

SHORT, NON-REFEREED PAPER

TYPICAL FARM MODELS: A METHODOLOGY TO BENCHMARK SUGARCANE FARMS LOCALLY AND INTERNATIONALLY

NICHOLSON RJ¹, VAN DER WESTHUIZEN D² AND GOUSE M³

¹ Kwa-Shukela 170 Flanders Drive Mount Edgecombe,
sinothando.dube@sacanegrowers.co.za

² The Grain Building Agri-hub 411 Witherite Street Pretoria
divan.vanderwesthuizen@up.ac.za

³ The Grain Building Agri-hub 411 Witherite Street Pretoria
marnus.gouse@up.ac.za

Abstract

The South African Cane Growers' Association (SACGA) has since 2012 taken part in the *agri benchmark network* based at the Thünen Institute of Farm Economics in Germany through the South African network partner, the Bureau for Food and Agricultural Policy (BFAP). With the aim of strengthening the output of the Large-Scale Grower Cost Survey data, SACGA has researched and developed 'Typical Farm' models for the North Coast, South Coast, Midlands, Zululand and Mpumalanga regions. Due to this expansion of the South African sugarcane network of farms, SACGA has an industry wide set of models. The methodology employed is used to validate the current cost survey data results from what are called 'Typical Farms', which describes a typical farm as a modal farming enterprise under similar conditions with modal characteristics such as size, organisation and practices. Focus groups of growers provide opportunities for additional data collection but also validation of the data, farming or management systems employed in the different cane growing regions. This research methodology, although not new, provides the organisation and the industry with unique insights into the differences in direct farm costs between regions in South Africa. By being part of the global network, international comparisons can also be made. This short paper outlines the methodology used to develop the typical farms as well as providing some examples of how the data can be analysed for better decision making by farmers, SACGA and the industry at large.

Keywords: benchmark, network, typical farm, data, analysis, regions

Introduction

The South African Cane Growers' Association (SACGA) has been collecting and analysing grower costs since its inception in 1932/33. Grower cost data in the initial survey was captured from 1926/27. This collection of data has formed the backbone of the organisation over the past 90 years. The costs of growing sugarcane are collected, analysed and published to effectively represent growers at industry, government and other stakeholder levels. As was done in 1932/33, the costs of growing cane were used to determine the level of protection from imports the government needed to afford the industry; this is as important now as it was then.

The large-scale grower (LSG) cost survey has changed over time as farming processes and systems changed. Another issue has been the rates of response to the survey, with SACGA always having to put in significant effort with growers to submit their completed forms and other data required for the survey. Increasingly, as farming operations become more complicated, with diversification and changes to farm business enterprise structures, simply gathering costs from surveys and financial statements has become more difficult. SACGA therefore explored alternatives to strengthen the LSG cost survey data.

The proposed change in methodology would be to validate cost survey data results in the models called 'Typical Farms'. Elliot (1928) describes a typical farm as a modal farming enterprise under similar conditions with modal characteristics such as size, organisation and practices.

The use and advantages of using the typical farms methodology for farm management, extension work and agricultural policy has been described by many authors (e.g. Carter 1963; Day 1963; Plaxico and Tweeten 1963).

The organisation that has brought this methodology and analysis to the fore recently has been the *agri benchmark network* coordinated by the Thünen Institute of Farm Economics in Germany. To achieve a global network of typical farms in the major agricultural production sectors including sugarcane, the network developed an internationally harmonised Standard Operating Procedure (SOP) (Zimmer and Deblitz, 2005). These SOPs ensure that the methodology employed is transparent as to how typical farms are selected and described relative to the farm population and, in the long run, enables researchers to draw conclusions regarding the entire sector, based on farm level results (Krug, 2013).

Typical farm methodology and Discussion

The typical farm is defined as an existing farm, or data set describing a farm, in a specific region which represents a major share of output for the commodity under consideration, in this case sugarcane. The farm must be implementing the prevailing production system and reflect the prevailing combination of enterprises, land, labour and capital resources.

The model typical sugarcane farms are established by the researchers using the following steps:

1. The most important sugarcane production regions in each country are identified, taking into consideration their share of area under cane and, in the case of South Africa's small-scale growers, consolidating the area covered by growers in that region.
2. Determining the major farm features such as size, climate and yield, distribution of cultivated crops, management and location are derived from regional statistical data. This ensures that the typical farm reflects the important characteristics of farms producing most of the output in the region being studied (i.e. representative of the local area).
3. Once the selection and characteristics of the typical farm have been completed, the infield data collection takes place. This includes the validation of farm data and detailed sugarcane production systems with a panel of growers, extension officers or local experts. All major cost components for growing sugarcane (e.g. machinery, inputs, buildings, labour and cost of capital) are captured and validated by the panel (Balieiro *et al.*, 2016).

Focus groups of between 5-10 growers are used to gather not only additional data, but also for validation of the data and farming or management system employed in the area. This ensures that the model farm or typical farm analysis is as close to representing the actual production systems of the farm (and area) as possible. The models will be constructed in three phases, firstly the identification and construction phase uses pre-existing cost survey data and crop budgets (planting budget and ratoon management) to produce a pre-panel farm. The second phase, which is the most important from a real-life decision-making point of view, is the grower validation where the pre-panel data is validated by a panel of growers to ensure accuracy and representivity of the model farm. Finally, the model is finalised and submitted to the *agri benchmark network* in Germany for cross checks and final validation (Nicholson and Hurly, 2017).

Since 2012, SACGA, in collaboration with the Bureau for Food and Agricultural Policy (BFAP) at the University of Pretoria and the *agri benchmark network*, have undertaken the development of one typical farm based on the North Coast. Utilising the typical farm methodology more farms are currently being developed in the Midlands, on the South Coast, in Zululand, which is a small-scale farm model (KwaZulu-Natal), and on a Northern irrigated farm in Malelane (Mpumalanga). Figure 1 shows the typical operational cost analysis that can be achieved on an international basis (Balieiro et al, 2016).

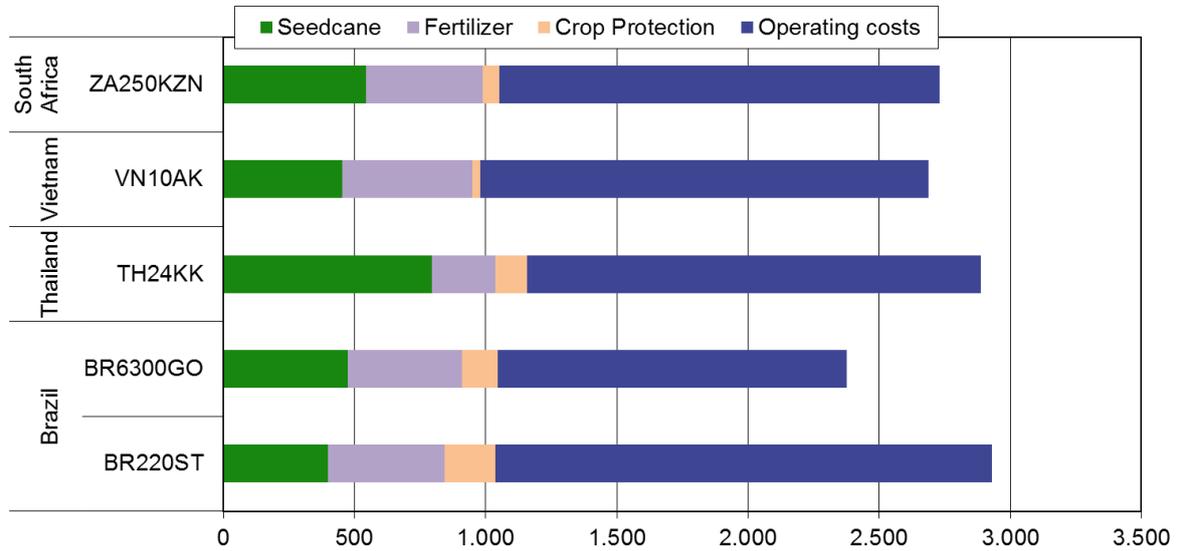


Figure 1. Farm input cost analysis for typical farms in South Africa, Vietnam, Thailand and Brazil (Balieiro et al., 2016).

Figure 2 is another illustration of the valuable data that can be extracted and compared to other typical farms internationally.

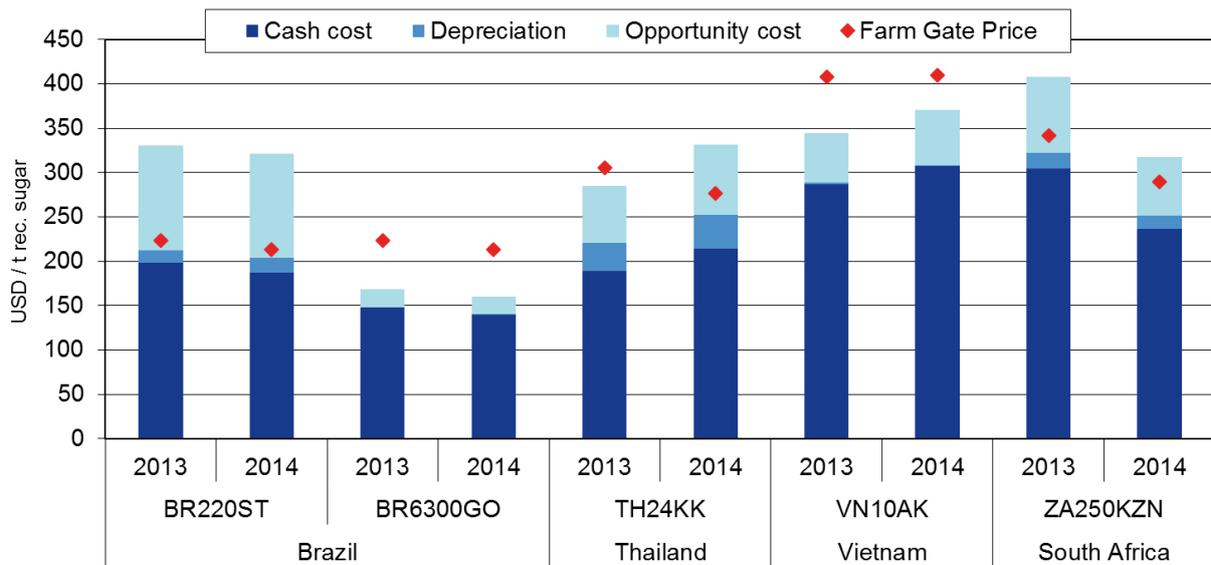


Figure 2. Farm profitability analysis for typical farms in Brazil, Thailand, Vietnam and South Africa (Balieiro et al., 2016)

Conclusion

Once SACGA has completed the project of developing typical farms for the other sugarcane producing regions in South Africa, these farms can be compared to one another. This information is crucial to understanding the variances in production systems. For instance, the Midlands region uses more mechanisation than the South Coast, which is more labour intensive. These typical farms, using data from the LSG Cost Survey, validated at a regional level by a panel of growers and extension officers, will strengthen the data collected by SACGA. Sugarcane growing costs are a critical factor when evaluating sustainability of the industry and have, since its inception, been used to effectively lobby for growers' interests. Other advantages of using typical farm analysis includes agricultural policy analysis, farm management and domestic and international benchmarking.

The typical farm methodology with the *agri benchmark* network has been successfully used in other agricultural sectors in South Africa such as the wheat industry, to accurately reflect the costs of production, compared internationally and used by Grain SA to ensure appropriate tariff protection. Thus, with the increasing international pressure in terms of imports and competition on the South African sugar industry, being part of an internationally recognised and credible system of analysis is highly significant for industry and grower sustainability.

REFERENCES

- Balieiro S, de Witte T and Weerathaworn P (2016). Using production-cost analysis to understand the competitiveness of sugarcane production: A comparison among Thailand, Vietnam, South Africa and Brazil. *Proc Int Soc Sug Cane Technol* 29: 1-10.
- Carter HO (1963). Representative Farms – Guides for Decision Making? *Journal of Farm Economics* 45: 1448-1455.
- Day LM (1963). Use of representative farms in studies of interregional competition and production response. *J Farm Econ* 45: 1438-1445.
- Elliott FF (1928). The "Representative Firm" idea applied to research and extension in agricultural economics. *J Farm Econ* 104: 1438-1445.
- Krug J (2013). The Standard Operating Procedure (SOP): *agri benchmark* Cash Crop – typical farm. The proceedings of the *agri benchmark* Conference Pretoria, South Africa.
- Nicholson RJ and Hurlly K (2017). The South African Canegrowers Association Large Scale Grower Cost Survey: The dynamic use of data over time and changes for the future. *International Journal of Agricultural Management* IJAM-17-86R1.
- Plaxico JS and Tweeten LG (1963). Representative farms for policy and projection research. *Journal of Farm Economics* 45: 1458-1465.
- Zimmer Y and Deblitz C (2005). *Agri benchmark* Cash Crop: A standard operating procedure to define typical farms. Thünen Institute, Braunschweig – Germany. Accessed on 25 February 2016. <http://www.agribenchmark.org/fileadmin/Dateiablage/B-Cash-Crop/Misc/SOP-cashcrop-0512.p>