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Purchase-oriented Classification Model of the Spare Parts of Agricultural Machinery

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Abstract Based on the classification of spare parts and the research results of the demand of spare parts, a three-dimensional classification model of spare parts of agricultural machinery is established, which includes the application axis sorted by technical characteristics, the cost axis classified by ABC method, and the demand axis classified by the demand of the spare parts of agricultural machinery. These dimension axes represent different factors, and the application of factors in purchase is analyzed. Guiding value of each dimension axis is summarized in the field of the spare parts purchase; and corresponding strategy instruction is put forward. Integrated application of these strategies by model makes the purchase have more realistic operational meaning. Application field of the three-dimensional model of spare parts is discussed; and the direction for further research is pointed out.

Key words Spare parts of agricultural machinery, Demand, Purchase, China

Equipment management is called the life line management in modern enterprise management. And spare parts management is an important content of equipment management. The spare parts management, operation management and maintenance management are together called the three mainstays of equipment management. Therefore, spare parts management directly affects the availability of enterprise equipment and the capital turnover of spare parts inventory. Classification of spare parts is the primary factor for the management of spare parts inventory. And how to effectively classify the spare parts has been the focus of both the science world and business world.

As for the agricultural machinery, its storage and purchase strategy has been a key link of management, which is determined by the property of operation. The ABC classification method is a traditional management method of spare parts^[1]. However, the factors considered in this method are too simple, and can not guide the produce practice well. In the past, researches on spare parts mainly studied on the management of spare parts according to the characteristics of spare parts^[2-7]. And the objective for enterprises to carry out spare parts management was to meet the demands of the normal and orderly production of enterprises. Therefore, when studying on the management of spare parts, there lacks the meaning of actual production due to the neglecting of the factor of spare parts demand.

Demand for spare parts is not only a focus of spare parts research, but also a difficult point. At present, the most commonly used method throughout the world is to divide spare parts into repairable spare parts and non-repairable spare parts. And the demands of the two can be deduced according to the equation^[8]. He Yaqun *et al.* carry out research on the demand of spare parts according to the Rough Set Theory^[9]; Li Jiuxiang *et al.* put forward the calculation model of spare part

quantity with different distributions combining with the demand distribution of spare parts^[10]. According to the continuity of spare parts demand, spare parts can be divided into continuous demand and intermittent demand. Yang Jie *et al.* summarize the forecast methods of intermittent demand, and point out the advantages, disadvantages and applicability of different methods^[11]. Xu Xiaoyan *et al.* divide the demand of spare parts effectively, points out the calculation method of spare parts demand under the situation of subdivision. According to the demand research on spare parts mentioned above, it can be found out that these researches only focus on the demand characteristics of spare parts, and neglect the characteristics of spare parts of equipments. But the factor of cost must be considered during the research on spare parts^[12]. Therefore, this research integrates demand into the characteristics of spare parts and equipments in order to find out a relatively comprehensive and systemic management method and to apply it into the management of spare parts of agricultural machinery.

1 Three-dimensional classification model of the spare parts of agricultural machinery

1.1 Establishment of the three-dimensional axes of the spare parts of agricultural machinery Agricultural machinery is divided into component commonality (A), special purpose component (B), and special-made component (C) according to the technical characteristics^[13]. This classification method focuses on the utilization of the spare parts of agricultural machinery and is used as the application axis of the three-dimensional model. In practice, most of the enterprises still adopt the ABC method in the management of spare parts; and ERP software is developed on the basis of this method^[14]. Therefore, ABC method is used in this research, which pays attention to the cost factor of spare parts and is used as the cost axis of the three-dimensional model. According to the demand of spare parts of agricultural machinery, spare parts are divided into con-

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