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### Adoption of seasonal management practices of apiary colonies by beekeepers

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#### Abstract

The present study was carried out in Chamarajanagar district (Southern dry zone) of Karnataka during 2023 to study the extent of adoption of seasonal management practices of apiary colonies. Sixty beekeepers were interviewed for the purpose. The results revealed that more than three-fourth of the beekeepers (76.66%) were belonging to low to medium adoption category of seasonal management practices of apiary colonies. All the 22 independent variables under study had contributed to the tune of 81.80 percent to the adoption level. Lack of knowledge on seasonal management of apiary colonies among beekeepers was the major constraint faced by majority of beekeepers.

**Keywords:** Adoption, apiary, knowledge, beekeepers, constraints

#### Introduction

Beekeeping is a sustainable form of agriculture as its yield can be increased like other agricultural products by proper management of apiary colonies. Managing honey bees involves seasonal manipulations of hive space to provide room when necessary for the expanding brood-rearing area and for storage of surplus honey. Good management includes reducing colony space during periods of dearth of incoming food, preventing swarming of bees, feeding food supplements to offset any shortcomings in winter stores or to help stimulate brood production during critical periods of colony development, keeping young and good-quality queens in colonies. It is practiced due to its economic and nutritional benefits in the form of honey marketing and consumption at household level. More than 2.50 lakh farmers in India are involved in beekeeping. The average quantity of honey produced per beehive per year in our country was 8.5 kg in 2014, as compared to 1.50 kg during 1953 – 54. During 2017-18, the global market for apicultural products was estimated at USD 8,819 million. The country's apiculture market size was worth INR 16,818 million in 2018 and it is further projected to reach INR 33,128 million by 2024, with 12 percent average growth rate per year during 2019 – 20 (Jagadeesh *et al.* 2023) [3]. In India, currently the total number of bee hives is estimated to be at 12 lakhs. With this background, the present study is carried out with the specific objectives:

1. To study the extent of adoption of seasonal management practices of apiary colonies by beekeepers
2. To know the extent of contribution of profile

characteristics of beekeepers on the adoption of scientific bee keeping practices

3. To identify the constraints encountered during the seasonal management of apiary colonies by the beekeepers

#### Materials and Methods

The present study was carried out in Chamarajanagar district of southern dry zone in Karnataka state during 2023. Chamarajanagar, Kollegal, Yelandur and Gundlupet taluks were selected from Chamarajanagar district for the research study. Fifteen beekeepers from each of the sampled four taluks who were rearing at least five (5) *Apis cerana* colonies formed the sample of the research study. Thus, the total sample constituted 60 beekeepers from four taluks of Chamarajanagar district in Karnataka state. The data was collected using a pre tested interview schedule.

In the present research study, the adoption is operationally defined as 'the extent of seasonal management practices followed by the beekeepers in the apiary colonies'. Thirteen seasonal management practices of apiary colonies classified as summer management practices (4 Nos.), monsoon management practices (4 Nos.) and winter management practices (5 Nos.) were presented to the beekeepers. A score of one was assigned to the practice which the beekeepers were 'not adopting' and the score of two was assigned to the practice which the beekeepers were 'adopting'. Thus a minimum and maximum adoption score one could get was 13 and 26, respectively. The respondents were classified based on mean (17.50) and half standard deviation (1.40) as follows:

Adoption category	Score
Low	<16.10
Medium	16.10-18.90
Low	>18.90

Information regarding the 22 profile characteristics (age, education, family size, farm size, farming experience, number of bee hives, experience in beekeeping, annual income, innovativeness, achievement motivation, scientific orientation, risk orientation, cosmopolitaness, decisions making ability, credit orientation, market orientation, economic motivation, social participation, mass media exposure, training on beekeeping, extension agency contact and extension participation) of beekeepers were measured using a standardized procedure and scale. The collected data were scored, tabulated and analyzed using frequency, percentage, mean, standard deviation and multiple regression analysis.

**Results and Discussion**

**Adoption of seasonal management practices of apiary colonies by beekeepers**

The results in Table 1 reveals the findings on the adoption of seasonal management practices of apiary colonies by the beekeepers. In the respect of summer management practices, it is observed from the results that a majority of the beekeepers had not adopted the practices such as: colonies

not kept in thick shade (81.67%), provision of proper ventilation in the colony by widening the entrance gate of the colony (61.67%), regulating the hive temperature of the apiary by using wet gunny bags on top cover (55.00%) and provision of fresh water in/near the apiary (53.33%).

In regard to the monsoon management practices of apiary colonies, a simple majority of the beekeepers had provided artificial feeding (sugar syrup/pollen substitute) as per the requirement of the colony (53.33%), while less than half of the beekeepers had not adopted the practices such as: uniting weak/laying worker colonies with strong colonies (61.67%), cleaning and deep burying of the debris lying on the bottom board (60.00%) and checking the robbing within the apiary (58.33%).

With regard to the winter management practices of apiary colonies, it is found that majority of the beekeepers had not adopted the practices such as: uniting weak/laying worker colonies with strong colonies (80.00%), protect the colonies from chilly winds by using wind breaks (73.33%), examining the colonies and providing winter packing in weak colonies (63.33%), feeding sugar/pollen substitute to weak colonies (61.67%) and shifting the colonies to sunny place (56.67%).

The results reveals that more than half of the beekeepers had not adopted the summer, monsoon and winter management practices of apiary colonies.

**Table 1:** Adoption of seasonal management practices of apiary colonies by (n=60)

Sl. No.	Seasonal management practices	Extent of adoption			
		Non adoption		Adoption	
		No.	%	No.	%
<b>1. Summer management practices</b>					
a.	Colonies kept in thick shade	49	81.67	11	18.33
b.	Regulating the hive temperature of the apiary by using wet gunny bags on top cover	33	55.00	27	45.00
c.	Provision of proper ventilation in the colony by widening the entrance gate of the colony	37	61.67	23	38.33
d.	Provision of fresh water in/near the apiary	32	53.33	28	46.67
<b>2. Monsoon management practices</b>					
a.	Cleaning and deep burying of the debris lying on the bottom board	36	60.00	24	40.00
b.	Checking the robbing within the apiary	35	58.33	25	41.67
c.	Uniting weak/laying worker colonies with strong colonies	37	61.67	23	38.33
d.	Provision of artificial feeding (sugar syrup and/or pollen substitute) as per requirement of the colony	28	46.67	32	53.33
<b>3. Winter management practices</b>					
a	Examining the colonies and providing winter packing in weak colonies	38	63.33	22	36.67
b	Feeding sugar/pollen substitute to weak colonies	37	61.67	23	38.33
c	Shifting the colonies to sunny place	34	56.67	26	43.33
d	Protect the colonies from chilly winds by using wind breaks	44	73.33	16	26.67
e	Uniting weak/laying worker colonies with strong colonies	48	80.00	12	20.00

**Overall adoption of seasonal management practices of apiary colonies by beekeepers**

A bird’s eye view of the Table 2 reveals that as high as 46.66 percent of the beekeepers were belonging to low adoption category, while 30.00 and 23.34 percent of the beekeepers were belonging to medium and high adoption category of seasonal management practices of apiary colonies, respectively. It could be concluded from the findings that more than three-fourth of the beekeepers (76.66%) were belonging to medium to low adoption category. A majority of the beekeepers were not adopting the summer, monsoon and winter management practices, hence it is found that more than three-fourth of the

beekeepers (76.66%) were belonging to medium to low adoption category of seasonal management practices of apiary colonies. The results are in line with the findings reported by Devapriya (2020)<sup>[1]</sup> and Ishita Mishra (2022)<sup>[2]</sup>.

**Table 2:** Overall adoption of seasonal management practices of apiary colonies by beekeepers

Sl. No.	Adoption category	Beekeepers	
		No.	%
1	Low	28	46.66
2	Medium	18	30.00
3	High	14	23.34
Total		60	100.00

**Extent of contribution of profile characteristics of beekeepers on the adoption of seasonal management practices of apiary colonies**

Table 3 reveals that education, family size, farming experience, experience in beekeeping, innovativeness, achievement motivation, scientific orientation, risk orientation, cosmopolitaness, decision-making ability, credit orientation, market orientation, economic motivation, mass

media exposure, training on beekeeping, extension agency contact and extension participation were significantly contributing to the adoption of seasonal management practices of apiary colonies. All the 22 independent variables had contributed to the tune of 81.80 percent ( $R^2= 0.818$ ) to the adoption of seasonal management practices of apiary colonies. Similar findings were reported by Devapriya (2020)<sup>[1]</sup> and Ishita Mishra (2022)<sup>[2]</sup>.

**Table 3:** Extent of contribution of profile characteristics of beekeepers on the adoption of seasonal management practices of apiary colonies (n=60)

Sl. No.	Profile characteristics	Regression coefficient	SE of Regression coefficient	't' value
1	Age	0.229	0.312	1.362 <sup>NS</sup>
2	Education	0.130	0.299	2.301*
3	Family size	0.168	0.412	2.452*
4	Farm size	0.309	0.462	1.495 <sup>NS</sup>
5	Farming experience	0.198	0.505	2.551*
6	Number of bee hives	0.241	0.382	1.585 <sup>NS</sup>
7	Experience in beekeeping	0.153	0.401	2.620*
8	Annual income	0.745	0.845	1.340 <sup>NS</sup>
9	Innovativeness	0.190	0.409	2.150*
10	Achievement motivation	0.115	0.271	2.356*
11	Scientific orientation	0.172	0.400	2.325*
12	Risk orientation	0.309	0.271	2.301*
13	Cosmopolitaness	0.300	0.692	2.306*
14	Decision making ability	0.245	0.612	2.497*
15	Credit orientation	0.111	0.282	2.540*
16	Market orientation	0.116	0.300	2.586*
17	Economic motivation	0.212	0.511	2.410*
18	Social participation	0.911	0.899	0.986 <sup>NS</sup>
19	Mass media exposure	0.291	0.599	2.058*
20	Training on beekeeping	0.249	0.682	2.731**
21	Extension agency contact	0.200	0.401	2.010*
22	Extension participation	0.301	0.919	3.053**
$R^2$		0.818		

NS= Non-significant; \*=Significant at 5%; \*\*= Significant at 1%

**4. Constraints encountered in the seasonal management of apiary colonies by beekeepers**

Table 4 presents the data on the constraints encountered by beekeepers in the seasonal management of apiary colonies. As many as eight constraints were encountered by the beekeepers in the seasonal management of apiary colonies. More than three-fourth of the beekeepers had no knowledge on the seasonal management practices, while less than half of the beekeepers did not get family support for rearing honey bees (43.33%), non-co-operation/hostility of

neighbours (40.00%), lack of bee flora (36.67%), difficulty in frequent inspection of bee colonies (33.33%), pollution (33.33%), fear of bee stings (31.67%) and lack of skill in operating/using bee equipment (21.67%). Hence, the Karnataka State Department of Horticulture, LAMPS etc., should address the above problems for getting higher productivity of honey and optimum income by the beekeepers. Similar findings were reported by Sumit (2018)<sup>[4]</sup>, Vikas Bajpai (2019)<sup>[5]</sup> and Devapriya (2020)<sup>[1]</sup>.

**Table 4:** Constraints encountered by bee keepers in selected agro climatic zones of Karnataka (n=60)

Sl. No.	Constraints	Beekeepers	
		No.	%
1	Lack of knowledge on seasonal management practices	46	76.66
2	Lack of family support	26	43.33
3	Non- cooperation /hostility of neighbours	24	40.00
4	Lack of bee flora	22	36.67
5	Difficulty in frequent inspection of bee colonies	20	33.33
6	Pollution (vehicle /industrial/ agricultural) affecting the floral habitat	20	33.33
7	Fear of bee stings	19	31.67
8	Lack of skill in using beekeeping equipment (smoker, bee veil, hive tool, uncapping, knife etc..)	13	21.67

### Conclusion

The results revealed that more than three-fourth of the beekeepers were belonging to low to medium category of seasonal management practices of apiary colonies. Mass media exposure, training on beekeeping, extension agency contact and extension participation of beekeepers had significantly contributed to the adoption of seasonal management of apiary colonies. The mass media may print/broadcast/telecast on the scientific bee keeping practices in local language for the benefit of beekeepers for increasing their knowledge and adoption of seasonal bee keeping practices. Further, ample opportunities need to be provided by Karnataka State Department of Horticulture, LAMPS etc., for beekeepers to participate in extension educational activities (training, discussion, demonstration etc.) on scientific beekeeping practices which help the beekeepers to get increased honey yield and income.

### References

1. Devapriya SK. Multidimensional analysis of Apipreneurship prospect in South Kerala. M. Sc. (Agri.) Thesis (Unpub.). Kerala Agric. Univ., Thrissur; 2020.
2. Mishra I. A study on adoption of recommended beekeeping practices in Kumaon hills of Uttarakhand. M. Sc. (Agri.) Thesis (Unpub.). G. B. Pant University of Agriculture and Technology, Pantnagar; 2022.
3. Jagadeesh V, Lakshminarayan MT, Krishnamurthy B, Shivaramu K. Perception of beekeepers towards beekeeping in coastal zone of Karnataka state. *Mysore J Agric Sci.* 2023;57(1):102-108.
4. Sumit. An economic analysis of beekeeping: Production and marketing of honey in Haryana. Ph.D. Thesis (Unpub.). Choudhary Charan Singh Haryana Agric. Univ., Hisar; 2018.
5. Bajpai V. Determinants of entrepreneurship development in beekeeping: A case study of Punjab. Ph.D. Thesis (Unpub.). Punjab Agric. Univ., Ludhiana; 2019.