

NUTRIENT MANAGEMENT FOR RUBBER PLANTATION USING GOAL PROGRAMMING

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ABSTRACT

Rubber plantation in Malaysia is currently not limited to household consumption, but it can be directly involved in the export and import activities. As we know, plantation of rubber in the Farming Unit of UiTM Perlis has a great potential to grow as it has a high market value. Every year, the Farming Unit staff will fertilize the rubber tree 2 times. The main objective of the study is to minimize the cost of chemical fertilizers used to plant rubber. Besides, the sub-objectives are to determine the best combination of weight for fertilizers used on a rubber tree and to calculate the mass per hectare of Nitrogen, Phosphorus, and Potassium needed for the rubber tree. The data were analyzed using POM-QM software for Windows. In the model formulation, there are seven types of decision variables and three constraints, which are the cost of chemical fertilizers and the requirement of the upper and lower limits of nutrients in the chemical fertilizers. The findings of the study have shown that the fertilizers that would minimize the total cost of rubber plantation are Urea, Muriate of Potash (MOP), and Triple Super Phosphate (TSP) while the compound of NPK applied was 90 kg/ha of Nitrogen, 110 kg/ha of Phosphorus, and 130 kg/ha of Potassium. Results of the model indicated that this method is able to meet all the goals expected. In conclusion, this study shows that goal programming is an effective technique to deal with nutrient management problem.

Keywords: Rubber, fertilizers, goal programming.