

## **ABSTRACT**

*PT. Pupuk Kujang is a company producing urea fertilizer with a maximum capacity of 1725 tons/day. Based on research conducted, the existing problem in PT. Pupuk Kujang is an over stock of urea sacks caused by the ordering process which refers to the maximum capacity of the plant. Whereas in the current plant conditions, the number of urea fertilizer produced are irregular and did not reach the maximum limit of plant capacity. The over stock problem at PT. Pupuk Kujang can be solved by a probabilistic inventory system of Q Model and P Model. Q Model and P Model are used to determine the optimum number of urea sacks for every purchase, the time to reorder, and finding out the number of safety stock for urea sacks so that the total cost of stock the company issued can be minimized.*

*In this study, the Hadley-Within formula is used on Q Model and P Model. The actual condition of inventory system at PT. Pupuk Kujang resulted in a total inventory cost of Rp1.181.119.710,-, while the calculation Q Model Rp659.032.278,- and P Model Rp994.607.694,-. The purchasing amount of urea sacks of Q Model for every order is about 2.454.316 sheets of urea sacks with reordering point when the number of urea sacks in the warehouse reached 1.554.557 sheets of urea sacks. With P Model the purchase of urea sacks is made every 0,039 year or once every 14 days with an expected maximum inventory of 3.743.704 sheets of urea sacks.*

*In this study, a sensitivity analysis is also conducted. Sensitivity analysis is conducted to determine the size of an impact caused from changing variables which affect the total inventory cost criteria. The variables used are demands of urea sacks, purchasing cost of urea sacks, and holding cost of urea sacks with a range of 5-15%.*

**Keywords:** Q Model, P Model, Hadley-Within, Sensitivity Analysis, Inventory.