

Abstract

The studies to improve the efficiency of water and fertilizer to the 3 major fruit trees on highland, including strawberry cape gooseberry and grape, was conducted at Angkhang Royal Agricultural Station, Fang District, Kae Noi Royal Project Development Center, Chiang Dao District and Pang Da Royal Agricultural Station, Samueang District in Chiang Mai Province respectively during February-December 2018. The objective of the studies was to study the patterns and best practices of the watering and fertilizer supplying and also to provide the suggestions on how to save and get efficiency of water and fertilizer use for the fruit trees. The samples of each fruit trees in each the growth stage were collected and recorded for fresh and dry weight of the roots and the stems. The samples were analyzed of the nutrients (N, P and K) using for evaluate the nutrient requirements of the fruit trees. In addition, the amount of fertilizer and water usage and also agro-meteorological data was recorded using to evaluate the water requirement of the fruit trees.

The study indicated that the nutrients requirements of strawberry at Angkhang Royal Agricultural Station were 23.28 kg / rai of nitrogen (N), 2.96 kg / rai of phosphorus (P) (6.81 kg P_2O_5 / rai) and 28.80 kg / rai of potassium (K) (34.56 kg K_2O / rai), and it required 509.7 cubic meters / rai of water. While the best practice of farmers, they used nitrogen fertilizer (N) 68.48 kg / rai, phosphorus 185.92 kg P_2O_5 / rai and potassium 120.64 kg K_2O / rai. The average production cost was found about 55,620 baht / rai. For cape gooseberry production at Kae Noi Royal Project Development Center, there were found that the nutrients requirement were 71.38 kg / rai of nitrogen (N), 15.38 kg / rai of phosphorus (P) (35.37 kg P_2O_5 / rai) and 125.95 kg / rai of potassium (K) (151.14 kg K_2O / rai), and it needs water 619.5 cubic meters / rai. While in the best practice of farmers, they used nitrogen fertilizer (N) 53.76 kg / rai, phosphorus 53.76 kg P_2O_5 / rai and potassium 69.12 kg K_2O / rai, The average production cost was 56,408 baht / rai. For grapes at Pang Da Royal Agricultural Station, the nutrients requirement were 7.07 kg / rai of nitrogen (N), 0.67 kg / rai of phosphorus (P) (1.54 kg P_2O_5 / rai) and 5.76 kg / rai of potassium (K) (6.91 kg K_2O / rai). The water requirement in a season of production was 2,657.7 liters / plant in season 1 (February-June) and 1,891.3 liters / plant in season 2 (August-December). While in the best practice of farmers, they used nitrogen fertilizer (N)

5.02 kg /rai, phosphorus 7.83 kg P_2O_5 /rai and potassium K_2O 9.24 kg /rai with an average production cost of 81,822 baht / rai.

The study indicated that the nutrients requirement or fertilizers of nitrogen, phosphorus and potassium of the most fruit trees showed less than the fertilizer used by farmers 1.5 - 2 times. While the amount and the interval time of watering showed higher than the water requirement by principle of plants, although the farmers had considered to on the variation of weather while they were watering but the remained of soil moisture and the available of soil water just was not considered. For grapes, even in the study plots, there has a good practice and a proper amount of watering that closed to the principle of providing water by the evapotranspiration rates varying according to the weather conditions in each day. However, we found that the available of soil water content during the harvest time was too high to use for grape. Therefore, the appropriate rates of fertilizers and water in fruit trees on highland should be studied using for the available information to get proper and efficiency of fertilizer and water use and save cost of production.

