On-farm demonstration of splitting queen rearing technique in Eastern Amhara Region, Meket woreda

Tessema Aynalem and Wondimagegn Bekele
Sirinka Agricultural Research Center

Abstract

The splitting technique was demonstrated in meket *woreda*, north wollo zone; where beekeeping activity is predominantly exercised by many farmers. By using this technique, all participant farmers have got on average new daughter colony of 1.09 per hive. The splitting technique has been highly accepted by beekeepers. Out of the total splitted colonies, 67% has adapted and 33% has absconded due to long lasted severe drought in the area during the experimental period. Thus, to encourage farmers and to scale up this technique, the government should focus on creating marketing opportunities for bee colonies produced by the beekeepers.

Key words: Honeybees, queen, rearing, splitting.

Introduction

The diversified agro climatic condition of the country, create environmental conditions conducive for the growth of over 700 species of flowering plants. The high proportion of Ethiopian plants is endemic to the country (Edwards, 1976). The ideal climatic conditions and diversified floral resources allow the country to sustain around 10 million honeybee colonies of which 7 million are kept in different hives by farmers and the remained exist in forest as wild colonies (EMA, 1981).

Beekeeping is the long standing practice in the rural communities of Ethiopia and it appeared as the history of the country (Kassaye, 1990). However, the type of beekeeping practiced in the country is largely traditional, which is being carried out in traditional hives of different types and it vary depending on the ecology and behaviors of the bees (Nuru, 2007).

At present, due to various factors, the populations of honey bee colonies are certainly in the state of continuous decline. As the result, it is becoming more difficult to obtain adequate swarms every year to expand the apiary (Nuru, 2007).

In highlands and mountainous areas of Ethiopia, the swarming tendency of the honey bee colonies is very low. As the result the price of the colony is very high and becoming a good source of income to beekeepers (Nuru, 2002). In these areas where reproductive swarming tendency is low, one of the major problems of apiculture is obtaining swarms either to start or to increase the existing stock. So in these areas, developing simple ways of colony multiplication skills such as splitting queen rearing would be very important. The technique has been proven to be efficient for local honey bee colonies (Nuru and Dereje, 1999). It has also been proven and became effective in western Amhara region and recommended to be done in different potential beekeeping districts of the region where there is promising bee forages and scarcity of the honey bee colonies (Adebabay, 2007).

Thus, it is justifiable to demonstrate the splitting queen rearing technique with regard to honey bee colony multiplication under farmers' condition in Eastern Amhara Region. Hence, the objective of this study was to demonstrate splitting queen rearing technique in Eastern Amhara Region under farmers' management condition.

Materials and methods

The study Area

The study was conducted in one of selected potential beekeeping woreda of North Wollo zone, Meket woreda, from which one kebele was purposely selected.

Sampling techniques and sampling size

As the experimental procedure is considered, nine farmers owning strong honey bee colonies in Kenyan top bar hives were purposively selected and intensive training on splitting queen rearing technique, standard top bar nucleus hives and protecting clothes were given for participants.

Nucleus hives were cleaned and smoked with wax and aromatic plants traditionally known and found around the farmers. Then, the actual splitting of the mother honey bee colonies was undertaken at night using strong torch consecutively by coaching the farmers on checking the presence of eggs and day old larvae, which is potential queen and absence of mother queen during transferring into nucleus hives. The nucleus colonies splitted were put at 100 meter to one kilometer far from the mother colony to avoid the risk of reuniting. At 9th to 10th days after splitting, the nucleus hive colonies were checked whether they have constructed and sealed queen cells. Then, by leaving the best queen cell, others were harvested and destroyed to control swarming. In order to check the safety of honey bee colonies, internal and external inspection was carried out in both mother and daughter colonies. At 12th to 13th days after emerging, the queen was checked for starting to lay eggs and the colony was returned to the normal backyard apiary site. When the colonies in the nucleus hives become populous, they were transferred in to the standard Kenyan top bar hives.

Data collection and statistical analysis

The data collected from the demonstration were: number of hive multiplied, number queens developed/hive, number of nucleus colony produced from each parent hive, number of colony adapted after splitting, number of colony abscond after splitting, and farmers' and extension workers' view about splitting queen rearing technique. The collected data were systematically analyzed and interpreted using descriptive statistics SPSS 12.0 version software (2003).

Results and Discussion

Out of the 11 mother honey bee colonies splitted by nine beekeepers, all have given extra one daughter colony and one has given two daughter colonies. Out of the honey bee colonies that gave one daughter colony, 70% of them have adapted and 30% have absconded whereas from the mother colony that gave two daughter colonies, one daughter colony has adapted and the second has absconded. When the total number is considered, twelve daughter queens have been developed from eleven mother colonies. Out of these, 67% has adapted and 33% has absconded due to long lasted strong drought in the area

during experimental period (Table 1). The mean number of queens developed per hive was one and the mean number of nucleus colonies developed from parent hive was 1.09.

Table1. Number of honeybee colonies splitted, adapted and absconded.

	Number of mother colonies splitted	Number of daughter queens developed	Number of daughter colonies adapted	Number of daughter colonies abscond
Total	11	12	8	4
Mean per hive		1.09	67%	33%
Std. error of mean		0.091	0.141	0.152

After the completion of the experiment, field day was organized in Meket woreda at the experimental site kebele. During the field day, target beekeepers, other beekeepers, interested farmers, development agents from the woreda and socioeconomics and livestock researchers from Sirinka Agricultural Research Center have participated.

At the field day, farmers have reflected their opinion as splitting queen rearing has significant importance; they responded that while they have been living with honey bee colonies for long period, they wait intended wild natural swarm coming from abroad by hanging their traditional hive in the long forest trees or long trees around them which needs climbing force as well as gender issue and natural swarming from their hives to increase the existing honey bee colony stock as well to establish new apiary. The new technique has solved their long lasted problem of getting new honey bee colonies.

Continuing their opinion, in traditional bee keeping practice where new colonies are obtained by catching the swarmed colony during flowering period, much useful agricultural time for other farming activities such as weeding, harvesting, livestock keeping and others is wasted and is very tedious. The colony obtained by this method is also subjected to live in traditional hive which intern takes a lot of time to build combs and to become strong

colony. Similarly, this method of getting queen by catching the wild swarmed colony takes a long period of time to develop. As a result it is rare to harvest honey from the new colony at the same year of colony catching. But from the new method of queen rearing technique done by splitting either strong transitional or modern hive simply by taking the strong colony of the two hives (transitional or modern); containing seven to ten top bar or frames having a comb with egg, day old larvae and small amount of worker bees to cover the brood comb during the on set of flowering season. As the draw back, farmers have complained as the technique reduces the honey yield at the first year of splitting, however, they have convinced as they can compensate the loss by the produced colony which can be sold or is potential honey producer in the followingyear. It is also possible to get little honey at second cropping period of the year. In this new technology, one can decide for which purpose to use the colony (either for production of colony or honey). The advantage of the new queen rearing method is that the queen is reared by the will of the beekeeper not by the natural process of swarming and it also alleviates the problem of pinching the queen abdomen, and killing the queen and helps to produce queen free of damage.

According to the farmers' expression, the splitting queen rearing technique can be undertaken in both high honey production potential and less honey production potential areas. The beekeepers who live in less honey production potential areas can supplement their income by selling only honey bee colonies which costs more than six hundred ETB; whereas those beekeepers living in high honey production potential areas can benefit from selling both colony and honey. The follower beekeepers who are out of the target participant farmers have also splitted their colonies by constructing nucleus hive from locally available materials. This shows that the technique is accepted by the farmers and it is very easy to be adopted by beekeepers.

Conclusions and recommendations

The result of this study indicated feasibility of rearing queens by splitting the colony under farmers' condition. The work needs further scaling-up across different honeybee production potential areas of the region by using strong mother colonies during onset of flowering

season. The focus by the government should aim at creating marketing opportunity of honeybee colonies produced by the beekeepers using the technique.

References

Adebabay Kebede, Keralem Ejigu and Assaminew Tassew. 2007. Onfarm evaluation of colony splitting technique in Amhara region. In proceeding of the 2nd annual regional conference on completed livestock research activities, 14 to 16 September 2007. pp 64-70, Amhara agricultural research institute, Bahir Dar, Ethiopia.

Edwards, S. 1976. Some wild flowering plants of Ethiopia. Addis Ababa university press, Addis Ababa, Ethiopia.

EMA (Etiopian Mapping Agency). 1981. National atlas of Ethiopia. EMA, Addis Ababa, Ethiopia.

Kassye, A. 1990. (The honey bees Apis melifera of ethiopia). A morphographic study. MSc thesis, agricultural university of Norway, Norway.

Nuru Aadgaba and Dereje Wolteji. 1999. response of Ethiopian honey bee colonies to different queen rearing techniques. In proceeding of 7th Annual conference of Ethiopian society of animal production . 1999,pp 125-133, Addis Ababa, Ethiopia.

Nuru Aadgaba. 2007. Atlas of pollen grains of major honey bee flora of Ethiopia. Holleta bee research center, Holleta Ethiopia.

SPSS (Statistical package for social science). 2003. SPSS user's Guide 12.0, (SAS institute inc.)