

condition in Brazil. In this context, crop rotation plays an important role in spreading risks associated with seasons and markets. The Southern Brazil holds one of major share of total summer crops production in Brazil. In this season, the variability caused by climatic and economic factors may interfere in crop production. An effective way to reduce agricultural vulnerability to these factors is through the development of knowledge about the behavior of crops production. It may improve agricultural policies and collaborate with decision making by farmers. The objective of this study was to evaluate the feasibility to adopt Time Series models to promote low costs skills about crop production and yield forecasts. Historical data of crop production and yield of soybean and corn of seven mesoregions of Rio Grande do Sul, Brazil, for a period of 35 years (1973–2007) was used in the time series model building. The remaining 4 years data (2008–2011) were used for validation of the model. We propose an approach based on the Auto Regressive Integrated Moving Average models (ARIMA) for soybean and corn production and yield forecasting by the year 2020, based on the following diagnostics: AIC (Akaike's Information Criterion), SBC (Schwarz's Bayesian Criterion), R^2 Adj (Adjusted Coefficient of Determination), MAPE (Mean Absolute Percentage Error) and significance of the parameters ($P \leq 0.05$). The assumption of non-stationarity for summer crops production and yield data was confirmed by the models adjustment. The results demonstrate that different ARIMA models can fit trajectories of summer crops production and yield. ARIMA (0,2,2) and ARIMA (2,2,2) were the best adjusted models for soybean and corn crops production and yield in mesoregions of Rio Grande do Sul, Brazil.

Keywords: ARIMA models; corn; soybean.

An analysis of effects of socio-economic variables on fish production of small farmers in the state of Tocantins, Brazil

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Abstract

In the state of Tocantins, fish farming represents one of the greatest potential for agricultural activities, with considerable growth in recent years and greatly exceeding the value of the fishery. Between 2000 and 2009 the production of farming Tocantins grew 445% from 1102 to 6004 tons. This value is currently 79% of total fish production (farming and fishing) in the state. Fish farming is a strategic sector for both the economy and food security of the state. Apart from being a major source of rural employment and income, fish may also play a role of great importance in environmental state of Tocantins. Fish farming familiar stands out for its strong social and economic appeal, given its potential in terms of food security, income generation and diversification of rural establishments. In this context, it is important that the state of Tocantins has significant deficiencies in terms of their social and economic development. In view of this, in 2008, the Ministry of Fisheries and Aquaculture has started a project aimed to promote the development of fish farming with family farmers in the region of Divinópolis city. The fish farmers began activity in approximate number twenty and the project consisted in the distribution of fingerlings and technical assistance. Today, there are about a hundred fish farm families in the region, with the vast majority entering the activity on their own initiative, encouraged by the experience of the first producers. Fish farming is basically developed autonomously or in small groups, especially in relation to the acquisition of inputs (feed, fingerlings etc.) and construction of ponds. The technological level of fish farmers is low, and the common occurrence of problems related to fish mortality, poor water quality and poor feed management. Therefore, using data collected from the producers, this paper seeks to understand the reasons of socioeconomic difficulty of producing fish. It was found that only 30% of farmers who have already begun to attempt production could ever get to the point of selling their fish. Through the use of econometric models of probability for limited dependent variables, it was found that factors such as participation in federal programs to transfer income, total area of water depth property and local production are key factors in determining the likelihood of producer to sell their fish. A producer who produces on pond, which receives federal financial helps and family who owns a large area of water depth has a high probability of success on their property aquaculture.

Keywords: aquaculture; fish farming; logit; State of Tocantins.