ABSTRACT

The effect of temperature, precipitation, rainfed harvested area, and the amount of work, on the production of honey per beehive in Aguascalientes State, during the October-November harvest season, was analyzed, modeling a dynamic Cobb-Douglas production function, by Two-Stage Least Squares method.

This study was performed with data from 1998 to 2010; agroclimatic information registered by CONAGUA, data about rainfed agricultural production, provided by SAGARPA and INEGI, and production of honey per hive data, obtained with a survey applied to members of “Comité Sistema Producto Apícola del Estado de Aguascalientes, A. C.”. The variable selection criteria, was based on the work of other authors regarding the phenological characteristics of bees, and the main nectar source, as well as economic theory around the design of a production function.

A model based on particular conditions of the explanatory variables, in each apiary each year, was obtained considering 1.014 repetitions, corresponding to 4.901 hives for the period 1998 to 2010, with an R^2 in differences of 0,71; to analyze the consistency of the model, and its predictive capacity, considering the same number of hives, the model was re-estimated using a reduced data panel, starting from 1998 to 2007, getting an R^2 in differences of 0,64; then predictions for the years 2008, 2009 and 2010, were made, which showed an average absolute percentage error of 5,96 % compared to the actual data.

In both models, the short-run elasticities were similar to the long term ones, emphasizing that the long term, were slightly lower, it showed that the system reacts to changes in the short term, which are attenuated gradually over time. This behavior suggests that, the changes in the variables in the short term, may be relevant to forecast the yield of honey per hive.

With the full data panel, honey production under climate scenarios, provided by the INE for the years 2020 and 2050, was simulated, estimating that the average yield

will decrease 1,784 % for the first, and 4,244 % for the second, regarding the observed in 2010; economic losses in Aguascalientes State for $144.876,6, and $344.727,9 (MXN 2013) respectively, were forecasted.

Keywords: beekeeping, econometrics, agroclimatology, bioeconomic model, Aguascalientes State.