

International Journal of Statistics and Applied Mathematics

ISSN: 2456-1452
Maths 2023; SP-8(4): 417-419
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<https://www.mathsjournal.com>
Received: 03-05-2023
Accepted: 08-06-2023

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Adoption of recommended beekeeping practices in Kumaon Hills of Uttarakhand

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Abstract

India ranks first in terms of number of beehive stocks and eighth in terms of honey production. The major reason for this difference may be the farmers not aware about various modern day beehive management and production technologies. Nainital district of Uttarakhand was purposively selected for the study as it accounts for the maximum number of beekeepers among all the districts in the Kumaon Hills. Nainital district has eight blocks, out of which Bhimtal block was selected purposively for the study as it has maximum honey production. Top four honey producing villages Jeoli, Gaga, Bhaluti and Chopra were selected purposively from the Bhimtal block. A total 76 respondents were selected by census method from the four villages having a minimum of five year of experience and minimum number of ten boxes. The findings of the study reflect that a majority of the farmers (68.42%) had medium extent of adoption of recommended beekeeping practices. Extension personnel and agriculture scientist might have enhanced honey production through regular visit, training and guidance to farmers.

Keywords: Jeoli, Gaga, Bhaluti

Introduction

India is a land with abundance of natural resources and favourable environment for the cultivation of various agricultural crops, still there are many limitations in the Indian agrarian system. Small land holdings, unorganized institutional credit, unpredictable market fluctuations and weak extension system are the major limitations faced by the Indian agrarian system. In India there is always a risk of natural uncertainty like floods, drought, hailstorms etc. Agriculture and allied sector are one of the major livelihood providers in India, especially in reference to the rural areas. To utilize the Indian natural resources to maximum there is a need to shift from the traditional farming system to the modern one. To supplement the farmers income in India there is an urgent need to introduce various agriculture practices together with traditional farming system. One such major enterprise that is gaining popularity in the current scenario is “apiculture” commonly referred to as beekeeping. Beekeeping is the maintenance of honey bee colonies, commonly in hives, by humans.

Traditional beekeeping with *Apis cerana* is widely practised by rural people in Uttarakhand who inherited the tradition from their forefathers and maintain it to this day. There are around 2,50,000 beekeeping units in India out of which only 8,700 are in Uttarakhand accounting for about 2500 MT of honey production in 2016-17. Uttarakhand is extremely rich in Bee forage plants but the use of this rich resource is not being made properly. Around 20.00 per cent of the Beekeepers in Uttarakhand do not use any medicine for the management of pest and diseases showing that the farmers are not much aware of the advance methods of beekeeping. Therefore, there is an urgent need for the farmers in Uttarakhand to know about various modern-day Bee rearing practices.

Material and Method

The study was conducted in the Nainital district in Kumaon Hills of Uttarakhand. Bhimtal block was selected Purposively for the study as it accounts for maximum number of beekeepers as reported by the State Beekeeping Research Centre, Jeolikote. Four villages were purposively selected for the study as the villages accounted for the maximum Honey production in the district.

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The respondents were selected on the basis of census method from the list of beekeepers obtained from State Beekeeping Research Centre, Jeolikote. A list of registered beekeepers from the selected districts was obtained and accordingly the number of beekeepers were selected by census method from each village. A total sample of 76 Beekeepers was obtained from the four villages which included 40 respondents from Jeoli village, 17 respondents from Chopra, 14 from Bhaluti and 5 from Gaga village. Household survey was conducted and data was collected using a semi-structured schedule through face-to-face interviews with 76 Beekeepers, selected for the study purpose. The inquiry yielded results, which led to a conclusion.

Results and Discussions

There is a vast potential for beekeeping in the country as well as in the state of Uttarakhand. However, due to lack of knowledge, modern beekeeping practices are not being followed by the Beekeepers. A Beekeeper should always use recommended methods to control swarming, division of colonies, uniting of colonies, mass queen rearing, etc. With the advent of modern recommended beekeeping practices, a great emphasis is being paid by both scientists and extension workers to enhance honey production. Various experiments and researchers have been conducted for gaining high honey production. The resourceful use of recommended technologies to their preference will enable the potential uses i.e the Beekeepers to enhance the honey production, which in turn can improve their economic status. This seems possible

only when the beekeepers will adopt the recommended improved cultivation practices according to their preferences. Table (1.00) shows the different recommended beekeeping practices as recommended by national bee board along with the percentage and number of the respondents who had adopted, partially adopted and not adopted these practices. The results reflected that the two most commonly reared recommended bee species are indica and mellifera. The practices adopted by the highest number of respondents according to weighted mean score includes adoption of general colony hygiene in apiary like cleaning bottom board frequently (100.00%), monitoring of colonies from ectoparasite mites and adoption of control measures (100.00%), ensuring that the colonies reach destination within 10-12 hours (100.00%), discarding of Old and dark combs (100.00%) and Provision of 50 per cent sugar syrup during the time of dearth period (100.00%). The reason for 100.00 per cent adoption of the above-mentioned practices is that these practices are the most common ones and are being followed by the old aged ancestors. The least adopted recommended practices include adoption of ‘shock swarm’ or shaking method to remove contaminated swarms (0.00%), replacement of old queen and rearing of queen bee through mass queen rearing method (0.00%), capturing of few natural bee colonies from the forest to prevent inbreeding among the bees and rearing of bee in hives as per the specification of BIS/ ISI made up of locally available light seasoned woods (0.00%). The reason for low adoption is that there are no proper trainings for promotion of these recommended practices.

Table 1: Adoption of Recommended Beekeeping practices

| S. No | Practices | Extent of adoption of recommended beekeeping practices | | | | | | Weighted mean score |
|----------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------|--------|-------------------|-------|-------------|--------|---------------------|
| | | Adopted | | Partially Adopted | | Not Adopted | | |
| | | f | % | f | % | f | % | |
| Box management practices | | | | | | | | |
| 1 | Rearing of improved bee species | 76.00 | 100 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 2 | Boxes made of locally available woods | 4.00 | 5.20 | 72.00 | 94.8 | 0.00 | 0.00 | 1.05 |
| 3 | Hives as per the specification of BIS/ ISI | 0.00 | 0.00 | 0.00 | 0.00 | 76.00 | 100 | 0.00 |
| 4 | Row to row and box to box distance of 10 and 3 feet respectively | 23.00 | 30.26 | 38.00 | 50.00 | 15.00 | 19.74 | 1.10 |
| Hive management practices | | | | | | | | |
| 5 | Capturing of natural bee colonies | 0.00 | 0.00 | 0.00 | 0.00 | 76.00 | 100.00 | 0.00 |
| 6 | General colony hygiene practices | 76.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 7 | Inspection of colonies on clear sunny days | 68.00 | 89.48 | 8.00 | 10.52 | 0.00 | 0.00 | 1.89 |
| 8 | Frames stored in air tight chambers and Sulphur fumigated | 0.00 | 0.00 | 29.00 | 38.15 | 47.00 | 61.85 | 0.38 |
| 9 | Discarding of old and dark combs | 76.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 10 | Honey extraction before migration | 63.00 | 82.90 | 13.00 | 17.10 | 0.00 | 0.00 | 1.82 |
| 11 | Colonies reaching destination within 10-12 hours | 76.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 12 | Shifting of beehives seasonally | 59.00 | 77.64 | 17.00 | 22.36 | 0.00 | 0.00 | 1.77 |
| 13 | Rearing of queen bees by mass queen rearing method | 0.00 | 0.00 | 0.00 | 0.00 | 76.00 | 100.00 | 0.00 |
| Feed provision practices | | | | | | | | |
| 14 | Provision of 50% sugar syrup during dearth period | 76.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 15 | Feeding of the colonies after sunset | 67.00 | 88.15 | 9.00 | 11.85 | 0.00 | 0.00 | 1.88 |
| 16 | Provision of pollen substitute | 5.00 | 6.58 | 24.00 | 31.57 | 47.00 | 61.84 | 0.44 |
| 17 | Provision of artificial feeding and checking of robbing of the feed | 61.00 | 80.26 | 15.00 | 19.74 | 0.00 | 0.00 | 1.80 |
| 18 | Provision of sugar/ pollen substitute to increase brood rearing | 62.00 | 81.58 | 14.00 | 18.42 | 0.00 | 0.00 | 1.81 |
| 19 | Union of week / laying worker colonies | 58.00 | 76.32 | 18.00 | 23.68 | 0.00 | 0.00 | 1.76 |
| Disease and pest management practices | | | | | | | | |
| 20 | Monitoring the colonies from ectoparasite mites | 76.00 | 100.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.00 |
| 21 | Adoption of ‘shock swarm’ technique | 0.00 | 0.00 | 0.00 | 0.00 | 76.00 | 100.00 | 0.00 |
| 22 | Use of antibiotics | 63.00 | 82.90 | 13.00 | 17.10 | 0.00 | 0.00 | 1.82 |

Extent of adoption of Recommended Beekeeping Practices: According to Table 2 more than the half of the Beekeepers

(68.42 %) had medium extent of adoption of recommended beekeeping practices while 14.47 percent and 17.11 percent of

the beekeepers had low and high extent of adoption of recommended beekeeping practices respectively. Three categories of low, medium and high were made on the basis of Mean (30.47) and Standard deviation (2.65). The values of Mean+ SD and Mean-SD are 33.12 and 27.83 respectively. As per data in Table 2, maximum number of respondents had medium extent of adoption. The findings of the study are in line with the outcome reported by Mahapatra (2014) ^[5].

Table 2: Extent of Adoption of Recommended Beekeeping Practices

| S. No | Categories | Frequency | Percentage |
|-------|---------------------------------|-----------|------------|
| 1 | Low (less than 27.83) | 11 | 14.47 |
| 2 | Medium (between 27.83 to 33.12) | 52 | 68.42 |
| 3 | High (more than 33.12) | 13 | 17.11 |
| | Total | 76 | 100 |

Conclusion

The advent of frame hives made it possible for the bees to be managed, hives to be moved around to appropriate places, and honey production to be increased to commercial levels. A Beekeeper should always use recommended methods to control swarming, division of colonies, uniting of colonies, mass queen rearing, etc. With the advent of modern recommended beekeeping practices, a great emphasis is being paid by both scientists and extension workers to enhance honey production. The following conclusion can be drawn in the light of stated findings. The majority of the beekeepers in Kumaon Hills of Uttarakhand had medium level of extent of adoption of Recommended Beekeeping practices.

Conflict of Interest

The authors have no conflicts of interest.

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