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The economic feasibility of precision agriculture in Mato Grosso do Sul State, Brazil: a case study

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Abstract

The objective of this study was to carry out a comparative analysis of the costs and economic profitability and viability indicators involved in implementing precision and conventional farming practices using maize and soybean crops in the state of Mato Grosso do Sul, Brazil. After identifying the production costs, analyses of the profitability indicators and viability indicators were carried out. The calculated profitability indicators (gross revenue, gross margin, break-even point, operational profit, and profitability index) presented better economic results under the precision system. For the analysis of the viability indicators, the net present value

method and the internal rate of return method were used to analyze the two production systems, showing smaller investment attractiveness for the conventional farming system than for the precision system, though with a small difference in values. The Monte Carlo method was applied to evaluate investment risk. The selection of the variables to be simulated was based on the sensitivity analysis results, such as production, sale price and input price. The results obtained through simulation led to the conclusion that the risks are low for the two production systems analyzed.

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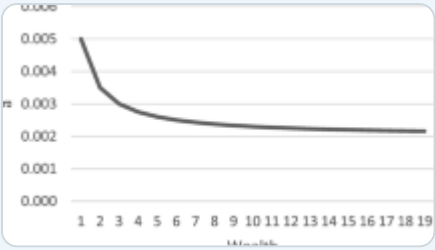

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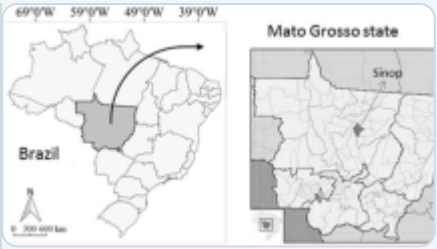

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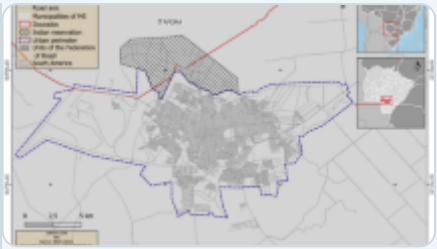

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Notes

1. Fundersul (Fund for development of the highway system in the State of Mato Grosso do Sul) was a tax implemented in June 1999 to maintain and recover the state roads. The Fund capitals are collected through the contribution of direct users of the state roads, such as farmers, slaughterhouses and gas stations owners. It works as a kind of toll that falls upon the ICMS (Taxes on Goods and Services) in inside operations of agribusiness and fuel products. The money collected through the Fund is strictly allocated to road improvements and not any other purposes rather than that. The Fundersul is an item (State tax) that composes the agricultural production cost in the State of Mato Grosso do Sul in Brazil.

References

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532–550.

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Gittinger, J. P. (1982). *Economic analysis of agricultural projects* (p. 505). Baltimore, USA: Johns Hopkins University Press.

Kilian, B., Hurley, T. M., & Malzer, G. (2001). Economic aspects of precision agriculture: an economic assessment of different site-specific N-fertilization approaches. In G. Grenier & S. Blackmore (Eds.), *Proceedings 3rd European Conference on Precision Agriculture* (pp. 521–532). Montpellier, France.

Lambert, D., Lowenberg-Deboer, J. (2000). *Precision agriculture profitability review* (p. 154). Purdue, USA: Site Specific Management Center.

Leftwich, R. H. (1988). *The price system and resource allocation* (p. 648). Hinsdale, USA: Dryden Press.

Lowenberg-Deboer, J., Swinton, S. M. (1995). *Economics of site-specific management in agronomic crops* (p. 29). Purdue, USA: Department of Agricultural Economics.

Molin, J. P. (2001). *Agricultura de Precisão: O Gerenciamento da Variabilidade (Precision Farming: The Variability Management)* (p. 83). Piracicaba, Brazil: Molin.

Myers, M. D. (2002, June 19). Qualitative research in information systems. MIS Quarterly (MISQ Discovery – updated version). http://www.qual.auckland.ac.nz/ Last accessed 26/07/2002.

Pindyck, R. S., Rubinfeld, D. L. (1998). *Microeconomics* (p. 726). London, UK: Prentice-Hall.

Robert, P. C. (2003). *The economical feasibility of precision agriculture* (p. 11). Minnesota, USA: Precision Agriculture Center.

Sterns, J. A., Schweikhardt, D. B., & Peterson, H. C. (1998). Using case studies as an approach for conducting agribusiness research. *International Food and Agribusiness Management Review, 1*(3), 311–327.

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Yin, R. K. (1994). *Case study research* (2nd ed.). Thousand Oaks, CA, USA: Sage Publications.

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