

ABSTRACT

In various industrial sectors, inventory concerning stored products is a key parameter in business operations as it affects the effectiveness and efficiency of company performance. Therefore, an understanding of inventory management from the ordering stage to handling items for warehouse storage is essential. PT XYZ is a company engaged in the palm oil plantation industry located in Central Kalimantan Province. In conducting its business processes, PT XYZ needs to maintain the quality of the palm oil it cultivates, one of the ways being through the provision of growth-supporting elements such as fertilizers. The main type of inorganic fertilizer used by PT XYZ includes four products: NPK, Dolomit, Mamigro, and Libero. These products are stored in PT XYZ's plant nutrition and agrochemical commodity warehouse.

PT XYZ needs to procure these four types of inorganic fertilizers, which are essential for maintaining the palm oil plants' primary nutrient content to ensure the harvested fruit's quality. The company places orders for these products through a single supplier, although orders for each fertilizer product are placed separately. During 2023, the company placed up to 19 orders for inorganic fertilizers due to the absence of a reorder cycle, relying instead on employees' instincts and previous purchase history. This has resulted in high ordering costs. Additionally, the company places large orders to reduce ordering costs, but the ordered quantities do not match the monthly demand, leading to excessive product storage in the warehouse, which results in decreased fertilizer quality and increased holding costs.

The increased ordering and holding costs impact the total inventory costs at PT XYZ. This is due to the lack of an inventory management system for handling products in the warehouse. The company does not consider the demand for fertilizers from other departments, leading to suboptimal shipments and accumulation of inventory in the warehouse. The imbalance between demand and purchase of fertilizer products resulted in a 2023 total inventory cost that exceeded PT XYZ's target by 8%, amounting to Rp 280,964,800.

This final project aims to address these issues by designing an optimal fertilizer inventory policy to minimize total inventory costs. The design method used in this project is the Periodic Joint Replenishment method, which aims to manage inventory for multiple types of products ordered from the same supplier. Data used in this method includes lead time, demand, holding costs, major ordering costs, and minor holding costs. The calculations will yield components such as order interval time, optimal order quantity, maximum inventory level, and safety stock.

The results obtained from applying the Periodic Joint Replenishment method in this project show a total cost of Rp 5,554,953,386. This represents an 11% reduction from the company's inventory cost target and a 16% reduction from the existing total inventory cost, resulting in total savings of Rp 876,011,486 for PT XYZ.

Keywords: Fertilizer, Inventory Policy, Overstock, Periodic Joint Replenishment.