A Comparison of Three Non-Migratory Systems for Managing Honey Bees (*Apis mellifera* L.) in Minnesota

Part II: Economic Analysis[1,2,3]

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Revised Manuscript Received for Publication Sept. 22, 1989

ABSTRACT

Enterprise budgets were prepared for three 2-queen management systems (package colonies, vertical 2-queen, and horizontal 2-queen). Economic comparisons were based on production data and estimated costs for a 500 2-queen unit operation. The horizontal 2-queen management system yielded the most surplus honey and generated the highest gross receipts. The package colony system had the highest operating costs, the vertical 2-queen system the lowest. The net returns above costs shown differed significantly among treatments, with the horizontal 2-queen system showing the greatest return.

INTRODUCTION

SEVERAL COMPARISONS of honey bee management methods have been reported, but few have included an economic analysis. In Manitoba, Braun (1941) found that overwintered colonies were more profitable than package colonies and that divided overwintered colonies increased beekeepers' income. In an economic comparison under commercial conditions in New Zealand, Walton (1974) determined that a 2-queen system used less equipment and less apiary working time per unit of honey produced. However, Walton's study did not set monetary values to these 2 economic measurements.

Recent studies of honey bee management in British Columbia have addressed economic concerns. Scott and Winston (1985) reported that the highest gross income was associated with colonies managed intensively for pollination, honey production, and bee production. Winston *et al.* (1985) found that shaking packages from overwintered colonies increased profits. In both of the British Columbia studies, colonies of honey bees were most profitable when managed intensively.

Although the above comparisons did not use complete economic analyses, other reports have been issued that more thoroughly address the costs and returns of commercial honey production. These reports have often used a sample of beekeepers to obtain consensus costs and returns (Robertson, 1960; Owens *et al.*, 1973; British Columbia, 1979; Andruchow, 1982; MacDonald and Monner, 1984; Murrell, 1988).

Other investigators have analyzed commercial operations of different sizes. Reed and Horel (1976) compiled an economic analysis for a 1000 and a 3000 colony operation. Sanford (1986), in a study designed to help mid-size honey producers better understand costs of and returns from their operations, analyzed the profitability of a 500 colony operation.

In this paper, we examine economic considerations that may be important to sideline and commercial honey producers.

MATERIALS AND METHODS

The experimental design, the 3 management system treatments [2, single season package colonies (2 PK); vertical 2-queen (V2Q); and horizontal 2-queen (H2Q)], and the methods of management for each system were described elsewhere (Duff and Furgala, 1989).

Enterprise budgets are used by producers in management decisions and in planning for the future (Boehlje and Eidman, 1984). Enterprise budgets for each 2-queen management system were developed for the economic analysis of this experiment. These budgets used receipt and cost estimates based on a single owner operator with a 500 2-queen unit operation. Budgets for each system included gross receipts, operating costs, and ownership costs. Returns from each system were calculated.

Gross Receipts

The gross receipts from each of the 3 systems (2PK, H2Q, V2Q) were determined by the quantity and price of honey and beeswax produced.

The quantity of surplus honey was determined by calculating the difference in colony weight before and after harvest. Data from the 3 apiaries were combined to obtain the mean quantity of surplus honey produced by each system. Quantity of beeswax was estimated as 1.5% of the quantity of honey. The average net price of white honey ($0.642/lb) was determined from the 1986-1987 Commodity Credit Corporation loan rates minus the National Honey Board assessment. The price of beeswax was estimated at $0.90/lb.

Operating Costs

Quantities in each budget reflected the requirements of

[1]Published as Paper No. 17,243 of the Scientific Journal Series of the Minn. Agric. Expt. Station on research conducted under Minn. Agric. Expt. Station Project No. MIN-17-023.

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[3]This study was supported, in part, by the Minnesota Honey Producers Association.