



## Section E3

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### Factors affecting variation of production price of potato grown in Welimada

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The price variation in the production price of potato has sometimes negatively affected the farmers as well as customers and on some occasions, the farmers are unable to cover their production cost from the sale of produce. Therefore, it is necessary to find the triggering factors of this problem and propose a feasible solution to decrease the variations. This study investigates the factors affecting the variation of production prices of potato grown in the Welimada area, Sri Lanka. Welimada potato is the major contributor to the total local potato production in both Yala and Maha seasons. The following features are considered as independent variables for predicting the production price of potato grown in the Welimada area: imported potato wholesale prices, producer prices of Nuwara Eliya potato, rainfall, temperature (minimum and maximum) and relative humidity (minimum and maximum) in the Badulla district and the extent and production of Welimada potato. The data for this study was collected from the Meteorological Department of Sri Lanka, The Hector Kobbekaduwa Agrarian and Research Institute and The Census and Statistics department of Sri Lanka, from 2005-2015. Different classifiers are trained to predict the production price, and M5P models gave the best prediction results. The models were trained and tested using 10-fold cross validation. Then, M5 Pruned (smoothed/unsmoothed) model tree, M5P (smoothed/unsmoothed) Regression tree and Linear Regression are trained to predict the production price. M5 Pruned smoothed model tree gives the best prediction quality and hence, it confirms that there is a non-linear relationship between the independent variables and dependent variable. The model shows that the following factors – Nuwara Eliya potato producer and wholesale prices, Welimada potato wholesale price, maximum rainfall in Badulla, and minimum relative humidity – positively contribute towards the production price of Welimada potato; and the extent of potato imported, potato wholesale price, and minimum temperature of Badulla, have negative effects on the production price. The outcome of this study is helpful for farmers to increase their profit of potato farming at Welimada area.

**Keywords:** Factors, potato, production price, M5P model tree, linear regression, weather

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