Abstract

The present study was conducted to access the need of vegetable growers of West Bengal and to develop a need based Expert-System. Primary data of 210 respondents have been collected from seven districts of West Bengal for the purpose of need analysis. Need analysis revealed eight components of the Expert-System, viz. Botany, Season and Variety, Price Forecasting, Cultivation Practice, Crop Protection, Soil Nutrient, Human Nutrient and Recipe. All components have been developed using Evolutionary model of software development. The secondary data have been retrieved from http://agmarknet.dac.gov.in/ for Price Forecasting module. Six vegetables viz. Brinjal, Potato, Tomato, Chilli, Cabbage and Cauliflower have been included in the developed system. The most frequent occurred 30 disease pests have been identified and included in the Expert-System for their management. Windows operating system and MS Office package is required to run the system. Triple exponential smoothing (Holt-Winters method) has been applied for forecasting the monthly price of vegetables. To measures the accuracy, mean absolute percentage error (MAPE), mean absolute error (MAE) and mean square error (MSE) at different levels of smoothing constants $\alpha$, $\beta$ and $\gamma$ have been used for the model selection criteria. Upper control limit and lower control limit along with forecast value has given a narrow range of forecast that proves its accuracy in forecasting. The system has developed an interactive way to calculate and suggest fertilizer requirement for specific area of land based on input parameters set by any user. The system developed provides the scientific knowledge about variety, season, cultivation practice and important diseases and pest management for major vegetables of West Bengal. In order to make an impact analysis of this Expert-System, some case studies have been done. Case studies show that by using the system farmers have economically benefited. The input cost reduced and production increased. Therefore, wider dissemination of the system can give benefit to more number of farmers in the state.

Key Words: Expert-System, Fertilizer Dose, ICT in Agriculture, Price Forecasting, Vegetables of West Bengal.