



ABSTRACT

Box schemes, commonly said as vegetable box, fruit box, or green basket, is a new method to deliver agriculture goods to customers based on the subscription. Box-scheme companies offer the pre-determined baskets containing vegetables and fruit which supplied from farmer partners in the supply chain to their subscribers. It is challenging for box scheme producers to determine the box's contents to ensure consumers' satisfaction while facing price fluctuation. This research defined the content selection problem for fruit-vegetable box as a Multi Knapsack Problem with Setup (MKPS) model to maximize the company's profit. In this work, the various constraints consisting of quantity, variety, weight, and box type were defined. The mathematical model was formulated in Mixed Integer Linear Programming and solved using LINGO solver. The result shows that box companies need higher costs when the nutrient policy is applied, although it is intuitive. Moreover, increasing the number of farmers can decrease total crop costs with extract allocation costs. Sensitivity analysis was also conducted with parameter: allocation cost, demand, and box price to evaluate their impact on profit.

Keywords: box schemes, agriculture supply chain, fruit vegetable selection, knapsack problem