



Food and Agriculture Organization  
of the United Nations



وزارة البيئة والمياه والزراعة  
Ministry of Environment Water & Agriculture



# Practical manual on organic beekeeping

BEE/051/2022/5

*Strengthening MoEWA's Capacity to implement its Sustainable Rural Agricultural Development  
Programme (2019-2025) (UTF/SAU/051/SAU)*

**Food and Agriculture Organization of the United Nations**

**Riyadh, Kingdom of Saudi Arabia**

## Contents

### Pages

1. Introduction .....	4
2. Definition and principles of organic production.....	5
2.1 Principles of organic production .....	5
3.1 Organic honey .....	6
4. Procedures to be followed in starting (conversion into) organic beekeeping.....	6
4.1 Selection of suitable apiary sites for organic beekeeping.....	6
4.2 Source/origin of bees, beehives, and other inputs to start organic beekeeping .....	6
4.3 Conversion Period .....	7
5. Procedures for operation of organic beekeeping .....	7
5.1 Feeds and feeding situation of bee colonies under organic beekeeping.....	7
5.2 Maintaining the health of bees under organic beekeeping .....	7
5.3 Management bee colonies and apiary under organic beekeeping.....	9
5.4 Migratory organic beekeeping.....	10
5.5 Record keeping.....	11
6. Procedures for postharvest handling of organic bee products .....	11
6.1 Harvesting and processing.....	11
6.2 Storage and transport.....	11
8. References .....	13

**Disclaimer**

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.

© FAO, 2021

## 1. Introduction

Today due to the increasing concern for our environment and increasing knowledge and public awareness on health issues, organic products become very popular. As a result of high demand and increased production, organic products became mainstream products. It is one of the fastest growing food sectors. Organic agriculture is a holistic approach that includes the whole value chain from the producer to the consumer and focuses on production of products naturally avoiding chemicals, genetically modified products, hormones, antibiotics, and any artificial inputs.

There is also a shift in the beekeeping world, from conventional beekeeping practices to organic beekeeping practices. In 2018 about 2.6 million beehives all over the world have been registered as organic (Pocol, *et al.*, 2021). The Kingdom of Saudi Arabia (KSA) aims to promote organic production, through supporting of smallholder farmers to convert their conventional farming practices into organic practices and to produce safe, high-quality food, while preserving the environment and natural resources. In KSA beekeeping is one of the potential sectors for organic production because it is largely practiced in valleys and rangelands away from agriculture farmlands where there is no or rare application of agrochemicals.

Since honey is a cash crop that is mainly produced for market purpose, it is very important to build consumer's trust. Building local honey consumers' trust, through introducing organic and ethical beekeeping practices are therefore very important pillars for the sustainability of beekeeping in the country. Moreover, organic honey has several relative advantages over conventional honey such as: increased marketability, easy traceability (due to the mandatory labelling and recording system), product quality assurance, and better price incentives. Locally produced organic honey fetches 15-30 percent (SAR 50-100) more money than conventionally produced local honeys. Moreover, once certification for organic beekeeping is obtained, the bee products other than honey (beeswax, bee collected pollen, propolis, royal jelly and others) can also be sold as organic products without requiring additional registration and certifications process.

Moreover, organic beekeeping practice contributes to positive attitudinal changes of beekeepers motivating them to follow good beekeeping practices and encourages integrative approaches with positive effects on the health of humans, honeybees, and environment that in turn contributes to long-term sustainability of beekeeping sector.

Since organic beekeeping is mostly started through conversion of the existing conventional beekeeping practices, the aim of this practical manual is to assist beekeepers in the process of converting to organic beekeeping and to demonstrate specific procedures and aspects of organic beekeeping. The document only covers aspects of beekeeping activities that differ from the conventional practice.

## **2. Definition and principles of organic production**

Codex Alimentarius Commission, of the United Nations (1999) define organic agriculture as “holistic production management system that avoids use of synthetic fertilizers and pesticides, minimizes pollution of air, soil and water, and optimizes the health and productivity of interdependent communities of soil life, plants, animals and people”. According to the definition, "organic agriculture enhances agro-ecosystem health, including biodiversity, biological cycles, and soil biological activity". It is based on minimizing the use of external inputs, avoiding the use of synthetic fertilizers and pesticides.

### **2.1 Principles of organic production**

According to the International Federation of Organic Agriculture Movement (IFOAM <https://www.ifoam.bio/why-organic/shaping-agriculture/four-principles-organic>), organic production focuses on four major principles: ecology, health, fairness and care. The principle of ecology is to attain ecological balance, that focuses on conserving the whole ecosystem, save environment from pollution, enhance biological diversity, rely on renewable resources, recycling, and reuse of inputs for better quality environment, promote the healthy use of soil, water, and air. In relation to beekeeping, suitable ecology is important because if the ecology is not suitable for beekeeping, skill, knowledge, and technologies do not make beekeeping successful. So, beekeepers in general and organic practitioners in particular should play a great role of ecological balances.

In relation to principles of health, organic farming focuses on production of products naturally, which is based on the principles of protecting the health of human beings and it encourages minimizing or total avoiding of use of chemicals/pesticides, genetically modified products, hormones, antibiotics and any artificial inputs that may have adverse health effects. In the principle of fairness, organic production supports, equity, respect and justice (benefit sharing) fairly to all groups (producers, processors, distributors, suppliers and consumers). In the principle of care: organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment.

## **3. General practices of organic beekeeping**

The general practices of organic beekeeping are similar to the ones of organic farming as such. However, the practices for organic beekeeping and honey production slightly differ from those for other organic livestock products. Further, organic beekeeping differs from the conventional beekeeping in that it needs to follow the specific procedures at different stages of honey production and processing to guarantee that the honey is produced organically.

### **3.1 Organic honey**

Organic honey refers to a honey that has been produced naturally, without the use and contamination of chemical substances in any stages of producing/processing/packaging. When we talk about organic product or organic honey it is not only that the honey itself is organic, but it also includes the principles or ethics followed taking into account the wellbeing of the whole ecosystem during the process of honey production.

## **4. Procedures to be followed in starting (conversion to) organic beekeeping**

### **4.1 Selection of suitable apiary sites for organic beekeeping**

- Bee colonies for organic beekeeping should be placed in areas where the sources of natural nectar, and pollen consist essentially of organically produced plants and/or wild vegetation and herbs,
- The selected apiary site should be at least 3 km away from other non-organic beekeeping apiary sites and also away from any chemical contaminant sources.
- Bee colonies should not be placed near to potential sources of contamination with prohibited substances, genetically modified plants and organisms or environmental contaminants.
- The respective organic certification official body or authority has to approve the selected area in order to ensure the appropriateness of the nectar and pollen sources for organic beekeeping.
- The official certification body or authority may designate a specific radius from the hive within which the bees have access to adequate and sufficient nutrition that meets the requirements,

### **4.2 Source/origin of bees, beehives, and other inputs to start organic beekeeping**

**Origin of bees:** Bees used or purchased for organic beekeeping must come from organic production units if available. If this is not possible, the bee colonies have to undergo a conversion period (one year) before organic certification can be claimed. In the selection of bee colonies, the ability of bees to adapt to the local conditions, their vitality and their resistance to disease should be considered. Under the current Saudi Arabia's conditions, only beekeeping with indigenous bee colonies (*Apis mellifera jemenitica*) is encouraged to be registered and certified for organic beekeeping.

**Beehives:** Beehives used for organic beekeeping should be made from natural materials (non-chemical treated timber), but you may also use corrugated or metal plates for the external hive covers. Each hive should have its own identity number,

**Beeswax:** For modern (box) hives, the new beeswax foundation sheets should be sourced from certified organic production units. In local beehives, the naturally secreted beeswax can be used as organic beeswax as long as the bees are kept under organic beekeeping conditions.

#### **4.3 Conversion Period**

Bee products can be labelled and sold as organic products, if the specific procedures presented here have been followed for a period of at least one year. During the conversion period the beeswax must be replaced by organically produced wax. Where no prohibited products have been previously used in the hive, replacement of wax may not be necessary.

### **5. Procedures for operation of organic beekeeping**

#### **5.1 Feeds and feeding situation of bee colonies under organic beekeeping**

- At the end of the production season (during honey harvesting) bee colonies must be left with sufficient reserves of honey and pollen to survive the dearth period without artificial feeding,
- However, the feeding of colonies is allowed to overcome temporary feed shortages due to climatic or other exceptional circumstances like disease outbreak,
- In such cases, if available organically produced honey or sugars must be used,
- If pollen or pollen substitutes or supplements are prepared and feed it must come from organic production,
- However, under certain circumstances, the certification body or authority may permit the use of non-organically produced honey or sugars. But the time-limits should be set for such exemptions,
- In such case feeding should be carried out only between the last honey harvest and 15 days before the start of the next nectar flow,
- The sugar provided should not exceed the requirements of the colony and should not be stored in the comb not to mix with natural nectar or honey,
- If any excess stored sugar remains in the hive, it must be removed before the start of nectar flow.

#### **5.2 Maintaining the health of bees under organic beekeeping**

In organic beekeeping the health of bee colonies should be maintained through applying good beekeeping practice, with emphasis on prevention measures which include:

- Use of well adapted indigenous bees to the local conditions,
- Use disease resistant bee breeds,

- Regular cleaning and disinfecting of equipment with approved organic disinfectants (Lactic acid, Oxalic acid, Acetic acid, Formic acid and others) or use of boiling water or flame to disinfect hives, frames and tools,
- Regular renewal of beeswax, (in each hive one third of the old combs should be replaced every year),
- Assuring the availability of sufficient pollen and honey to maintain the bee colonies,
- Diseased bee colonies have to be moved to isolated areas (about 3 km away from healthy colonies),
- Contaminated beehives and materials that cannot be decontaminated by the below described cleaning and sterilizing procedures need to be totally destroyed,
- Apply only natural products to treat honeybee diseases,
- Avoid veterinary medicines (antibiotics) and acaricides,
- Apply biomechanical means to minimize the effects of some honeybee diseases such as:
  - for varroa disease: interrupt the mites life cycle through minimizing or absence of honeybee brood in a colony either through removing the broods or temporarily confine the honeybee queen to limit her egg laying and subsequently not to have a brood period so that the varroa mites cannot complete their life cycle to reinfect the colony.
  - For chalkbrood, remove all infected combs and broods and replace with new foundation sheets.

**For honeybee diseases and pests control the following treatments are allowed:**

- Organic products such as: lactic, oxalic, acetic, formic acids can be used,
- Natural etheric oils such as: menthol, eucalyptol, camphor can be applied,
- Sterilization of infested hives and equipment should be done with steam and direct flame,

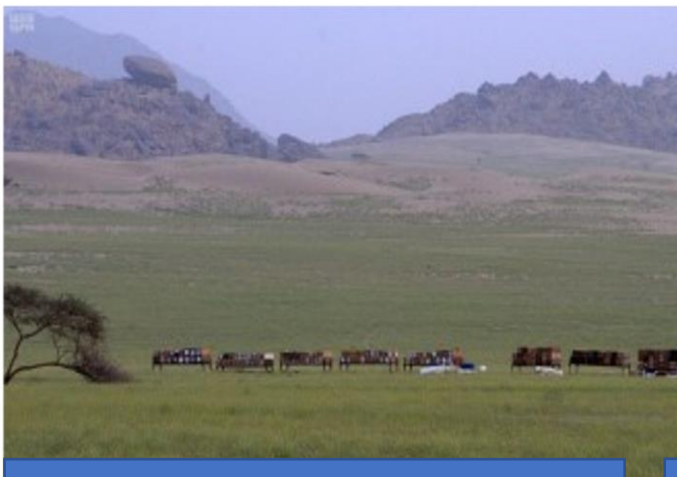
Where preventative measures fail, veterinary medicinal products may be used provided that:

- Preference is given first to phytotherapeutic and homeopathic treatment,
- If chemically synthesized medicinal products are used, the harvested bee products must not be sold as organic,
- After chemically synthesized medicinal treatment, the beeswax must be replaced completely with organic beeswax,
- Every veterinary treatment must be clearly documented and reported to certifying body.



### 5.3 Management bee colonies and apiary under organic beekeeping

- The bee colonies should be optimally managed to remain healthy and strong through accessing sufficient source of pollen and nectar,
- The bee colonies should access to sufficient and uncontaminated fresh water,
- The bee colonies should be protected from direct sunlight and heat either by keeping under natural trees shade or man-made shelters or covering the hive with sunlight reflecting materials,
- The killing of bees on the combs during harvesting of bee products is prohibited,
- Mutilations, such as clipping of the wings of queen bees are prohibited,
- During honey harvesting the use of synthetic chemical repellents is not allowed,
- Smoking should be kept to a minimum and materials used for smoking should be natural plant materials,
- During harvesting sufficient honey should be left to the colony to maintain itself up to the next nectar flow period,
- Apiary should be kept clean (as shown below, in Fig.1A),
- Do not discard plastics and wastes around apiary (Fig. 1B) and it should be managed following the principles of ecology,
- Beeswax must not be discarded Fig. 1C), and should be collected, melted and recycled (Fig D),
- Reuse of inputs by recycling of wastes for better quality of environment and optimum utilization of available resources are important principles of organic production.



A) Good apiary management



B) Bad apiary management



Fig. 1. Good and bad apiary management and good and bad practices in recycling old beeswax

#### 5.4 Migratory organic beekeeping

In the Kingdom of Saudi Arabia, where 75 percent (175 million hectares) of the land is rangeland with little or no application of agrochemicals, the opportunity for migratory organic beekeeping is very high. Organic beekeeping through migration of colonies is possible as far as the selected sites where colonies are moved comply with the requirements for organic beekeeping (see section 4.1). However, when colonies are moved, the organic certification body should be informed, to inspect the new site and management of colonies as required. If necessary, apiary tracking device (GPS) can be used to track the movement of colonies by organic certifiers.

Colonies to be migrated should be packed to:

- Secure the position various hive components (hive cover and frames) placed firmly,
- Avoid shaking frames and hives during transporting,
- Provide adequate ventilation to the bees,
- Prevent congestion inside the hive,
- Prevent honeybees escaping through gaps in entrance gates, and other hive components,
- Move the bee colonies during the night and at cool weather.

Also in migratory organic beekeeping, colonies should be kept at least 3 km away from non-organic beekeeping colonies, which is to avoid the bees accessing non-organic bee feeds used by non-organic beekeepers.

## **5.5 Record keeping**

- Each colony in organic beekeeping must have its own hive reference number,
- Total number of colonies and honey yield of each colony and total honey production should be recorded and reported,
- The operator should maintain detailed and up-to-date records about his organic production practices,

## **6. Procedures for postharvest handling of organic bee products**

### **6.1 Harvesting and processing**

- During honey harvesting the smoking material should be natural or from materials that meet the organic requirements,
- Bee repellents consisting of prohibited substances (chemical synthetic) must not be used,
- Excessive smoke shall not be used as it may taint the flavour of honey or otherwise spoil its aroma and tastes,
- Harvest only ripe honey without open and sealed brood,
- The place used for honey extraction shall be hygienic and free from insects (flies, ants and bees),
- During the extraction and processing of honey, the temperatures should be as low as possible (less than 40 °C),
- Honey extractors and filters must be food graded and suitable for organic beekeeping,
- Honey extractors and filters must be cleaned without chemical detergent or soap.

### **6.2 Storage and transport**

- Organic honey must be protected at all times from co-mingling with non-organic products,
- Honey shall be stored in food graded and air-tight containers,
- The honey shall be stored in a cold room away from direct sunlight,
- Organic honey must be protected at all times from contact with materials and substances not permitted for use in organic farming and handling.
- Stores for organic product should be separated from conventional product stores and clearly labelled,
- In case organic and non-organic honey are kept in the same store there must be proper labeling,
- Containers for transporting organic honey must be cleaned using methods and materials permitted in organic production,
- Measures should be taken to prevent possible contamination of organic bee products from any pesticide or other contaminants.

## **7. Organic certification**

Organic Certification: is a procedure by which officially recognized certification bodies, provide written or equivalent assurance that the product, process, or services or food control systems is conforms with certain organic standards. Any product to be labeled and sold as an organic product need to be certified by an officially authorized body. Even if the beekeeping practices comply with the requirements of organic production, consumers do not accept the claim ‘organic by default’ unless the authorized body certifies the honey and its production as “organic”..

Under KSA conditions, anyone who is interested in getting the certification for organic beekeeping must apply online under the Ministry of Environment, Water and Agriculture (MEWA) website dedicated for this purpose <https://naama.sa/Services/Details?EncryptedKey=1AGfILwLKFI%3D> . Under MEWA there is the Organic Production Department (OPD) responsible to promote the development of organic production. The department has branch offices and focal persons in all regions of the country to assist anyone interested to register for organic production. In the case of beekeeping one of the important requirements to register for organic beekeeping is to have a valid license for beekeeping.

Once the beekeeper has applied online, the application will be reviewed by the concerned OPD expert, and a private (authorized) organic certifying body will be informed to make the necessary regular inspection and auditing.

Detailed procedures and requirements for organic certification will be provided to the applicant by the organic certifying body and also by OPD as soon as registration starts. The fees for regular inspection and certification will be covered by the applicant. Once the applicant obtained the organic certificate, he/she can claim a compensation from the MEWA. MEWA, has allocated a lump-sum compensation depending on the number of colonies certified for organic beekeeping.

## 8. References

Codex Alimentarius, GL 32-1999, (Adopted 1999, Revisions 2001, 2003, 2004 and 2007. Amendments 2008 and 2009) Guidelines for the production, processing, labelling and marketing of organically produced foods.

[https://www.ipcinfo.org/fileadmin/user\\_upload/livestockgov/documents/cxg\\_032e.pdf](https://www.ipcinfo.org/fileadmin/user_upload/livestockgov/documents/cxg_032e.pdf)

Codex, 2001 Guidelines for the Production, Processing, Labelling and Marketing of Organically Produced Foods, sections concerning livestock and livestock products and bee-keeping and bee products, <https://www.fao.org/3/Y2772E/y2772e0b.htm#bm11.2>

Citation: Pocol, C.B.; Šedík, P.; Brum ̃a, I.S.; Amuza, A.; Chirsanova, A. Organic Beekeeping Practices in Romania: Status and Perspectives towards a Sustainable Development. *Agriculture* 2021, 11, 281.

<https://doi.org/10.3390/agriculture11040281>

International Federation of Organic Agriculture movement (IFOAM) Four principles of organic agriculture, <https://www.ifoam.bio/why-organic/shaping-agriculture/four-principles-organic>  
Accessed November 2021



برنامج التعاون الفني بين وزارة البيئة والمياه والزراعة ومنظمة الأغذية  
والزراعة للأمم المتحدة، الرياض، المملكة العربية السعودية  
ص. ب.: 558 الرياض 11421  
بريد إلكتروني: [FAO-SA@fao.org](mailto:FAO-SA@fao.org)