Roongthip Poomkumarn 2012: Forecasting Thailand's Cut-Flower Orchid Export Volume Using Quantitative Models. Master of Science (Agro-Industry Technology Management), Major Field: Agro-Industry Technology Management, Department of Agro-Industry Technology. Thesis Advisor: Assistant Professor Ravipim Chaveesuk, Ph.D. 280 pages.

The purpose of this research was to compare time series forecasting and causal forecasting techniques to forecast Thailand's cut-flower orchid export volume to major markets, i.e., Japan, USA and the People's Republic of China (PRC). For the time series forecasting technique, smoothing models, Box-Jenkins model and backpropagation neural network (BPN) model were evaluated. The BPN model was found to have highest accuracy in forecasting the export volume to the PRC for both 1-month ahead forecast and 12-month ahead forecast whereas Box-Jenkins model was the most accurate in both 1-month ahead forecast and 12-month ahead forecast for USA market. In addition, the seasonal additive smoothing model exhibited most accuracy for both 1-month ahead forecast and 12-month ahead forecast in Japanese market. It was also observed that the 1-month ahead forecast was superior to 12-month ahead forecast for all time series models. Under the causal forecasting technique, linear and nonlinear regression models and BPN model were built to capture the relationship between factors influencing the cut-flower orchid demand and the export volume to each country. The influencing factors were included in the model as 9 independent variables in Japan, 12 independent variables in USA and the PRC or as 2 factor groups in Japan and USA and 3 factor groups in the PRC which were obtained from factor analysis. The dependent variable was Thai cut-flower orchid export volume to each country. Only 1-month ahead forecast was studied under this forecasting technique. Results indicated that stepwise linear regression built from independent variables possessed highest accuracy in forecasting the export volume to USA and Japan. The Japanese model pointed out that Thai-Japanese exchange rate and farm price of cut-flower orchids were the most important variables affecting the export volume. On the other hand, USA model exhibited that the consumer price index 3-month earlier and the Thai-USA exchange rate 2-month earlier were most influential. For PRC market, the BPN model built from factor groups was most accurate and could identify that economic factors and price cut-flower orchid factors had greatest effect on the export volume. The comparison of 1-month ahead forecast revealed that the model built from the time series technique had higher forecasting accuracy than the causal forecasting models.

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