Routing Plan of Migratory Bee Colonies in Honey Production

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Abstract

Commercial apiculture plays an important role because of its contributions to reducing poverty and conserving biodiversity. In this paper, honey production by migratory bee colonies are considered. A group of beekeepers move from one region to another region for harvesting honey. The problem involves finding routing plan for the migratory beekeepers to optimize the total profit of beekeepers, comprehensively considering several constraints. A variable neighbourhood search (VNS) algorithm is proposed to solve the problem. A numerical experiment is performed to test to test the effectiveness of the proposed VNS. The results indicate the feasibility and efficiency of the VNS to achieve good near-optimal solutions while reducing computation time sharply compared to exact algorithms. The outcome of this paper can help related organizations to change traditional production and operation methods, enhancing production efficiency and profit and reducing costs and resource waste.

Keywords
Migratory Beekeeping Routing Problem; MBRP; Variable Neighborhood Search; VNS; Vehicle and Routing Problem.