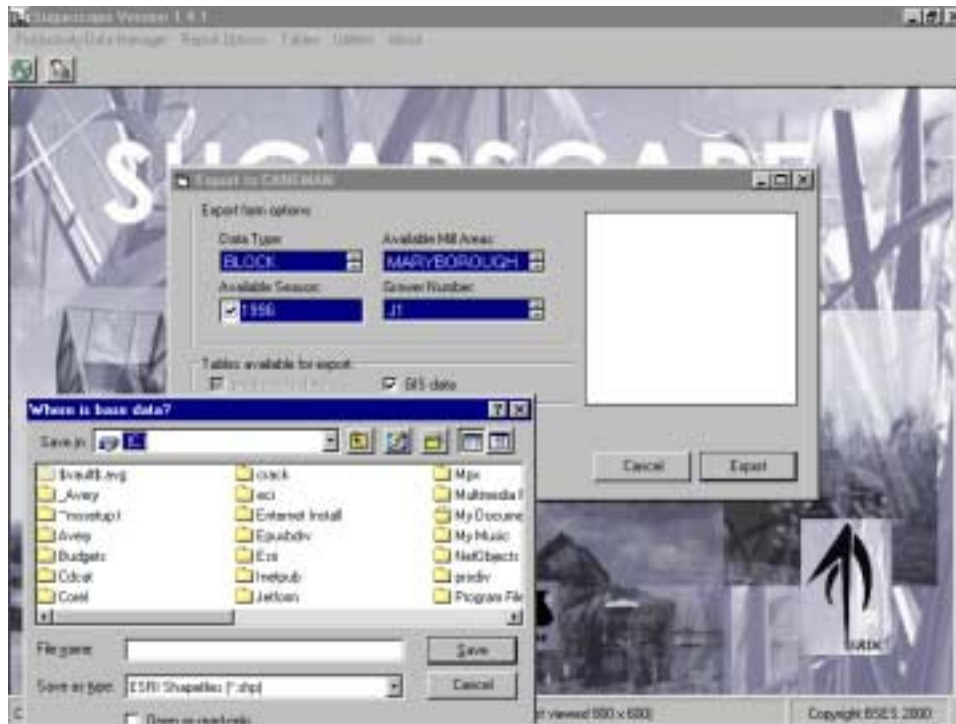
2.0 ACHIEVEMENT OF PROJECT OBJECTIVES

- *Extend the SUGARSCAPE productivity software application by developing a utility to export the productivity and spatial data of an individual sugarcane grower to a file that can be imported into the CANEMAN software application.*

To achieve the above objective, a new export utility was added to the SUGARSCAPE application to provide users with a tool for downloading block productivity data and map data to a common file type. Users are required to select the season/s, mill area, and farm or grower number they wish to export. By selecting the appropriate option, users may also export farm map data if these are available for their area. On completion of the export process, the users will have access to a delimited text file that consists of each block record for their farm for a selected season/s. If the mapped data have also

been exported, users will have access to a collection of files, which may be opened in a GIS compatible software application such as ArcView, ArcExplorer or MapInfo.

The importation of data into CANEMAN is covered by the next objective.



Screen Dump 1: Exporting data from SUGARSCAPE

Steps for exporting file are included in the software user guide.

- *Extend the CANEMAN software application to include an import utility that will allow users to import their entire seasonal records and spatial data in one procedure.*

This objective was achieved. Saltbush software, the creators of CANEMAN, has created an import utility that accepts the data exported from the SUGARSCAPE application

- *Increase the validity of block recording data for the individual cane farm manager whilst decreasing time allocated to data input each season by an individual farmer.*

The integration of the SUGARSCAPE and CANEMAN applications removes need for manual input of data therefore decreasing human error. Previously, farmers were required to enter each block record from their cane payment documentation received from the sugar mills. Even the avid computer user makes the odd typing error and therefore decreases the integrity of the data. Depending on the skill of the user, it is

estimated that the average CANEMAN user spends approximately 2-4 hrs to input block records from the cane pay report during a season. Not only will an automatic import procedure increase the integrity of data reports produced through the CANEMAN software application, but an entire season's records can be imported in a matter of seconds. This increases the incentive for farmers to keep better records for their cane farm.

- *Promote the standardisation of productivity data profiles throughout the Australian sugar industry to facilitate benchmarking across mill areas.*

The SUGARSCAPE application was designed for use across all mill areas throughout Queensland and New South Wales. As the software application increases in popularity, the data structure required for data to be loaded into the application will become known throughout the industry, as well as the selection of reports available for output. As the software application is now required to export productivity data for cane farmers, this will increase the demand for the software application to be available in each mill area, and perhaps form the basis of a new data standard.

- *Provide ongoing maintenance for the SUGARSCAPE application throughout the duration of the project.*

Throughout the duration of this project the SUGARSCAPE application has been supported fully. Several bugs were identified in the CCS report and the Farm versus Zone report. These were minor issues that were resolved as soon as they were identified.

3.0 METHODS

The duration of the project was six months. Early in the project, a meeting was held with Saltbush software to develop the specifications for the export utility. Following this meeting the pseudo code was developed for the export process and coding of the export procedure commenced. Several SUGARSCAPE data fields had to be modified to allow the integration of data with CANEMAN's data specifications.

After the code was completed, the data were tested using a fictional test. Appendix A contains a hard copy of the test data.

It is expected that Saltbush software will provide an add-on mapping component for an extra cost. To ensure their existing clients have access to the import procedure, the export procedure will allow users to export productivity data and GIS data as two separate files. Therefore existing CANEMAN users will receive the new version with the productivity import procedure. If users would like to make use of the mapping procedure they can then purchase the add-on.

The user and on-line documentation was modified to include the new export procedure. The user documentation also defines the revised data format required for loading new data into SUGARSCAPE.

4.0 DISCUSSION OF RESULTS

All expected outcomes have been achieved.

The SUGARSCAPE and CANEMAN applications are now integrated through their export and import procedures, respectively. The export procedure not only provides data for the CANEMAN application; the data may also be accessed by other common software applications.

Saltbush software, the developers of CANEMAN, has included an import procedure to accept the data files exported through SUGARSCAPE.

At the time of writing, the new versions of the software applications are not available to industry and farmers; therefore, it is difficult to analyse whether this application has increased the integrity of block data within the industry. The supervisor can only assume, based on experience that the less human intervention in the data import procedure the less likely data integrity errors will occur.

The standardisation of productivity data has a long way to go to being accepted as the norm. These software applications are developing data standards of their own type. Whether these data standards are accepted by the industry or not, they have at the very least reiterated the need for a common data standard for the sugar industry.

Bugs were fixed in the CCS chart and the Farm versus Zone reports; these were discovered during a training session held in New South Wales early in the project. The software application has been fully supported during the length of the project.

4.1 Assessment of the likely impact for the sugar industry in Australia and elsewhere and, where possible, the cost and potential benefit to the Australian sugar industry and future research needs

The major benefit of this project will be the provision of a tool to collate a cane farmer's seasonal data in one file for importing into the CANEMAN block recording program. If spatial data are available these could also be exported to file.

A grower can now request his/her block productivity data from their local extension officer and in one simple step import the data directly into CANEMAN, where it can be value added with irrigation, fertiliser applications, spraying and levelling operations, and other farm inputs.

The data recorded in CANEMAN could then be used as inputs for farm benchmarking software available to the industry.

5.0 PROJECT TECHNOLOGY

The SUGARSCAPE software application was developed to assist extension, research and productivity staff, and sugar mills within the Australian sugar industry. Therefore, no intellectual property issues arise.

5.1 Recommendations on the activities or other steps to further develop disseminate or exploit the project technology

- Integrate existing report options with pest, disease, rainfall and irrigation data.
- Actively seek ongoing funding to continue the development of the database application as the industry dictates. Provide ongoing maintenance as required to ensure the application remains useful for the industry.

APPENDIX A - Test Data

| MILL AREA | SEASON | SUB DISTRICT ID | GROWER ID | BLOCK ID | VARIETY | CROP CLASS | TONNES HARVESTED | TONNES BURNT | HECTARES HARVESTED | HARVEST DATE | CCS ACTUAL | CCS RELATIVE | FALLOW REPLANT INDICATOR | CANE AGE | SOIL TYPE |
|-----------|--------|-----------------|-----------|----------|---------|------------|------------------|--------------|--------------------|--------------|------------|--------------|--------------------------|----------|-----------|
| BABINDA | 1996 | 1 | 10 | 1-A | Q124 | FAL | 938.75 | 0 | 10.01 | 24/09/99 | 14719.6 | 14024.9 | F | 1 | |
| BABINDA | 1996 | 2 | 11 | 1-A | Q135 | AP | 1155.35 | 1155.35 | 7.46 | 22/09/99 | 15481.7 | 14592.1 | F | 1 | |
| BABINDA | 1996 | 3 | 12 | 1-A | Q117 | SP | 2264.66 | 2264.66 | 14.32 | 27/09/99 | 31931.7 | 30459.7 | F | 1 | |
| BABINDA | 1996 | 4 | 13 | 1-A | Q152 | 1R | 1774.49 | 1774.49 | 10.58 | 19/10/99 | 26457.6 | 25180 | R | 2 | |
| BABINDA | 1996 | 5 | 14 | 1-A | Q124 | 2R | 1059.13 | 1059.13 | 9.49 | 21/10/99 | 13631 | 14160.6 | R | 2 | |
| BABINDA | 1996 | 6 | 15 | 1-A | Q124 | 3R | 1077.08 | 1077.08 | 10.57 | 21/10/99 | 14594.4 | 14745.2 | R | 2 | |
| BABINDA | 1997 | 1 | 10 | 1-A | Q124 | PL | 938.75 | 0 | 10.01 | 24/09/99 | 14719.6 | 14024.9 | F | 1 | |
| BABINDA | 1997 | 2 | 11 | 1-A | Q135 | AP | 1155.35 | 1155.35 | 7.46 | 22/09/99 | 15481.7 | 14592.1 | F | 1 | |
| BABINDA | 1997 | 3 | 12 | 1-A | Q117 | SP | 2264.66 | 2264.66 | 14.32 | 27/09/99 | 31931.7 | 30459.7 | F | 1 | |
| BABINDA | 1997 | 4 | 13 | 1-A | Q152 | PS | 1774.49 | 1774.49 | 10.58 | 19/10/99 | 26457.6 | 25180 | R | 2 | |
| BABINDA | 1997 | 5 | 14 | 1-A | Q124 | S1 | 1059.13 | 1059.13 | 9.49 | 21/10/99 | 13631 | 14160.6 | R | 2 | |
| BABINDA | 1997 | 6 | 15 | 1-A | Q124 | 3R | 1077.08 | 1077.08 | 10.57 | 21/10/99 | 14594.4 | 14745.2 | R | 2 | |
| BABINDA | 1996 | 1 | 9 | 2-B | Q124 | RS | 1000 | 1000 | 10 | 21/10/99 | 14000 | 14700 | F | 1 | |
| BABINDA | 1997 | 1 | 9 | 3-B | Q152 | OR | 1000 | 1000 | 10 | 21/10/99 | 12000 | 12000 | F | 1 | |
| BABINDA | 1996 | 1 | 8 | 2-B | Q124 | SO | 1000 | 1000 | 10 | 21/10/99 | 14000 | 14700 | F | 1 | |
| BABINDA | 1997 | 1 | 8 | 3-B | Q152 | S/O | 1000 | 1000 | 10 | 21/10/99 | 12000 | 12000 | F | 1 | |
| BABINDA | 1996 | 1 | 10 | 1-A | Q124 | SF | 938.75 | 0 | 10.01 | 24/09/99 | 14719.6 | 14024.9 | F | 1 | |
| BABINDA | 1996 | 2 | 11 | 1-A | Q135 | RS | 1155.35 | 1155.35 | 7.46 | 22/09/99 | 15481.7 | 14592.1 | F | 1 | |
| BABINDA | 1996 | 3 | 12 | 1-A | Q117 | 4R | 2264.66 | 2264.66 | 14.32 | 27/09/99 | 31931.7 | 30459.7 | F | 1 | |
| BABINDA | 1996 | 4 | 13 | 1-A | Q152 | 5R | 1774.49 | 1774.49 | 10.58 | 19/10/99 | 26457.6 | 25180 | R | 2 | |
| BABINDA | 1996 | 5 | 14 | 1-A | Q124 | 6R | 1059.13 | 1059.13 | 9.49 | 21/10/99 | 13631 | 14160.6 | R | 2 | |
| BABINDA | 1996 | 6 | 15 | 1-A | Q124 | 7R | 1077.08 | 1077.08 | 10.57 | 21/10/99 | 14594.4 | 14745.2 | R | 2 | |
| BABINDA | 1997 | 1 | 10 | 1-A | Q124 | 8R | 938.75 | 0 | 10.01 | 24/09/99 | 14719.6 | 14024.9 | F | 1 | |
| BABINDA | 1997 | 2 | 11 | 1-A | Q135 | 9R | 1155.35 | 1155.35 | 7.46 | 22/09/99 | 15481.7 | 14592.1 | F | 1 | |
| BABINDA | 1997 | 3 | 12 | 1-A | Q117 | 10R | 2264.66 | 2264.66 | 14.32 | 27/09/99 | 31931.7 | 30459.7 | F | 1 | |
| BABINDA | 1997 | 4 | 13 | 1-A | Q152 | RS | 1774.49 | 1774.49 | 10.58 | 19/10/99 | 26457.6 | 25180 | R | 2 | |
| BABINDA | 1997 | 5 | 14 | 1-A | Q124 | S2 | 1059.13 | 1059.13 | 9.49 | 21/10/99 | 13631 | 14160.6 | R | 2 | |
| BABINDA | 1997 | 6 | 15 | 1-A | Q124 | S3 | 1077.08 | 1077.08 | 10.57 | 21/10/99 | 14594.4 | 14745.2 | R | 2 | |
| BABINDA | 1996 | 1 | 9 | 2-B | Q124 | S4 | 1000 | 1000 | 10 | 21/10/99 | 14000 | 14700 | F | 1 | |
| BABINDA | 1997 | 1 | 9 | 3-B | Q152 | S5 | 1000 | 1000 | 10 | 21/10/99 | 12000 | 12000 | F | 1 | |
| BABINDA | 1996 | 1 | 8 | 2-B | Q124 | S6 | 1000 | 1000 | 10 | 21/10/99 | 14000 | 14700 | F | 1 | |
| BABINDA | 1997 | 1 | 8 | 3-B | Q152 | S7 | 1000 | 1000 | 10 | 21/10/99 | 12000 | 12000 | F | 1 | |
| BABINDA | 1996 | 1 | 10 | 1-A | Q124 | S8 | 938.75 | 0 | 10.01 | 24/09/99 | 14719.6 | 14024.9 | F | 1 | |
| BABINDA | 1996 | 2 | 11 | 1-A | Q135 | S9 | 1155.35 | 1155.35 | 7.46 | 22/09/99 | 15481.7 | 14592.1 | F | 1 | |

