

POSTER SUMMARY

THE REVAMPED SASRI WEATHER DATA SERVICE

SINGELS A, HARDING R, SITHOLE P AND NTOMBELA L

South African Sugarcane Research Institute, P/Bag X02, Mount Edgecombe, 4300, South Africa
abraham.singels@sugar.org.za

Abstract

Weather plays a key role in determining sugarcane crop growth and water use. High quality weather data is essential for effective sugarcane research and production management. This poster reports on the revamping of the South African Sugarcane Research Institute (SASRI) weather data service.

A survey was conducted to determine user perceptions regarding current products and preferences for future products. This assisted in the design of improved data collection, transfer and processing procedures, in the development of new products and in repackaging existing products.

Currently, the SASRI weather station network consists of 41 automatic stations (AWS) and eight manual stations (MWS) that record daily rainfall, solar radiation or sunshine duration, temperature, wind speed and air humidity. Daily rainfall is also recorded at an additional 106 rainfall stations. AWSs are owned by various role-players and operated and maintained either by SASRI (25) or by the Agricultural Research Council Institute of Soil, Climate and Water (ARC-ISCW) (16). Data from AWSs are downloaded daily, while data from other stations are obtained monthly via post or email, or are uploaded through the new website. Data are automatically screened and corrected for inconsistencies and gaps, before they are stored in an Oracle database. Weather driven crop parameters such as reference evapotranspiration, soil water content and stalk growth rate are calculated and stored.

Products are now delivered mainly through a new website (Oracle Portal) directly from the database. Users can view or download maps, reports and data files in standard or user-specified formats. The poster describes these products in more detail and highlights the advantages of the new service.

Keywords: weather data, weather station, evapotranspiration, rainfall, website

Introduction

Weather plays a key role in determining sugarcane crop growth and water use. High quality weather data is essential for effective sugarcane research and production management. This poster briefly describes the revamping of the South African Sugarcane Research Institute (SASRI) weather data service.

The overall goal was to refine, consolidate and modernise the weather data service to the South African sugar industry (external and internal clients of SASRI). Specific objectives were:

- to develop new and reformat existing products according to user needs and utilising the latest technology available,
- to refine weather data collection, transfer, processing and dissemination procedures, and
- to recommend policies and procedures for the operation and expansion of the SASRI weather database and network.

Survey

A survey was conducted to determine user perceptions regarding current products (such as the web-based information system developed by Singels *et al.*, 1999) and to determine preferences for future products. This was in the form of a multiple-option, tick-box spreadsheet that was e-mailed to approximately 500 existing and potential users. These included sugarcane farmers selected from each production region in the industry, met site co-operators, SA Sugar Association and SA Cane Growers' Association staff, agricultural consultants, representatives of mill group boards, milling companies, and the transport sector. Thirty-five replies were received and statistically analysed. This assisted in the design of improved data collection, transfer and processing procedures, in the development of new products and in repackaging existing products.

Data collection, processing and storage

Currently, the SASRI weather station network consists of 41 automatic stations (AWS) and eight manual stations (MWS) that record daily rainfall, solar radiation or sunshine duration, temperature, wind speed and air humidity. Daily rainfall is also recorded at an additional 106 rainfall stations (RS). AWSs are owned by various role-players and operated and maintained by either SASRI (25) or the Agricultural Research Council Institute of Soil, Climate and Water (ARC-ISCW) (16). A data sharing agreement could not be reached with the South African Weather Services.

Data from AWSs are electronically downloaded daily, while data from other stations are obtained monthly via post or e-mail, or uploaded through the new website. Although downloads are currently conducted via GSM technology, the cheaper and the more efficient GPRS technology will in the near future be phased in.

Downloaded data are automatically screened and corrected for inconsistencies (tolerance limits and temporal and spatial consistency) and gaps, before they are stored in an Oracle database. Faulty and missing data are filled in with estimates derived from observations from neighbouring stations, other related weather variables or from long-term mean monthly values.

Weather driven crop parameters such as reference evapotranspiration, soil water content and stalk growth rate are calculated and stored.

Data presentation

Products are now delivered mainly through a new website (Oracle Portal) directly from the database. Users can view or download maps, reports, graphs (in pdf format) and data files in standard or user-specified formats. The site has a convenient navigation bar on the left of the browser screen that provides the different options to the user. Further options and content are displayed in the frame alongside the bar. Some of the products available are:

- Maps – Colour maps showing how the specified variable (e.g. rainfall or maximum temperature or reference evapotranspiration) averaged over the specified time period (e.g. daily, weekly, monthly or annually) varies with mill supply area or homogenous climate zone.
- Yesterday's rainfall report – Rainfall values for all stations for the previous day.
- Monthly industry rainfall reports – A summary of monthly rainfall for regions of the industry, with graphs of past rainfall following the conventional format used in, for example, the Sugar Journal rainfall report.
- Standard report – Industry report for the specified weather element (e.g. maximum temperature), specified month (e.g. July 2009) and specified average (daily, weekly or monthly) in the conventional format.
- Custom reports – Data for the specified combination of weather elements for a specified period for a specified weather station, homogenous climate zone or mill supply area. Downloads of data in a specified format for use in applications such as crop models and decision support systems are also available.
- Standard and custom graphs – A graphical display of the information above. Comparisons can also be made with long term mean monthly values. An example of graphical output is shown in Figure 1.

Conclusions

The main outcomes from the project were:

- A new weather data processing system that enhances the quality of weather data products used widely for research and management in the sugar industry,
- A new website application for delivery of custom and standard weather data products to industry users, and
- More efficient allocation of SASRI resources to operate the SASRI weather data service.

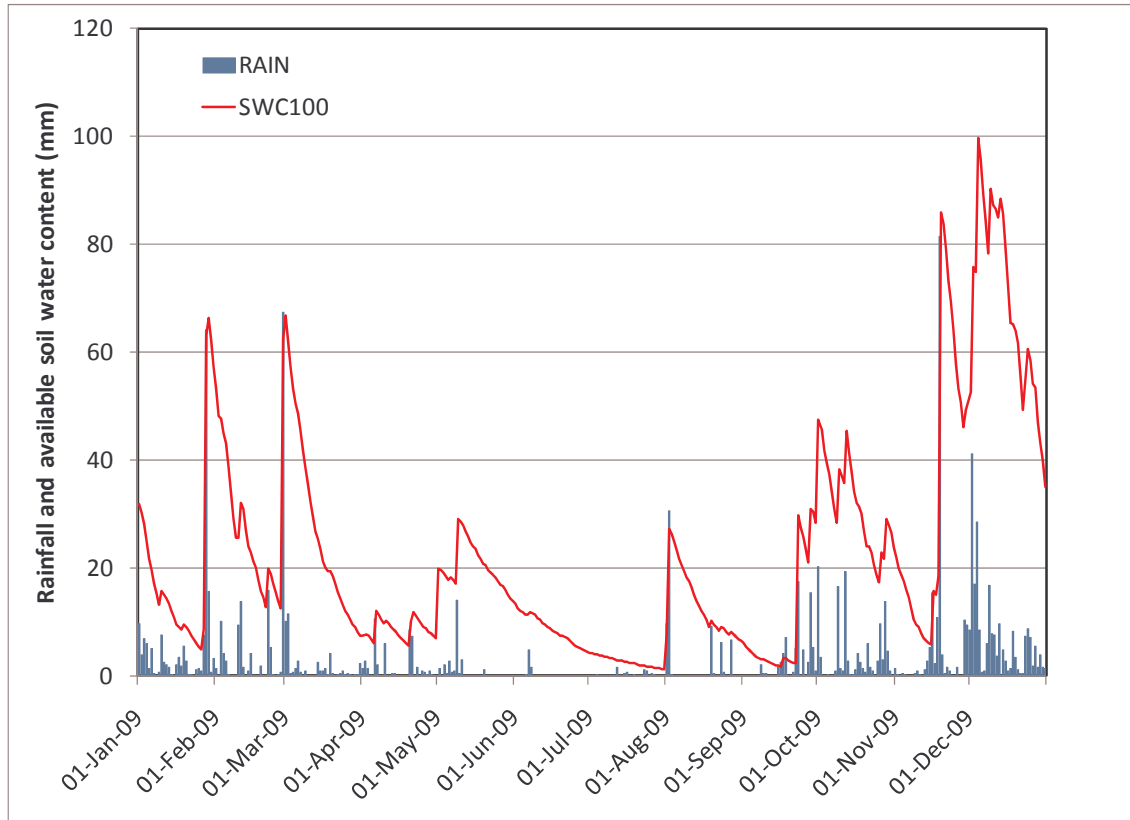


Figure 1. A graphic example of output generated from the new SASRI weather web. Daily values of rainfall (RAIN) and reference available soil water content for a soil with a available water holding capacity of 100 mm (SWC100) for 2009, averaged over the Maidstone mill supply area.

Acknowledgements

The SASRI weather service cannot operate without the enthusiastic and selfless contributions from SASRI staff Jarmans Chetty and Joe Govender, volunteer met site co-operators and AWS owners. The ARC-ISCW shares data from some AWS with SASRI. Saryx (www.saryx.co.za) develop the website.

REFERENCES

Singels A, Kennedy AJ and Bezuidenhout CN. (1999) Weather based decision support through the Internet for the agronomic management of sugarcane. *Proc S Afr Sug Technol Ass* 73: 30-32.