



On farm Evaluation and Demonstration of Nuclei Box Trapper of Bee Colony

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Abstract

Colonies of bee are trapped and transferred to modern hive using traditional bee hive in the modern bee keeping system, which is time taking tedious and causes for 100% absconding, unless queen is not forced to stay in the new hive for some days by using queen- cage or closing the entrance of modern hive by small sized queen excluder. The Objectives of the study was to evaluate different sized nuclei box and recommend the best one which could make transfer of bee easier safer, with minimum absconding and even to make possible bee transfer any time. For this a study titled “on form evaluation and demonstration of nuclei box as a colony trapper” was undertaken. The test was conducted in Jimma zone purposively selected 3 woredas namely Karsa, Mana and Goma, from these words 3 farmers were selected randomly, on their respective farm (apiculture) a total of 72 differed sized box’s size A,B,C which can accommodate 3,4,5 frames respectively were distributed and made ready to capture colony of bee. A pole of 10m height was installed (erected) on each site (9m above ground) starting from one meter above ground 3 different sized box (A, B, C) were arranged in rows with the internal of one meter up to 8m high on the pole and stayed there for 10 days 25/2/2002- 4/3/2002 (pick colony moving time in selected woredas).

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A person was assigned to register the size of box and height preferred by bee colony sequentially accordingly a four framed box was found to be highly preferred by colony. And the trapped colonies were taken to the modern hive in which it was transferred and made to stay on the top for a minimum of 5 days so to make bees adapt the new environment, finally a total of 47 trapped bee colonies were transferred and data were collected and analyzed. The four (4) framed box size was demonstrated in Saka and Mana of Jimma zone and Yayu and Beddelle Wordas of Illuababor zone. As a test result and farmers feedback during demonstration shows this technology is the best one ever practiced by our beekeepers for transferring colony of bee. Thus we recommend the intensive popularization of this technology, which we hope it will bring a change.

Keyword: nuclei box; colony trapping; evaluation.

1. Introduction

The contrast agro-ecological conditions and availability of diverse floral resources make Ethiopia as one of the very conducive place for the existence of 10 million of honeybee colonies [1], of which farmers keep about seven million in hives and the remaining exist as wild in forest and caves [2]. In Ethiopia Beekeeping is a promising non-farm activity for the rural households. It contributes to the incomes of households and the economy of the nation. The direct contribution of beekeeping includes the value of the outputs produced such as honey, bee wax, queen and bee colonies, and other products such as pollen, royal jelly, bee venom, and propolis in cosmetics and medicine [3]. Beekeeping is an important component of agriculture and rural development program in many countries.

The role of beekeeping in providing nutritional, economic and ecological security to rural communities at the household level and is an additional income generating activity in the country economy. This, being a non-land-based activity, does not compete with other resource demanding components of farming systems [4]. It also provides an employment opportunity in the sector. The exact number of people engaged in the honey sub-sector in Ethiopia is not well known. However, it is estimated that more than one million farm households are involved in beekeeping business using the traditional, intermediate and frame beehives [5].

Ethiopia is among the leading honey producers in Africa and has the natural resources to further increase its production. Most of the honey produced is consumed locally, and the export quantity compared to total production is very low. However, the level of table honey is gradually increasing, though still very low, due to the expansion of modern beehives and private sector involvement in setting up industrial honey processing resulting in obtaining good quality table honey that meets export requirements.

Beekeeping also plays a significant role in the country's food production through honeybee pollination services of major cultivated crops. The role it plays in enhancing food security, poverty reduction and food production through pollination of crops has become substantial in the recent years [6]. About one third of all plants or plant products eaten by humans depend directly or indirectly on bees for their pollination [7].

In modern beekeeping system hives are recommended to sit on their sits which is only 45-90cm above the ground. Because of this most of the time colonies of bee are trapped and transferred to them using traditional

hives which are easy and light to hang on long trees. But the transferred bee through this method does not want to stay in their new hive. This is because the transferred colony faces two very annoying conditions like environmental change and internal disturbance (breakage of combs); to let the transferred colonies stay in their new hive force fully using queen cage and closing the bee entrance by small sized queen-excluder have been recommended.

But using these techniques by itself is somewhat tedious and needs technical capability. To solve this problem evaluation of different sized nuclei box for taping bee colony and transfer was undertaken in JAERC. According to the test result a box with 4 frames is recommended based on their cost and result of bee preference.

Objectives

To evaluate different sized nuclei box for bee colony trapping

2. Material and Method used

The research was conducted in Jimma purposively selected three Woredas namely, Karsa, Mana and Gommaa. A nucie box has 25cm to 26cm external and internal heights respectively. In each Woreda one site was selected and a total of 24 nuclei box 50cm X 25cm were given. To each of them a 10 meter pole was installed and three different sized nuclei boxes with the capacity of accommodating 3,4 and 5 frames were hanged on row on the pole with the interval of one meter, high that is 1,2,3... 8m high. A person was assigned to register the sequence of bee iterance on the given height and width of nuclei box. Boxes with trapped colonies was placed over the modern beehive in which it is going to be transferred and let to stay there for a minimum of 4 to 5 days so as to adapt the new environment and then transferred to modern bee hive as shown on figure 3. Data's were collected and analyzed using simple statistical tools. The distributed 24 nuclei boxes were divided in to 3 equal group (group A,B,C) and each boxes in group A,B, and C could accommodate 3,4,5 frames respectively.

3. Result and discussion

As the test result shows the preference of entrance and height has direct relationship i.e. as the height on which the box hanged increases the preference of bee entrance also increases.

According to the collected data from each sites 42.55% of the trapped bee colony preferred the box with 4 frames and 31.91% of the trapped bee colony preferred a nuclei box which could accommodate 5 frames (as shown on table1).

During conducting experiment we have transferred a total of 47 trapped colonies from nuclei box to modern beehive, of these transferred bee colony only two (2) absconding were registered within a month. Even the two absconding were registered after 5 days of bee transfer). The entrance of modern beehives was kept open in all case. In this situation the register absconding was only about 4.1% where as in transferring bee colony from traditional hive to modern bee hive with keeping the iterance of MBH open it is 100% (according to feedback from farmers (table 2).



Figure 1: nuclei box produce in the center work shop



Figure 2: Hanged nuclei box to trap colony of bee during demonstration



Figure 3: Nuclei boxes with bee colony ready to transfer



Figure 4: Demonstration of the nuclei box in Illubabor zone Tullube kebele

As it has been observed the average time taken to transfer trapped bee colony to modern beehive is about thirty (30) minutes which is by far less than that of time taken by the existing trend .Which ranges from two to three hrs. According to feedback from farmers. The maximum cost of production for 3, 4, 5, framed box is 40, 48, and 59 birr respectively.

Transfer of bee is possible any time i.e. it does not depend on season because when colony is transferred from framed nuclei box it will be transferred with all materials it established like comb, honey larva collected pollen. On the contrary transferring from traditional bee hive is only possible at pick flowering season because bees are obliged to live in empty hive [8].

Table 1: bee preference vs. size of box

Sites	Trapped colonies using dif. sized nuclei box within ten (10) days								
	3 framed			4 framed			5 framed		
	Hanged	Bee interred	Preference %	Hanged	Bee interred	Preference %	Hanged	Bee interred	Preference %
Kersa	8	3	37.5	8	7	87.5	8	5	62.5
Gomma	8	5	62.5	8	7	87.5	8	5	62.5
Manna	8	4	50	8	6	75	8	5	62.5
Weighted mean average			25.54			42.55			31.91

Table 2: showing colony trapped and transferred in hive with open entrance with registered absconding

Sites(weredas)	No of trapped colony using	No of transferred colony to modern beehives with open bee entrance	No of colony left the hive with one month	% of absconding
	NB	NB	NB	NB
Karsa	17	17	0	0
Gomma	18	18	0	0
Manna	13	13	2	15.3
Total	48	48	2	4.1

4. Economic benefit

The cost of recommended nuclei box is currently about 200 birr but the cost of traditional beehive is 30 birr. This implies if it is totally made of wood it costs the user additional 170birr (200-30). But losing a colony of bee costs the user about 300 birr excluding loss of time, energy and other inconveniencies .Hence, using this beehive is economically visible for the user as shown on figures.

5. Demonstration of the technology

After we have got promising result from evaluation of nuclei box, demonstration were made in two districts of each zones namely: Kerssa and Seka Woreda of Jimmaa zone and Yayu and Bedele of Illubabor zone. Purposively ten (10) farmers were selected from each district, a total of forty (40) farmers were given the nuclei box and training on the use and bee transferring method were given.

After technology dissemination farmers' feedback on the technologies were collected and according to farmers feedback the nuclei box have got great advantage over traditional transferring method by parameters like: ease of transfer, with almost no absconding, time saving in transferring bee colonies.

6. Conclusion and recommendation

Of the three different sized nuclei box i.e: (box with three, four, and five frames) the nuclei box with four frames was preferred by the bees at all the heights which was followed by 5framed box. The preference percentage was 42.55 and 31.91 respectively.

So based on the bee preference and manufacturing cost of the nuclei box we recommend the 4 framed box. We also highly recommend intensive popularization of this valuable and easy technology for bee trapping bee colonies, which we think it will bring breakthrough in modern bee keeping system.

7. General User's feed back

All farmers who participated in test sites and demonstration program have highly appreciated this technology, because it solves their problem of bee transfer from traditional beehive, which they have been facing for the last two decades.

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