



MANAGEMENT PRACTICES BEE PRODUCTION

MOHALE'S HOEK DISTRICT IN LESOTHO



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CONTENTS

1.1 INTRODUCTION	3
2.0 METHODOLOGY	4
2.1 DATA COLLECTION	4
2.2 AWARDING OF POINTS	4
2.3 CRITERIA USED FOR ASSESSMENT	4
2.4 VISITED FARMS	4
3.0 FINDINGS	5
3.1 CARE OF BEES.....	5
3.2 MARKETING OF PRODUCTS AND RECORDS KEEPING.....	9
3.3 TRAINING	9
3.4 OTHER SUPPORT SERVICE	9
4.0 DISCUSSIONS	9
4.1 CARE OF BEES.....	9
4.2 MARKETING AND RECORD KEEPING	11
4.3 TRAINING OR SKILLS IN APICULTURE MANAGEMENT.....	12
5.0 CONCLUSION AND RECOMMENDATIONS	12
5.1 SUCCESSES.....	12
5.2 CHALLENGES	12
5.3 CONCLUSION.....	12
5.4 RECOMMENDATIONS.....	12
6.0 REFERENCES	14



1.1 INTRODUCTION

Beekeeping, or apiculture, is the practice of managing honeybee colonies for farming purposes. Globally, it is estimated that animals are able to pollinate most of the flowering plants and the western honey bee is the main animal pollinator, playing a vital role in not only maintaining plant biodiversity but also sustaining the most critical agricultural productions. The most common species used in beekeeping are the western honeybee (*Apis mellifera*) and the eastern honeybee (*Apis cerana*).

Best management practice for bee are considered as a preventive tool able to control those factors that negatively affect honeybee health and have consequences for human health, the environment and farm productivity. There are many threats to honey bee health including parasites, pests, disease, pesticides, and inadequate nutrition Successful beekeeping means closely monitoring bee health and taking proactive steps to protect them.

The first and most critical step in responsible beekeeping is a lifelong commitment to education. All beekeepers should have a solid understanding of honey bee biology and basic beekeeping methods. They also need to remain current on issues of colony health and management and stay informed of recommended changes in beekeeping practices.

2.0 METHODOLOGY

Good beekeeping practices were compiled and classified by adopting World Organisation for Animal Health (OIE) and FAO guideline namely; guide to good farming practices for animal production and food safety putting more emphasis on one health approach; human health, animal health and ecosystem health.

2.1 Data Collection

Bee producing farms were visited and farmers were interviewed using face to face method with open ended and closed ended questions. Observations were also recorded on implementation of Best Management Practices (BMPs). The BMPs in apiculture were assessed using criteria below which were scored as follows:

2.2 Awarding of Points (Scoring)

- 1 Poor or Unacceptable Implementation of Best Practices
- 2 Average Implementation of Best Practices
- 3 Good Implementation of Best Practices

2.3 Criteria Used for Assessment

The following BMPs heading adopted from OIE–FAO with modifications were used as criteria to assess farmers' implementation of the practices and they include;

- General apiary management
- Disease management (general)
- Hygiene
- Animal feeding and watering
- Record keeping
- Training

2.4 Visited Farms

2.4.1 Mamorena Seqao

Mrs. Mamorena started apiculture in 2018 with one box collected from the wild. Her love for apiculture grew even further and increased her boxes steadily until 14 boxes.



Figure 1: Mrs Mamorena Seqao from Phatlalla Mekaling

2.4.2 Kelebone Matjobeng

Mr Kelebone Matjobeng is an elderly man farming apiculture in Holy Cross Mohale's Hoek. He is very enthusiastic and creative bee producer. Mr Matjobeng is very knowledgeable and confident about bee production. He started in 2007 with 4 hives from the neighbouring Republic of South Africa. He indicated that he had to make friendship with shepherds for identification of swamps in the wild. He managed to capture them but at the same time they were escaping the hive regularly until he learned about queen excluder technique which he uses to retain the swamp from the wild.



Figure 2: Mr Kelebone Matjobeng wearing bee production kit

2.4.3 Mpho Nqojane

Mr Nqojane started bee production in 2007. He started this work by constructing hives. He reported that he never collected any swarm of bees, all he did was to place empty hive and the bee brought themselves. His farm is situated on the outskirts of the village where the bees enjoy quietness.



Figure 3: Mr Nqojane

3.0 FINDINGS

3.1 Care of Bees

3.1.1 Placement of Bee hives and Bee Safety Signs

i. Bee Safety Signs

Mr Matjobeng farm had no warning signs about the presence of bees in the area but the community was made aware especially shepherds about the bees.

Mamorena informed her community through local chief about the presence of bees in the area in order to prevent accidents.

ii. Placement of Beehives

Sunlight

Mamorena Bee production site is well articulated with apiculture requirement because it is far from the busy traffic in a secluded area. The placement of the boxes is in such a way that they receive the first sunlight in the morning which is a prerequisite for placement. Mr Matjobeng hives are placed beneath a small hill facing the North West direction. The hilly area where hives are placed surely don't receive the first sunlight. Mr Nqojane and Mrs Seqao beehives get the first sunlight in the morning while some don't get it.



Figure 4: Mamorena beehive accessing early sunlight

Dappled Sunlight

Mamorena hives are placed under the trees and therefore the sunlight during the hot summers is filtered into partial shade so that hive is not too hot. Mr Matjobeng hive meets this criterion because of bushy plantation around the hive which provides some shade and reduce excessive heat to the hive.



Figure 5: Mr Nqojane Hives benefiting from dappled sunlight

Windbreak

The three farms beehives are protected from strong wind by windbreak plantation surrounding the hive even though some hives are not well protected.



Figure 6: Mr Matjobeng beehives surrounded by windbreak

3.1.2 Feeding and source of water

Mr Nqojane farm is very rich in floral species for feeding of bees. During winter the amount of flowering plants decline and Mr Nqojane is providing supplementary feeding resources by plant hairy vetch which he indicated that is mostly preferred by the bees. Mamorena indicated that her bees are well fed and

doesn't practice supplementary feeding but she however, highlighted that she offered them poor quality honey such as one contaminated by aloe because is not good quality. Mr Matjobeng planted a lot of flowery plants with yellow and purple flowers such as sunflower and Lucerne for foraging by bees. The farmer supported that at the beginning of summer months there is plenty of feeds for bees, which declined during winter time. He however, provides no supplementary feeding. The three farms provide ad-libitum water to the bees because two farms have dams while third one is situated near the stream with clean water.

3.1.3 Breeding

The three farms are using European Bee (*Apis mellifera*) for production. 'Mamorena farm is multiplying the hives through collection of swarm from the wild. Mr Matjobeng is very confident and knowledgeable about hive splitting and multiplication as well as formation of a new queen. He reported that he practiced this breeding programme during summer when there is plenty of food. Mr Nqojane reported he had never hunted for bees in the wild but bees brought themselves to his hives and he is also aspiring to receive training on queen breeding in order to increase the availability of bees in Lesotho.

3.1.4 Production and Productivity

Both Mr Matjobeng and Mrs Seqao have 14 active hives while Mr Nqojane is having four. The farmers are all producing honey, Propolis, wax, royal jelly and pollen. Mr Matjobeng reported that due to heavy rain, production was negatively affected and resulted with more pollen and Propolis than honey.



Figure 7: Mr Matjobeng bee products

'Mamorena bees are producing around 13kg of honey per each harvest. The farmer highlighted that she is harvesting twice per year. The harvesting process starts with smoking of the hive and followed by extraction of honey.



Nqojane farm is specializing with propolis production which he claimed it can be harvested every two weeks. He also pointed out that propolis is readily available throughout the year and is the most profitable bee product.

Figure 8: Mr Nqojane displaying some of bee products

3.1.5 Product Processing & Handling

Mamorena uses, honey extractor, steam and sieve to extract honey from honey combs. The honey is collected in food grade bucket passing through sieves to catches wax and impurities as honey is poured from extractor. Finally, the honey is stored in containers for marketing. She is also producing lip balm from royal jelly.



Figure 9: Mamorena Honey Extractor and bee products

Mr Matjobeng and Nqojane use double strainer sieves for processing and filtering of honey. Steam is also used to manipulate viscosity of honey. Farmers are also processing other by-products such as pollen capsules, soap, body lotions and lip balm.



Figure 10: Displaying Double Sieve Strainer for Honey Filtration

3.1.6 Diseases and Pests

The common disease and pests of bees reported by farmers include; ants, mites, beetles, birds and extreme cold temperatures. Mamorena reported that she successfully controlled the ants with cinnamon and ash concoctions. Mr Nqojane added that he raised the hives very high above the ground to reduce the attack by ants.

3.2 Marketing of Products and records keeping

Bee products are marketed using different marketing strategies such as face to face and use of social media platforms. Mr Nqojane and Mrs 'Mamorena products are sold far-a-fields such as Cape Town and Pretoria by promotion through social media. Mr Matjobeng products are sold locally where they are used in the control of allergies, common cold, and wax is used as Vaseline while honey is used as bread spread. The farmer stated that the products don't expire. All farmers attested that the business is profitable. With regards to records keeping all farmers keep their records that include sales and production records.

3.3 Training

All farmers visited indicated that they have received training on bee production and management offered by UNDP and other NGOs.

3.4 Other Support Service

3.4.1 Training & Extension

Farmers reported that extension services are available in the area and they are also supported by training sessions.



Figure 11: Mr Matjobeng accompanied by extension service during the visit

3.4.2 Financial Service

Farmers reported that they received some kind of funding in the form of hives from UNDP and other NGOs to start bee production. However, financial support in the form of loans and advances to develop business are not available.

4.0 DISCUSSIONS

4.1 Care of Bees

4.1.1 Placement of Beehives

Farmers did particularly well on apiary general management that covers placement of the beehive, its access to sunlight, provision of wind breaks. Beehives were well placed in the quiet secluded place with no noise and disturbance to the bees thus contributing to their welfare. Beehives were positioned in such a way that they receive early morning and afternoon sunshine. Bees must have a body temperature around 35°C to fly and they warm up to this temperature by

accessing sunlight. All the farms placed their beehives in the area protected by natural wind breaks such as shrubs and bushes that protects the hives from the strong winds. Windbreaks also protect the hive against cold winds during winter. By facing the hive southeast direction, also protects colony from the winter's wind chill. The installation of hives was also impressive because they were all placed on the stands that raised them above the ground and this is particularly important to protect the hives against water penetrating to the hive as well as protection from ants.

4.1.2 Feeding of bees

Feeding and water provision for bees was well implemented by farmers because their farms were placed in area full of floral plants and trees where bees forage on. Farmers also reported that they planted specific crops for bee such as sunflower and grazing vetch which are reportedly liked by the bees. A colony of bees requires about 250kg of honey and 35kg of pollen per annum. However, the issue of supplementary feeding during winter when feed is inadequate is not well adopted by farmers. Supplementary feeding is very important to guarantee high yields and quality honey. Mr Nqojane on the other hand highlighted that the bees like hairy vetch which he plants specifically for the bees during winter time. Water supply for bees was well articulated by all farms because all their farms were closer to a reliable source of water like a dam and stream. Water is very important because during hot summer days it is used for cooling the hive. However, bees prefer shallow water to avoid drowning and the farmer can provide water using shallow drinkers near the hives or use standard drinkers for poultry and add some stones where bee can land on.

4.1.3 Breeding

Bees breeding or multiplication is one of the important BMPs because it ensures sustainable production of bees by providing start-up bees for the new comers. The most common breeding method used by the farmers is swarming and colony splitting. Mr Matjobeng was vocal about bees breeding and pointed out that he is using both swarming and colony splitting methods to breed bees. One of the best practices recommended that queen should be replaced every one to two years to maintain functional and productive colonies. Replacing queens proactively will result in healthier colony populations and probably the reason why there are no disease reported by these farmers.

4.1.4 Production and Productivity

Best management practices are geared towards increased yields and sustainable production. Mrs. Seqao started with one box but she is now having 14 boxes in operation. Mr. Matjobeng started with four hives and he is now having fourteen. Mr. Nqojane reported that he had never collected any colony he just placed empty hives and swarm settle in and he is currently operating four hives. With good management it is clear that more and more boxes will come and the business will grow. The farmers are currently producing the following products; honey, propolis, royal jelly, beeswax, pollen and bee venom. These products are

high in demand because of their medicinal properties. Farmers also indicated that bees are very productive when considering the amount of products harvested.

4.1.5 Handling and Processing of Bee Products

The hygienic component was aligned with handling and processing of bee products by the farmers because some of the products are used as food for human consumption therefore, high level of hygiene is expected. Farmers are adhering to the standard and they are well aware that they should disinfect and sterilize their extracting equipment. During harvesting and extracting farmers are quiet aware that honey supers should not be placed on the ground and should not come in contact with dust during transportation. The processing of by-products also requires another set of hygienic standards such as use of clean and sterilized equipment, clean protective clothing and washing of hands regularly. Farmers are producing and packaging byproducts such as lip balm from royal jelly and pollen capsule from pollen. Propolis is processed into body lotions and creams. The farmers packaging style is up to commercial standards.

4.1.6 Pests and Diseases

Pest and disease control criteria was well attained by farmers because the main goal of the standard focus on how farmers protect their apiary against attacks. The important aspects of BMPs include promotion of sustainable production through proper care that reduces bee mortality. The majority of farmers reported that their major challenges are pest attack such as ants, mites, beetles and wax moth and they stipulated that they use mechanic control such as raising the beehives high above the ground. The use of homemade concoctions such cinnamon extracts and ash to control pests adheres to BMPs and sustainability. It is clear that the farmers are on the right track reducing the use of chemical control such as pesticides in the control of pest leading to a healthy environment. Mechanical and biological control of pests are considered ecosystem friendly. The use of windbreakers around the hives contributes significantly towards reduction of bee mortality due to extreme cold.

4.2 Marketing and Record Keeping

The products are sold locally in Lesotho and in the Republic of South Africa. Products are packaged and clearly labelled. The product promotions and advertising are done through social media platforms like WhatsApp and Facebook. The advertising of products had opened marketing outlets outside Lesotho to the neighboring Republic of South Africa. Farmers confirmed that advertising products is beneficial to their businesses by increasing their sales.

Record keeping standard was not as good as other standards. Farmers are keeping records covering issues such as number of hives, product yields and sales records. However, the standard requires more detailed records on each colony such as arrival date, inspection, disease outbreak and treatment, type of feeds used, movement of hives, swarms and harvesting of produce for each apiary. Proper

records keeping can enable farmer to keep track of hive's progress, record anything that seems unusual, notes to inform activities of next hive inspection, evaluate management styles and finally can provide information on the causal agent should the colony perish.

4.3 Training or skills in apiculture management

Apiculture is one of the highly specialized agriculture businesses that require proper training to acquaint one with the basic biology and management skills. All participating farmers have received training on the basics of bee keeping and biology. Farmers reported that they received training from UNDP and World Vision. Mohale's Hoek farmers are well trained and are extending their knowledge and skills to the newcomers that they are training. Farmers' efforts of training the newcomers will ensure sustainability because more farmers will be knowledgeable and improve bee productivity through good management practices.

5.0 CONCLUSION AND RECOMMENDATIONS

5.1 Successes

- Household needs are covered
- Payment of school fees for children
- Health benefits to the family
- Health benefits to the community and source of medication

5.2 Challenges

- Farmers lose colonies as a result of swarming
- Lack of inputs such as honey extracting equipment and weighing scales
- Honey contaminated with aloe
- Pests attack
- High bee mortality during cold weather
- Erratic market for bee products
- Lack of financial services to boost business
- Training needs on bee breeding techniques

5.3 Conclusion

Bee producers in the Mohale's Hoek district did very well in regard to implementation of best management practices. The average rating for the district stands at 82% against all the standard criteria assessed. However, the issues of records keeping, supplementary feeding, hive management and service delivery such as financial assistance and marketing channels for bee products should be improved.

5.4 Recommendations

1. Farmers need to improve on records keeping and hive management practices.

2. Ministry to continue offering training services in areas of breeding techniques and bee health aspects.
3. Ministry of Forestry and Land Reclamation to promote apiculture value chain to improve service delivery and marketing channels.
4. Farmer needed to improve their management or invite experts to diagnose their hive conditions.

6.0 REFERENCES

1. Harry Laidlaw and Robert Page (1997). **Queen Rearing and Breeding**. The “Bible” of queen rearing and breeding.
2. Lau, Pierre & Nieh, James. (2014). **Drinking dirty water: Why do honey bees (*Apis mellifera*) collect agricultural water and urban runoff?**
3. Melissa Caughey (2015) **8 Proper Beehive Placement Tips**
<https://www.keepingbackyardbees.com>
4. Smith JA, Flowers P, Larkin M. (2009) **Interpretative phenomenological analysis: theory, method and research**. SAGE, London
5. The Honey Bee Health Coalition (2019). **Best Management Practices for Hive Health**. A Guide for Beekeepers.
6. The Australian Honey Bee Industry Council (2007) **National Best Management Practice For Beekeeping**, In The Australian Environment
7. Vanessa Corby-Harris, et al. (2018) **Emerging Themes from the ESA Symposium Entitled “Pollinator Nutrition: Lessons from Bees at Individual to Landscape Levels,”** Bee World.
8. Xuan Luo, Yating Dong, Chen Gu, Xueli Zhang and Haile Ma (2021) **Processing Technologies for Bee Products: An Overview of Recent Developments and Perspectives**, Frontier Nutrition.
<https://doi.org/10.3389/fnut.2021.727181>
9. Zachary Huang (2010) **Honey Bee Nutrition**, American Bee Journal



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