Successful Beekeeping A-B-C's

By Terry Martyn Jr.

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Recommended Resources

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About the Author

I will always be grateful to my grandfather who let me help him with his bee hives and about the productive and puzzling creatures inside them.

I wrote this book to answer your questions and encourage you, like many other people I've talked to, to become new bee keepers.

I've tried to cover as many aspects as I could without loading you down too much with theory or opinion.

I also hope that that you will use it as a reference and for motivation from when you first set up a hive to the time, not too far away, when you start sharing your knowledge and enthusiasm with other would-be apiarists.

Then, you might agree with me that the benefits are much more than just honey and money!

Terry Martyn Jr.

Benefits of Beekeeping

Pollination

Pollination: Bees are active pollinators. Most plants require effective pollination for their survival. Bees are the most preferred pollinating insects. Extensive and proper pollination can bring about larger harvests of fruits, vegetables, and crops. Having bees nearby can bring a marked improvement in the quality and quantity of vegetables, fruits, or flowers you and your neighbors grow.

Research shows that the dollar value of pollination by domesticated bees and beekeepers to a range of agricultural crops in the U.S.A. alone is measured in the millions of dollars per year.

Stress Reliever

Although there may not be any specific scientific claims to prove it, yet, beekeepers feel bees help them reduce their personal stress levels. Visitors enjoy just watching the bees coming in and going out of their hives with all their hustle and bustle.

Educational

Beekeeping is very educational for adults and children. You can learn many things from watching bees as they follow specific patterns of work.

Different categories of bees have assigned duties. Keeping a regular watch on beehives, observing bees, drones, and worker bees going about their work can teach us valuable lessons on work and time management.

Gifts

Beekeeping helps you to be able to shower your friends and relatives with various exclusive gifts at a fairly low cost. Gift items from your beehives could include bottled honey, beeswax, cosmetics, homemade candles and even lip balm.

Healthy Products

You can use the bee products available from your bee colonies to

maintain your health. A regular supply of fresh, pure honey collected from your own beehive is just the start.

Many people believe that propolis (a glue produced and used by bees to maintain their combs) is good for you.

First Steps

Before you order or build your first hive and invite any bees to move in, check that you have the space, time, money and other resources necessary for your new hobby.

I will share the knowledge I've gathered about every aspect of beekeeping but much will depend on your personal circumstances and other commitments, local regulations and your neighbors.

Cost

You need enough money to set up your hives, gather the equipment needed and buy your bees long before you will see any return at all from the first couple of hives.

You can sometimes get used equipment at a lower cost but you must be careful that every precaution has been taken to ensure that it does not carry any defects or residue of any disease which could affect your bees.

The best advice is to buy new equipment and to pay a bit extra for better quality gear that you can be confident will require minimum maintenance and last longer.

You need to work out for yourself what it is worth to you to reduce the time and stress that can result from buying out of the bargain bin, especially when you are still learning your way around.

Space

You need enough space to locate each hive with at least a few feet clear of obstructions. You should allow at least three feet between hives.

You also need easy access to the area where you put your hives. You will need to remove, repair or replace parts of the hive, bring in your equipment and take out the honey and other produce as well as damaged hive sections.

Keep some distance between the hives and any public paths or roads. This reduces the chance of bees upsetting passers-by or the public interfering with your bees.

Planting a hedge or placing some fencing about 6 feet high between the hives and any public area will reduce the possibility of conflict. It's no problem for the bees which are naturally inclined to circle upward as they leave the hive so that they can map their surroundings for the return journey when they will, usually, be carrying a valuable load.

Food, Water etc.

Bees can travel miles to get the food they need but the shorter the distance they need to cover, the less risk that they do not return and the greater chance of a bumper harvest from happier, stronger bees.

A reliable, year-round source of water is also essential. It should not be something like a pool or a bucket under a dribbling tap which the bees would have to share with other creatures, human or animal.

The water should be at least a few feet from the hive so that the bees can relieve themselves on the way. Bees do not foul their hives and you don't want them fouling their water supply.

Make sure that there is something, like twigs or small pieces of plastic foam, floating in the water where they can stand while they drink. Bees don't swim – they can drown!

Pets and Other Domestic Creatures

My cat has never had a problem with my bees and most cats will probably be too smart to get stung.

Dogs, generally, are more inquisitive, even aggressive and there is probably more risk of a painful confrontation. Keep the dog away from the area where the bees are travelling and drinking or make sure it is closely supervised by an adult or responsible older child.

Larger animals, like cattle and horses, are more likely to harm your bees and the hive than suffer any major damage themselves. Don't risk it!

Wild Animals

From bugs to mice and on up to bears, they're all likely to have a negative effect on your bees and your returns. Keep them away by whatever legal means you can.

Avoid poison, if for no other reason than it could hurt you, your honey and your bees as well.

Climate

Bees can live almost anywhere where there is enough vegetation to provide the raw materials for their comb building and honey production.

But, you should avoid intense sunlight or dark areas where they would have to work too hard to moderate the temperature inside the hive.

Under a shady tree might be a good location but keep a reasonable distance from the tree trunk and branches.

If your area gets frost or snow, you will need to protect the hives during the cold months. You might wrap the hives while leaving the entrance area clear.

You will also have to ensure that there is no snow or condensation inside the top of the hive. As the frost melts, the cold water could drop on and kill your bees. That could have a serious effect on the health and productivity of the hives.

Don't put the entrance in the path of the prevailing wind.

Hilltops and the bottom of depressions expose your hives to cold weather and the risk of damp seriously affecting the internal parts of the hive and, of course, the health of the whole colony.

If the hive receives sunlight early in the morning, that encourages the bees to start their work sooner.

Rules and Regulations

Before you start beekeeping, you must check all county or district restrictions. Some counties require beekeepers to register apiary locations with the county agricultural commissioner during January or whenever you get new bees.

You need to pay appropriate fees.

Neighbors

You should also consider any possible allergic reactions to your family or neighbors due to beekeeping. Consider possible oppositions before you start beekeeping.

Much of the opposition which I've heard about has been fuelled by media reports of "killer bees" which are mostly hype.

But, there are a small number of people who can have a serious reaction to even one bee sting.

The other downside of bees is their droppings can damage a car's exterior and, of course, put spots on the vehicle. This is not usually a major factor – birds drop more mess and nobody bans them.

You can also reduce the possibility by putting fencing or tall plants, about six feet high, a few feet in front of the hive entrance to encourage the foragers to fly higher soon after leaving the hive and to stay high on their return flights.

Watch and Learn from the Bees

The most important lessons that you will learn will come from your bees. So, be prepared to spend a reasonable amount of time in their company.

An important factor in your eventual success is the gradual development of your understanding or intuition about how your particular bees are doing.

We must use all our senses when we are near the hives. Sometimes, it might just be an out of the ordinary smell or sound which is the signal that something is wrong and we need to take some sort of action.

For instance, your bees may be rushing around the hive entrance. This is common when the foragers are starting out in the morning or when a bee has returned to the hive and alerted the other workers of a new, rich source of food for the colony.

But, the current commotion may be the result of an attempted invasion by aggressive bees from another hive!

You can see how important it is that you learn as quickly as possible how to know what event you are watching and what action, if any, you need to take.

Join Your Local Beekeeping Group

Membership of your local group of beekeepers can also be invaluable.

One of the greatest assets for a new beekeeper is the knowledge and active support of more experienced people in your area.

However, it is a common complaint that, "When you get three beekeepers together, you are sure to hear at least four theories of the best way to keep bees!"

The first lesson is that we should never stop listening and learning.

You will only know how good the advice you are given is when you put some of it into practice. Beekeeping, after all, is a hobby with more than 1000 years of history behind it. We still have a great deal to learn and it is even possible that we have forgotten some important points about proper hive management.

Some say that our hobby is as much an art as a science.

If we stop listening, learning and evaluating ideas and practices that are new to us, we reduce the potential benefits that we may gain from our beekeeping.

Just because an idea is new or has been successful for another beekeeper, does not mean that you should blindly follow these suggestions and rush to change your current method, especially if it has been successful for you up until now!

Your own ideas will change to some extent as you get more experience around your hives.

The more experienced members can not only provide information which will speed your learning process, some may let you watch them do the various tasks, like inspecting hives and frames, preparing and using a smoker etc.

You could also help the other members by volunteering to help them with some of the physical work and gain some valuable experience for yourself.

Many clubs offer classes where you can learn some of the practical aspects of your new hobby. Don't be afraid to ask questions about any part which is not clear to you.

From my own experience, I know that many people hold back because they don't want to exhibit their lack of knowledge in front of the other people. But, this can seriously delay your development as a successful beekeeper.

You may also be helping other inexperienced people who are also having trouble with that particular aspect but hesitate about asking questions.

In fact, it's a good idea to seek out other beginners in the group and have your own discussions and provide support to each other when needed.

Don't worry if some of the group seem to progress much faster than you feel you are doing. The important thing is to learn the basics thoroughly, but do it at a pace which you personally are comfortable with.

Support the Group

Try to give back something for the value you get, not just by paying your annual subscription and turning up for meetings. Every club of whatever kind needs more members who will invest some of their time and energy to help the club with the smooth running of projects and the regular meetings.

Almost every club, not just beekeepers, usually has too many drones.

Many members will notice your willingness to give back. Some may try to take advantage but it will also encourage more members to share their experience with you.

Types of Bees

There are many varieties of bees.

The most common domesticated bee is the ***Apis mellifera***.

I suggest you start with the “Italian” species which has earned a reputation for their usually peaceful attitude, production and general good health.

Discuss this with other keepers in your local area before making a decision. There may be reasons based on local conditions which have the majority selecting another species. But, make sure this is not something which only one particular beekeeper is fixed upon.

Queens, Workers and Drones.

All bee colonies have three categories of bees; the queen bee, female worker bees and male drones.

Queen Bee

A single egg is laid in a single cell of a wax honeycomb. Worker bees produce royal jelly to feed larvae. All larvae are fed royal jelly initially. Later, a single larva is fed only royal jelly while others are fed pollen and honey. This single larva undergoes several moltings and then spins a cocoon within the cell before pupating.

This larva grows into the queen bee.

The Queen bee is the largest bee and the only breeding female in the colony.

The Queen bee is raised from a normal egg but, after selection to be the new queen, the workers continue to feed her Royal Jelly instead of the pollen the other immature bees get.

She has a longer body than the others but has short wings. She may be lighter or darker than other bees in the colony. Since she cannot take care of herself, she has many attendant bees to feed her, follow her, groom her, and carry away her waste. The queen bee has an unbarbed stinger. She rarely stings beekeepers. Her sting is used for stinging other queens. She can sting any number of times.

Normally, there is only a single mated adult queen within a hive. Sometimes, there could be a mother and daughter queen within a single hive.

The success of your bee colony depends on the quality of the queen bee. You can purchase queen bees from commercial beekeepers or raise a queen to continue with the same strain and maintain a successful bee colony.

The Queen bee's job is to lay eggs. She usually lays more than 1,000 eggs each day. Her life span may extend from two to eight years.

Virgin queens go on mating flights away from their home. The queen mates with multiple drones. The mated queen will establish a new colony with a large contingent of worker bees. The nest or hive is scouted and prepared beforehand by worker bees. Then, the queen starts to lay eggs to produce her new brood.

A queen which mated in flight with many bees may bring back less desirable characteristics which will start to show in the new brood.

So, you may sometimes decide to introduce a new queen from your supplier who provides quality stock.

Introducing a New Queen Bee

Queen bee introduction is important as it can change the quality of the bee colony. Most colonies should be re-queened every two years, more often if the current queen is not producing well.

Get a young mated queen from a bee breeder with six to twelve attendant bees and supply of queen-cage candy for food.

This queen will be marked so that you can easily identify it.

Before re-queening, kill the old queen and crush any queen cells with a hive tool. Place the new caged queen within two hours. Remove the cover from the hole in the queen cage to expose the candy plug.

Shake bees off the comb of the emerging brood ready for a new queen. Place the queen beneath the cage and press the cage at least 1/8 inch into the comb. Replace the comb in to the brood nest and leave the hive alone for a week. The queen will be released when the bees eat the queen cage candy.

Drones

Drones are male bees. These hatch from unfertilized eggs. There are around a few hundred of drones in a hive and they live for about six to eight weeks. They do not have a stinger. They have bigger eyes than the queen or worker bees. The only function of the

drones is to mate with a queen. Drones can detect virgin queens on their nuptial flight and go to mate.

Drones left at the end of the season are considered useless and are driven out of the hive before the onset of winter to die. The main reason for this is to conserve the limited food stores for the more productive members of the colony.

Worker Bees

Worker bees are sterile females. There could be around 30 to 50 thousand female worker bees in a colony. Worker bees born in spring usually live for six weeks while those born later will live until the next spring.

They are about 12 mm long and do all the work. They have a pollen basket on each hind leg where they put the food they bring back to the hive, four pairs of special glands to secrete beeswax underneath their abdomen, an extra stomach for storing and transporting nectar or honey, and a straight barbed stinger for single use only. Because of the barb, the stinger rips open their abdomen when they sting someone and the bee dies.

Worker bees do all tasks essential to maintain a hive.

When young, these bees are called house bees. They attend to all work in their hive:

- building honeycombs
- rearing the brood
- protecting the hive
- maintaining optimum temperature within the hive by rapidly beating their wings
- keeping the hive clean, and
- tending to the queen bee.

The older worker bees are called field bees. They search and collect the nectar, sticky plant resins (which they make into propolis – bee glue) and pollen.

Producing Queens, Drones and Workers

Producing Queens

Drones mate with virgin queen bees in flight. If the mating drones are of poor quality, bees produced will also be of poor quality. Some beehives produce drones only.

A queen bee can produce fertilized and unfertilized eggs. The unfertilized egg is haploid and produces a drone male bee which carries a similar genetic set-up to its mother, the queen bee. It also carries a few strains of the genetic build-up of the queen bee's father. A drone bee does not have any father of its own as it comes from an unfertilized egg.

If the queen bee is not well mated, the drones it produces could be of different strains because the queen bee will pass on genes from her mother and father into the drones she lays.

Producing Worker Bees

If a hive for any reason is queen-less for more than twenty-four hours, workers bees would try to raise a queen from the queen cells. If there are no queen cells, these worker bees will start laying eggs. These will take around four to six weeks to mature.

Workers are female bees, but they produce unfertilized eggs as they have undeveloped ovaries. Normally, pheromones from the queen and brood inhibit the development of the workers' ovaries.

By the time the worker bees start laying eggs, the colony population could have reduced drastically as there is no queen to lay eggs and increase the brood.

It is almost impossible to replace a laying worker with a newly introduced queen.

You can try to rescue the colony by replacing the hive body, bottom board and four frames of bees and brood. Also include some frames with honey.

Then, introduce a new queen.

Check the hive after several days to see if the queen has been released and accepted.

If all is well, the new queen will raise a substantial brood and you will have a brimming and growing beehive with lots of activity going on.

Essential Equipment

Bee Hives

Early beekeepers harvested honey from wherever bees set up their colonies.

Some other early, man-made hives looked like inverted baskets and did not have any way for the keeper to examine the interior or remove the honey unless he destroyed the hive and killed or removed the bees.

These beehives provided only an outer enclosure without any formal structure within. Bees filled the insides with honeycombs. Honey extraction in traditional beehives required crushing of the wax honeycomb to squeeze out the honey. These hives thereby produced more beeswax than honey. It was not possible to remove honeycombs without destroying hives. Later adaptations of traditional beehives housed removable extra top baskets. These could be removed once bees filled them with honey.

Other traditional types of beehives included:

Tile hives: Clay tubes were used to form beehives in the Middle East, ancient Egypt, Italy and Greece. Long cylinders of baked clay were used singly or stacked in rows. Keepers smoked at one end to drive out bees during honey harvesting.

Skeps: These baskets were made of coils of grass or straw with a single entrance. The bees built the inside themselves. Honey extraction required killing of bees and squeezing of Skeps. These are no longer in use.

Bee gums: Sections of hollow trees like red gum were used to house bees. These were set upright in apiaries and sometimes had crossed sticks to provide cover or attachment for honeycomb. Honey harvesting destroyed bee colonies.

Petro Prokopovych invented the first artificial beehive in 1814 in the Ukraine.

Modern Hives

Most wooden beehives are made of pine or cedar wood. Cedar is preferred. The natural oils in cedar may improve the life of the beehive

When deciding whether to buy a readymade beehive or build one from a kit, consider the weight and the freight. Most kits come with adequate instructions and you may be able to draw on the experience, good and bad, of other club members.

An empty box might weigh around four to five pounds. It will weigh close to a hundred pounds when the frames are full of honey.

Enthusiastic beekeepers have developed many designs and variations which they believe better suit their own requirements and local conditions. They include

WBC: Designed by William Carr, an amateur beekeeper early in the 20th Century, this traditional design is very pleasing to the eye with a peaked roof and sloping boards on the sides. It was designed to better protect the hive and its contents from wet and cold weather. The working hive is housed in a set of thinner walls inside the outer sloping panels.

It is not as easy to manage as designs like the Langstroth because the outer walls have to be removed so that you can work on the productive sections. This double-wall construction adds to the size and weight while providing a smaller area for production of honey than other designs.

It is still widely used. Some people like the appearance despite its lower productivity and the outer walls allow the inner sections to be lighter and easier to handle.

Top bar hives are found in Africa and Asia and used for programs like 'Bees for Development' because they are relatively simple to produce and can often be made from local materials. These hives do not have frames.

These have movable frames with only a top bar. Bees build comb so that it hangs down from top bar. This top-bar design is a single and longer box with all frames hanging in parallel. Bees have to rebuild the comb after each harvest.

It is easy to interact with hives and lifting honeycombs is simpler and much lighter. You do not replace the honeycomb of top bar hives back into the hive after extraction. Honey production in such hives is just 20% of that of a Langstroth hive.

Langstroth: In the mid 1800's, a Rev. Langstroth designed the hive which bears his name and is still among the most widely used hives today. It's the type which I'll focus on in this book.

The hive parts are of standardized sizes and removable frames allow for easy removal and replacement without harming the bees. The Langstroth design has a number of wooden sections that hold the removable frames on which bees construct the combs where they place their eggs and honey.

The removable top gives easy access for the keeper to inspect and maintain the interior sections as well as fix any problems and remove the vertical frames when it is time to harvest.

Rev. Langstroth also set the standard gap between the vertical frames (3/8”) which allows the bees to move about but is not so wide that they clutter it with bee glue (propolis) or burr comb (extra pieces of wax comb which bees build between the wax in two separate frames).

Managing Hives

Proper bee management ensures healthy beekeeping. You should inspect your beehives every fortnight to make sure the queen is laying eggs, there is sufficient room, the bees are disease-free, and honey storage is going smooth. Record all your observations in a diary for later reference.

It's nice to see that you are getting better results but it can also help alert you to any potential problems.

Parts of a Hive

Most modern bee hives have parts which have the same names and function of other designs. This section is an overview which focuses on the functional pieces common to most hives. The names given to the various pieces may vary with different designs and in different locations. There are many hybrid designs which individual beekeepers of groups have developed to better suit their particular needs.

Stand: Most beehives have a stand or are placed on a bench or table which serves the same function; keeping them off the ground, clear of vegetation and at a height which is more comfortable for the beekeeper to work on the hive.

The bottom of the hive should not be too far off the ground because you will find it more difficult to work on the upper sections after you have added one more supers to a productive hive. About 30 inches is probably a good height.

The stand or bench will need to support the weight of the honey-laden hive which could be as much as 150 pounds.

Floor: This is a sheet of wood which protects the hive from predators and reduces the effects of the weather.

Entrance adjuster: With some designs, a slide is incorporated which can be adjusted to allow several bees or just one to enter or exit the hive at the time. Other designs have a separate wooden bar with small and large slots in two adjacent surfaces which performs the same function.

Mouse excluder: A further step to protecting your hives where there is a risk that mice might try to enter them, is to add a metal strip which has a number of holes in it that permit bees to enter but will block rodents.

Varroa screen: This is a metal screen in a wooden frame which is set below the brood and honey frames. It is a safe and surprisingly effective way of reducing the effects of the Varroa mite which is becoming one of the most prevalent threats in beekeeping.

It was discovered that many of the mites fall off their bee hosts and onto the hive floor, but are able to crawl back up to where they can get on to the bees again. The Varroa screen stops them from climbing up and re-infesting the bees because they fall through the screen and die through lack of food.

Some keepers use a sticky board between the screen and the hive bottom board so that they can check how many mites drop through. This gives them a better idea about the level of infestation.

Frame boxes: These are the four sided, bottomless and topless boxes which protect and support the frames on which the bees build the comb in which they put their eggs or honey.

The lowest frame box is called the brood box. This is where the colony conducts their lives; the brood is raised, the queen lays her eggs, the honey needed by the bees for their own use is stored and bees regulate the temperature within the hive by beating their wings.

The other frame boxes are sometimes called “supers” because they are used for the thinner “super” frames where the bees put the honey which you can harvest at the appropriate time.

Frames: These four sided inserts are usually made of wood though some keepers use ones made of plastic.

Plastic frames do not suffer damage by wax moths as much, and don’t need assembly or painting. But direct sunlight may warp them and they aren’t as easy to sterilize before re-use.

The frames contain a sheet of foundation (usually made of wax) with a grooved pattern of hexagons impressed on it. This pattern guides the bees which build the walls of their wax cells outward from the grooves.

Plastic foundation sheets are becoming available but some keepers report they are less attractive to their bees. Maybe the producers will impregnate them with the smell of natural wax or find some other way to overcome this.

Shallow frames are used in the upper boxes where the bees put their honey. Deeper frames are used in the lowest box which is where the queen lays the eggs and the brood is raised.

The frames often have a wire support woven through them.

Super frames with no wire support are usually used when the honey is being produced and supplied in its natural comb.

Queen excluder: A perforated plastic or metal screen which is placed between the brood box and the upper boxes where the bees will store the honey. This prevents the queen, which is larger than the worker bees, from travelling into the upper boxes and laying eggs there.

If the queen is able to lay eggs in these frames, the workers will bring pollen there to feed the brood and the honey from that area will be cloudy and of lower value.

Crown Board: This is the cover over the top super which helps to protect the hive from the weather. The board has a hole in the center through which you can feed the bees without removing the board.

It's usually made of wood but clear plastic Crown boards are used when the keeper wants to be able to watch the activity below with minimum disturbance of the bees.

The plastic type should be replaced by a wooden Crown board for better weather resistance during the winter.

Roof: This is usually wood with a sheet of thin metal over it for strength. Ventilation holes are provided. The Langstroth and most other hives, except the WBC, have flat roofs but some keepers use sloping roofs to add more eye-appeal to their hives.

Clothing

From the start, you need to accept that you will get some bee stings.

Stings on the face and neck are very painful and may cause more swelling than on other parts of your body.

Protective clothing is essential for the beekeeper and also for family members or other people who visit your hives, to reduce the number and severity of those stings and the number of bees that die stinging you.

A full protective suit is the ideal and there is some price competition between suppliers.

If you don't want to invest in a full outfit when you start, you can get separate items which will keep your initial costs down.

The minimum I can recommend is a combined hat and veil and gloves. A veil will protect your face.

Gloves will help to protect you from bee stings and prevent bees from crawling inside your sleeves. But, many experienced beekeepers prefer not to use gloves as these restrict the delicate handling required.

Jackets and other items are available.

All your clothing should be light-colored and comfortable. Dark clothing is said to encourage more attacks from bees,

You must ensure that you fully seal all gaps between the protective gear and your other clothing or bees will make you very uncomfortable. Don't forget to completely cover the area around your ankles so that bees cannot climb up your legs or sting your ankles – stings in those areas are very painful.

You can buy special straps or just tuck everything in securely.

The Tools

Every hobby or business has its own specialized equipment. I will just describe the most common tools here. As your experience grows, you will be better able to decide if you need some new “improved” implement or you can save your money and stick with these proven devices.

Keep all your tools together in a suitable, portable container.

When you get to the hive try to make as little noise as possible when putting down the container and the separate tools. Bees are sensitive to vibration and you want to keep them as calm as possible.

Hive Tool

This is an essential tool with a variety of uses. Some keepers even use the edge to lift out bee stings if their fingernails are too short!

Many beekeepers have developed their own variations and several have been popular enough to be manufactured commercially.

This is the best tool to lever apart the sections of the hive. There is more chance of damage if you use a large screwdriver or other tool which is not designed for the task.

Bee Brush

This is used to brush bees from your clothing or from yourself.

The Smoker

When you open a hive, the guard bees go into defensive mode and release a special pheromone to warn other bees of the intrusion.

Beekeepers use a smoker which creates smoke from incomplete combustion of various fuels. The smoke is believed to mask the alarm pheromones released by guard bees and also makes the bees think fire is approaching. The bees start gorging themselves, getting ready to abandon the hive.

This makes it easy for you to open the hive and work without any defensive reactions by bees.

When you finish your inspection, provided you do it in a calm manner and don’t take too long, they will settle back into their routine. But, each inspection will have some effect on production.

Your smoker will not be useful for a swarm, because swarms do not have honey stores to feed on. Also, swarms are less defensive so your smoker is not usually needed when gathering a swarm.

This device has a bellows, metal combustion chamber where you burn the material which produces the smoke, and a spout which you use to direct the smoke to the area where you want it.

It needs some practice to ensure that you use it appropriately – too much smoke or heat can upset the bees instead of just encouraging them to move away from the frame which you want to handle. Upset bees sting!

Grass cuttings, wood shavings, rolled cardboard and hessian can be used to smoulder rather than burn and just produce smoke rather than flame.

Ensure that none of the materials have any substances in them which may harm the bees. Some cardboard materials may have poisonous paint or fire-retardant chemicals on it. The grass and wood shavings may have been treated or sprayed with poisons of some kind.

Apply a puff to the area which you want to clear and the bees will usually retreat in a few minutes to other supers to start collecting their honey before fleeing from the fire they think is approaching. They will not actually leave if you minimize the time your need to do your work and then let them settle back into their routine.

There is a water-based product called Liquid Smoke which is sprayed on bees from a plastic spray bottle. It is claimed to be a cheaper, safer and more convenient alternative but I have not used it. Once you learn to use a smoker, you can decide for yourself.

Getting Your Bees

You can get bees for your beehive from different sources like a package, swarm, a small nuclease hive, or a complete hive. It is best to obtain bees only after acquiring all essential hive equipment and setup. Beginners should acquire bees from nuclease hive or package bees.

Getting your bee stock from your club or a local breeder is the best option because it is likely to be cheaper, but the main reason is that this means less stress on the bees.

If you are getting your stock from a club, they will not wait long for you to collect them because that could cause trauma to the bees and there are always more wanting bees than they can supply.

Another advantage is that you will be able to get advice from the local supplier more quickly and it will take into account the local conditions you will raise your bees in.

Avoid suppliers, however low-cost or well-intentioned, that do not have a history of providing good stock.

Many amateur beekeepers start to offer nucs and packages after just a couple of seasons experience and they don’t always deliver the quality product or support that you need.

You will need to order your bees months before the delivery date. Orders are sent by the order date received method.

Nuc's are likely to be limited in number, especially from suppliers in your area.

Complete Hive

The complete hive comes with the queen and her entire brood.

Use appropriate transport to move the hive to your property without disturbing the bees.

Before finalizing your purchase of a complete hive, get it inspected by a county or state bee inspector for any diseases or pests. If you cannot locate a bee inspector in your area, get help from an experienced beekeeper. There is a significant risk with any second hand equipment.

You should also examine the brood to find if it has a good number of worker bees, sufficient honey stores, and that the queen has a good brood laying pattern.

This is not the choice I recommend for a beginner as you have to maintain a full working colony from day one.

Leave this option until you have started with either a nucleus or a package and have a full year's experience and more discussions and advice of experienced beekeepers behind you.

Nucleus Hive

A Nuclease (or nuc) is a part of the whole hive housed in cardboard boxes serving as a temporary shelter. The nuc consists of a young queen, a drawn comb where the queen is laying eggs, several pounds of bees, and small honey and pollen stores. Development of bees within a nuc could be four weeks ahead of a package of bees. So, a beehive started with a nuc develops faster than that with a package.

Setting up a Nucleus

Your Nuc may be delivered by the postal service (courier) or you may be required to collect it from the Post Office or from your association. If you have to collect it, they will want you to do that very soon after they notify you of its arrival.

You must protect the package from sunlight and high temperatures which could seriously harm your new stock.

Although the nuc probably has sufficient stores and space for at least a couple of days, get them moved to your hive as soon as possible to minimize any trauma.

They are best transferred when it is cool.

Gently place your tools and the nuc near the hive.

You should wear your protective clothing.

Open the top of the hive and transfer the three or five frames from the nuc to the hive, one at a time. Keep them in the same sequence as they were in the nuc.

Do not squeeze the frames or handle them roughly.

While you are doing this, watch for the queen but do not take extra time to search for her.

You want to complete the transfer as speedily as possible so that there is very little disruption for the bees.

The advantage of the Nuc method over a package of bees is that the bees continue with frames that they are familiar with. This can give them a head-start equivalent to three weeks production in that season.

Package Bees

Bees ready to start colonies are packed in screen wire cages. The package of bees are available in different sizes in some areas.

Package bees are inspected before being sold and should arrive disease–free and in good general condition.

Some dead bees will be found, as with a nuc, but you should contact your supplier if there are a large number of dead or injured bees for no obvious reason.

Transferring the Bees to the Hive

Assemble your new beehive and fit it with frames containing a foundation before the packaged bees arrive.

The best time to install bees into a hive is late afternoon. This prevents any drifting of bees.

If weather turns windy, damp, and cold when it is time to open and put the package into the hive, delay installation temporarily. Keep spraying sugar syrup regularly on the package to keep the bees alive.

Put on your protective gear and set out your package on something which keeps it off the ground near the hive.

Give them a spray of sugar syrup.

Tap the bottom of the package in a flat surface to send the bees to the bottom of the box. It is unlikely to hurt any healthy bees.

Open the cover of the package with your hive tool.

Remove the small square lid on top of the package. You will see the top of the syrup can used for feeding your bees in transit and a wire piece or metal strip dangling between the can and the top of the cage which secures the queen cage.

The queen cage will have a cork or plastic cap over the candy plug in the hole in the top of the queen cage.

Remove this cap. Put the queen cage and feeder can to one side.

Take four frames out of one side of the hive and one from the center.

Hang the queen cage (with the plugged opening at the top) between the two center frames.

Give the other bees another gentle spray of sugar syrup.

Tap the bottom of the package again.

Turn the package over and pour the bees onto and around the queen cage in the gap between the two center frames.

When you have transferred all the bees, discard the package and replace the other frames in the hive. Do this carefully – you want to avoid injuring or killing the bees because this would alarm the other bees at a very traumatic time.

Place your wooden hive feeder on to the hive body containing the bees.

Add sugar syrup to the feeder.

Put the top cover over the feeder.

Set your entrance reducer to the minimum gap.

Your bees will feed on the sugar candy which blocks the hole in the queen cage and release their queen.

Leave your new colony to acclimatize and recover. Don't inspect them for at least five days.

Package bees offer the opportunity to watch growth and development but they need to be undisturbed for that initial period at the start.

The harvest in the first year will probably be less from a package than from other sources.

Hiving a Swarm

Bee swarms should be left to experienced beekeepers. I include these brief notes for completeness, but consult an experienced local beekeeper before trying this yourself.

Bee swarms may be found hanging from a tree, parking meter, or in similar places. Many swarms are searching for a new home and probably are not very aggressive.

Use a small cardboard box with a screened hole about 3"x3" on one side for ventilation and air.

If the swarm is on a low-hanging branch of a tree, place the box under the tree and shake the branch, firmly dislodging bees from swarm. If the branch is very

small, cut it and put it inside the box. Keep the box in the same place for around an hour, so any flying bees can also slowly gather into the box. You can collect the entire brood.

If you want to capture a swarm from the top branches of trees and you are comfortable with the climbing involved, cut off the branch and carefully lower it to the ground. Remove hive covers and shake the branch firmly into the hive to dislodge bees over the combs and entrance of your hive. The bees will start moving into your hive.

Put the hive covers back when the swarm is all in the hive. Move the hive to its permanent location immediately as the bees will imprint their surrounding on their first flight from their new hive.

Swarms that are close to the ground are usually easy to hive. Put a cloth beneath the swarm and place the hive on it. Use your smoker to drive the bees from where the swarm has lodged down towards the hive entrance.

Use smooth weeds or leaves to brush any clustering bees towards the hive. Most bees will be thrown onto the cloth.

Some will start crawling up the board and start fanning at the entrance. Others will go into the hive. Allow bees some time to settle within the hive. Place inner and outer covers on your hive.

The cloth offers a good surface for bees. Otherwise, many would get lost in the grass and weeds or cluster elsewhere.

While hiving a swarm, place the hive in the place where you want it to remain permanently.

Fill the frames with foundation or extra combs, if they are available.

Carefully remove one or more combs from a swarm with a brood and place it in the center of the hive. The comb must not have a queen. Fill the hive with frames. Shake the swarm into the hive gently and allow the bees to settle within. As soon as a few bees have settled inside, let free the entire swarm within the hive. Push all the bees meandering around inside the hive. Make sure that the queen enters the hive or all the other bees will come out.

The swarm may spend the night on the foundation or combs you provide within the hive. The natural instincts of the workers will prompt them to repair old combs or build fresh ones while the youngest bees begin cleaning the comb.

That is how they adjust to their new home.

Helpful Tips

- Hiving a swarm in early spring or summer allows sufficient time for bees to build and gather a surplus.
- Keep feeding the swarm while hiving as this keeps bees busy and the workers will be able to build or repair combs faster.
- After hiving a swarm, move it to a shady location. If left in the sun, the hive could become so warm that the newly hived bees might dehydrate or leave.
- Provide bees with a few drawn combs to accelerate bee settlement within the hive.
- One or two frames of pollen and honey within the hive frames help bees.
- Brush away dead bees from the comb.

Prevention of Bee Swarming

Swarms are great but not when it's your bees leaving home!

So, here are some suggestions which will help you to keep your bees happy at home.

Swarming may be due to overcrowding. The interior of the hives could become hot and congested. Reduce the inclination to swarm by ensuring sufficient ventilation and additional space for the bees to be comfortable and have room to store more produce.

Add more hive bodies and frames. Extract honey more frequently to allow more space for future storage and brood rearing.

Inspect your beehives more frequently during swarming season. Weekly inspections can be a good idea.

If there are many queen cells along the frame bottoms, it may indicate an intention to swarm.

Cut off these queen cells and dispose of them or rear them elsewhere.

Re-queening with young queens early in the season can reduce the likelihood of swarming during the peak season.

Queen and drone traps can be placed at the hive entrance to stop them leaving but this is not foolproof. The traps may catch drones or queens but virgin queens would escape and then swarming would occur.

You should be more careful in bee management if the hive has a queen excluder which is designed to restrict the queen to laying eggs within the brood chamber.

Combining Weak Hives

As a beekeeper, you may have strong and weak hives. It is not possible to save every hive. You could waste lot of time trying to make a weak hive stronger and not get results which repay your efforts.

It is usually better to combine a weak and a strong hive so that you produce one good bee colony with more bees.

It would not work to just replace the old queen of a colony that has deteriorated with a new good queen.

It is best not to combine two weak hives. They will probably not develop into a strong hive despite your most sincere efforts.

The strength of a beehive depends on the queen. If the queen bee is strong and good, the beehive will prosper. If the queen is failing, the colony will soon fail and wither off.

It is best to kill a failing queen in the fall and combine her brood with a stronger colony.

You should have a very strong colony by early spring. You can then split it into two healthy colonies.

Then you can bring in a new queen for the queen-less section of the split. Adding a queen to a split is just like buying a nuc. The new hive will have a good brood, healthy bees, and a new queen. Within eight weeks this hive will develop into a fully productive hive.

During the peak season, a hive may lose its queen. The hive may not be able to produce a new emergency queen.

You can combine two hives, a queen-less and a hive with a queen, with little more than some clean, perforated newspaper.

Place a perforated sheet of newspaper on a queen excluder over the hive with the queen.

Place the queen-less hive on the newspaper.

The bees from the strong hive would first eat away the newspaper. Bees of the queen-less hive would not become laying workers, as the pheromones from the bees moving freely between the sections would discourage ovary development and stop the worker bees in the queen-less part from becoming drone layers.

Sometimes, bee colonies separated with a newspaper would adjust to the new environment and become a better colony, combining bees of both broods with the old queen.

Feeding Your Bees

Beekeepers supplement the food which bees produce for themselves with sugar syrup, usually twice a year.

Sometimes, they feed some syrup with medicine to treat or prevent certain conditions.

Usually, it is sufficient to give them one feed of sugar syrup after you have harvested your honey and another feed of solution when they start to become active in the new season.

Boil the water you will use for the solution, but let it cool a little before adding the sugar or it may caramelize which will hurt your bees.

Most beekeepers use an equal volume of water and sugar.

If you leave sufficient honey in the beehive, bees can survive the cold winter months. Some years honey production in beehives may be less due to lack of proper honey crop. Bees then may not have sufficient honey to survive winter.

You need to feed those bee colonies until they are able to make fresh honey.

Brood rearing starts in late winter or early spring. This is a very critical period and a bee colony may need extra feed to continue rearing and feeding.

Bee Food

Bees can be fed sugar and honey.

Do not feed bees brown sugar, maple syrup, molasses or plain corn syrup. Sugars other than sucrose may harm bees. Avoid sugar products that contain starch.

Honey

This is the best and most natural feed for bees. It is also the costliest. Provide bee colonies with stored honey in frames of comb or dilute and feed like sugar water. Mix honey with one-fourth to one-half of warm water and feed.

Restrict the amount of honey mixed in the water during warm weather as the honey will ferment and get spoiled.

Honey fed in combs or frames can spread diseases through spores.

Do not feed purchased honey.

Table Sugar

Feed bees cane sugar in a syrup solution. During Fall, some keepers feed bees sugar syrup with one part sugar and one part water.

During spring, they may change to one part sugar with two parts water.

Bees have to liquefy solid sugar and bring it to a honey consistency before use. Dry and granulated sugar is good as an emergency feed for bees. However, do not feed dry or granulated sugar if your bee colonies require immediate food for survival.

How to Feed Bees

There are many techniques and suitable equipment to feed syrup to bees.

Entrance Feeder

A quart jar feeder placed at the hive entrance is easy to use. In package colonies, tile syrup in a feeder becomes very cold. It is distant from the cluster. Place the feeder close to the side entrance near the brood nest. Chances of robbing are also minimized.

Tile division-board feeder

Hang this feeder within the hive in place of a frame. It can be easily refilled without removing from hive. This feeder is best suited to provide quick feed for strong colonies. If you want slow and stimulating feeding, do not use this feeder.

Friction Top Can

This is a very popular feeder that many keepers believe suitable for all types of bee colonies. Place it over the tile hole of an inner cover or directly on the frames. Fill unused paint calls, five or ten-pound honey cans, plastic jars, or a gallon glass with syrup and invert it over the cluster. Do not use recycled cans or jars!

If you want to feed an emergency feed to bee colonies, use combs filled with heavy sugar syrup.

Some keepers use a coffee can with a bottom full of nail holes, a sprinkling can, or a fresh garden sprayer to spray or sprinkle syrup over empty combs placed underneath.

A comb filled with syrup on both sides will hold many pounds of syrup. Place two or more such combs next to a cluster in the colony.

Hive Top Feeder

This is possibly the most popular feeder. There is a tray which is sited above the brood box and the bees enter from below through a screened access point.

You can add more solution without disturbing the bees much.

If you have to give them medicated syrup solution, you can be confident that sunlight will not reduce the effectiveness of the medicine because the feeder is completely enclosed.

Pollen or Pollen Substitutes

Use pollen traps to take off fresh pollen pellets from the legs of incoming field bees. Fill combs with these pellets for immediate or later use.

These combs can suffice pollen requirements of small colonies.

If strong colonies are in need of pollen, pour a few fresh pollen pellets into cells on one side of an empty comb and place it in the colony overnight.

Repeat again the next day if there seems to be a need.

You can procure pollen substitutes from bee supply shops. Do not add purchased pollen to pollen substitutes as it can cause problems.

Disease Management

As a beekeeper, you must recognize diseases of honeybees and learn the most effective treatment. It takes experience to spot diseased hives but you can get help from the Agricultural Department in your State or County and, of course, your Bee group.

Here is a brief description of some of the most common brood diseases.

American Foulbrood

B. larvae is the organism that causes American foulbrood. The disease spreads due to lax beekeepers.

The best solution is often to burn the hives and bees but preparations like TM25 can treat a mild affliction of foulbrood in the short-range. Check with your Advisor.

Foulbrood spreads when larvae ingest the bacteria from the nurse bees. The spores take root and multiply, causing death of the larva in the pupal stage.

The cleaning bees get the infection when clearing the larval debris. Then, they transmit the dormant spores to the other bees and the spores end up in the honey or again in the new larva. So, the infection spreads rapidly through the entire colony.

Bees from other hives who visit the infected hive for honey acquire the infection and foulbrood can spread to most colonies in the vicinity.

European Foulbrood

Decreased honey production may be an indication of European foulbrood. It affects mostly weak colonies in spring and summer. The larvae acquire the bacterial spores from nurse bees, but usually die before the cells are capped. The larvae coil up in a C shape and it is possible to clear the soft scales unlike the debris of larvae in American foulbrood.

The treatment is similar to that of American foulbrood: it is best to burn the affected frame. Transferring the frame to another hive can infect the entire colony.

Sacbrood

A virus infection results in Sacbrood where the larvae die before reaching the pupal stage. You can detect infection when there is a change in the color of the larvae from white to grayish white. In closed cells, a small opening could be a sign of the viral attack.

Check for the illness and burn the comb if more than twenty percent is infected. Disinfect the frame properly with formalin or another recommended treatment before re-using.

The best treatment is to maintain cleanliness and to introduce a new queen in the colony.

If more than half the brood has the infection, kill all bees with an insect spray.

Parasitic Mite Syndrome (PMS)

Both mites and viruses result in the parasitic mite syndrome that distorts bees. It is advisable to look for signs before it is too late to treat the disease.

This disease is very serious but symptoms are similar to several other infections.

They may include the presence of Varroa mite, a reduced number of live bees, some adult bees crawling and, sometimes, some tracheal mite infestation in adult bees.

Your Brood may show signs of Varroa mite infestation and twisted, light-brown larva.

If you are unsure, you should submit a comb sample, at least two inches square to the nearest lab.

Prompt action is vital to protect healthy colonies in the area.

Chalkbrood

If you notice chalk-like mummies on the floor of the hive, it is a sign of chalkbrood, which is caused by fungus. It occurs mostly in stressed colonies, so good hygiene and management of the hive is the best protection for chalkbrood.

The ideal treatment is to supply ample food and to re-colonize with a new queen to produce a good stock of bees.

Remove the mummies and any frame which has a high number of chalkbrood cells.

The fungi spores are resistant and can take root in damp conditions so keep the hive area free from dampness to avoid recurrence of chalkbrood.

Diseases of Adult Bees

Nosema

A protozoon named Nosema apis causes Nosema disease in adult bees. Most beekeepers tend to ignore the disease but it may be the one which causes most bee deaths in winter.

The beekeeper may only start wondering when he notices a fall in honey collection.

Adult bees take in the Nosema spores that take root in the stomach to germinate and reproduce. The Nosema-affected cells break up on maturity and mix with the feces.

Usually bees do not dirty the hive, but infected bees discharge a brownish liquid inside the hive by early spring. Some may discharge liquid on the outside of the hive.

Nosema destroys the gut lining in affected bees, hampering their ability to produce honey. Affected bees may have atrophied hypopharyngeal glands and may die. Subsequently, brood production reduces in spring.

Reduce outbreaks of Nosema by:

- Improving ventilation and air circulation in the hive.
- Site the hives to avoid damp conditions and remove any trace of damp in the hives.
- Check that the all your bees have access to a reliable source of clean water.
- Ask your advisor about medications which are available.

Mites

Varroa and Tracheal mites are the most dangerous mites affecting bees in most states of the US. Tracheal mites first appeared in the US in the 1980's while the Varroa mites appeared only in 1987 in a Wisconsin apiary.

They spread rapidly affecting bee populations across North America.

Researchers at several American universities have come up with bees resistant to tracheal mites. Sugar and grease patties are claimed to be an effective way to treat tracheal mites.

There are also several other chemical and nonchemical ways to treat these mites.

Varroa mites may be present if you see:

Deformed bees

Spots, red or brown, on bee larvae.

The death of an entire colony in late autumn.

Mites on adult bees. This indicates very high numbers because the mites always target larvae in uncapped cells first.

Use a Varroa screen to remove a significant proportion of Varroa mites that get on to your bees.

Apistan® and other miticides are claimed to be effective against Varroa. They must be used strictly in accordance with directions (including the safety related ones) or you are wasting your time and money and will not help your bees.

Pest Management

Bees have several enemies that can harm or destroy them, intentionally or otherwise.

Bears

Bears love honey and the brood. They destroy the frame and eat the combs. You will probably need an electric fence around the hives if bears are active in your area.

Birds

Some birds like sparrows, woodpeckers and Martyns eat adult bees. It is best to chase them away from the hives with scarecrows or other non-destructive methods as birds are a mostly protected species.

Ants

Ants do not hurt the bees but are a problem for the beekeeper. They may make a nest around the top cover and even inside the hive. Avoid chemical repellents for the ants as it can harm the bees. Set the frame on a stand with its legs in oil so that ants cannot reach the hive.

Cattle

Cattle harm the hives by rubbing against the frames vigorously and toppling them in the process. You need a fence of some sort between the cattle and the bees.

Small Hive Beetle

The small hive beetle likes weak colonies, eats, brood, eggs and almost everything except adult bees. Its feces spoil the honey that it doesn't eat. It's bad news but may not appear in the cooler states as it is tropical in origin.

Contact your State Apiary Inspector to notify him that you think you have an infestation and get the most current information about possible treatments.

Some chemicals that have been approved for use on this pest have been heavily restricted in their use.

Frogs

Frogs are an asset to any garden and will be present in damp patches around the hives. Some frogs may consume bees but you can't (and should not) do anything about them.

Fire Ants

Fire ants build nests on the ground close to beehives and pose a danger to the beekeeper. The bite results in a swelling that stings and gets scratchy.

Keep your hives raised on bricks and wear clothes that cover your legs completely when working with the hives.

Rodents

Rats and mice will nest in the hives, damage them, foul everything with their droppings and eat the honey.

Use metal guards around the stands and at the entrances. Poisons will do more harm to your bees and other harmless wildlife.

Raccoons

Raccoons remove the top of the hives unless you secure it with a rock or other heavy object. They also drink the honey and eat the brood. The best option is to catch them and remove them from the area.

Skunks

Skunks shake the hive so that the bees fly out and then gobble them up. To avoid this menace, keep the hives at a height above the ground and put chicken netting on the ground to deter the skunks.

Moths

Wax moths lay their eggs on the comb before the supers are stored for winter.

Their larvae destroy the wax comb by tunnelling through it.

The best treatments are fumigation with an approved chemical or freezing the combs if you can get access to a suitably large freezing chamber for 24 hours.

After that, store the combs in tightly sealed heavy duty garbage bags until you need them.

Wasps like honey but they are also responsible for a lot of the stings which bees get blamed for.

Beekeeping Management During Summer

Summer is the peak season when bees are most productive. They make lots of honey and increase their brood. They fly from their hives in search of nectar and pollen.

If a beehive is in a favorable location with many crops like yellow sweet clover, fruit trees, and flowerbeds available, honey production should be good.

Bees sustain themselves by consuming honey and pollen. It takes one frame of honey and pollen to produce one frame of bees. In summer, when bees collect more nectar, the surplus is stored in honey supers.

A good bee colony requires a productive queen which lays many eggs.

If your hive has just started on a new foundation, feed the hive some sugar solution to help the bees establish.

Initially, your bees have to build a new comb, raise the brood and store food which reduces their time and energy for nectar scouting.

Provide bees with sugar syrup to help build the hive. But, stop the sugar syrup supply when the bees are settled.

Honey made from sugar syrup is not pure honey.

Make the bees go scouting for nectar so that you get quality honey.

Before winter sets in, leave enough honey for bees to survive the cold season. A new hive should have at least one of the broods of a double brood chamber completely filled with honey. This should provide sufficient honey for the bees to survive winter.

A hive of honeybees may consume sixty to ninety pounds of honey during winter.

You must complete removing your share of the honey from the hive during summer. Once honey is fully capped over (bees have filled almost 7/8th of the frame with the wax covering), you can remove it safely from the hive.

Bees put wax covering on cells containing honey. Uncapped cells carry unripe honey which has a higher moisture content in it. This honey would be spoiled if taken out at this stage.

If honey collection is late, extracting could be difficult as honey turns stiff and will not flow out easily.

Beekeeping Management During Fall

The fall season is important for beekeepers. This is when you prepare your hive to survive the harsh winter conditions.

Bee colonies may require sixty to ninety pounds of honey to survive the entire winter.

Beekeeping management in winter starts during the fall. The fall is almost the start of a new bee year. Proper beekeeping management in the fall will reduce problems you could face in spring. After removing honey, you should carry out various tasks to get your bees prepared for winter.

Hive Examination (I)

Hive examination should be done when it is warm, from midday or on sunny afternoons.

Wear protective gear and light your smoker.

Gently approach the first hive from the side and use your hive tool to remove the top cover.

Keep the cover upside down and blow a little smoke towards the entrance.

Remove the inner cover to expose the top bars of the frames. Bees may get disturbed and try to come out between the top bars. Use just a little smoke to calm them.

Use slow movements to examine everything within the hive.

Check if the bees are building a new comb on the available foundation. If ¾ of the comb is drawn out (containing or ready for honey), add a new super.

Do not take away the last frames as bees use them for honey storage.

Check the brood. If you see many eggs, the queen bee is probably fine and healthy. Larvae look like a coil worm within a cell.

Also, look for capped honey. These are cells with a distinct whitish color.

Pollen cells will look yellowish or brownish in color.

A healthy hive should have frames almost covered with the brood, honey on top of the frame and pollen stored between the two.

Do not keep hive open for very long.

If the hive is becoming too crowded, add more supers or boxes to allow for expansion.

Inspect the beehive thoroughly for any diseases.

The brood should be healthy without any spots.

Spots may indicate disease or the presence of mites.

Always use proper equipment and bees from recommended suppliers to reduce the chances of disease.

The hive needs sufficient honey supply to carry it through the winter months.

Hive Management

Prepare the beehive for the ensuing winter months by placing an entrance reducer at the front entrance. This will reduce the possible damage due to cold winds or mice.

Use miticide strips to protect hives from mites. Check with your agricultural advisor for recommended treatments which change year by year.

Hives should have a slightly sloping front so that water flows down and not into the hive from the landing area on the bottom board.

Allow sufficient ventilation and easy air movement within the hive to reduce unwelcome condensation in the hive.

Managing Bees within Your Hive

You should check the honey supply for the bees to use through the approaching winter. If it is low, consider feeding your bees some sugar syrup with sugar and water in a 1:1 combination before the weather becomes very cold.

If the beehive has a failing queen, fall is the time to replace it. Waiting until spring to replace a failing queen may cause the loss of the entire bee population within the hive.

Managing Bees During Winter

Bee management for winter should include:

Hive Inspection

Hive inspection during the first winter months should be on warmer days if possible. Bees come out of hives during midday on such days. The rare but pleasant sunshine warms the sides of the beehive and encourages the bees to take flight.

Do not remove frames to inspect your beehive. Even small disturbances to beehives at this time can bother bees and some will come out to check.

Gently separate the two hive bodies that make up your hive to check the presence of bees within the hive.

You can also hear the friendly roar of bees. This tells you whether your bees are alive within the hive.

Do not go searching for the queen.

Bees need to conserve as much heat as possible to keep them warm and alive in winter. Inspecting the hive for a long period of time would make the hive colder and you may cause great damage to the bees and the hive.

Cluster Inspection

Your hive has bees that emerged during the fall. They are now adult bees. A good cluster of bees can maintain a constant temperature of around 92 degrees F within the cluster.

The queen will restart laying eggs later in winter.

A healthy cluster will be able to maintain the eggs when they have substantial honey deposits to feed the eggs until the next season of nectar collection starts.

A smaller cluster may find it difficult to sustain during winter.

While inspecting clusters, only remove frames outside the cluster. Remove the frame and slide it away from the cluster to avoid crushing any bees.

Honey Supply

You should have left a sufficient honey supply before fall set in so the bees could carry on through the winter.

Bees plan their egg laying process according to the availability of the honey supply. Some bees conserve their honey supply while some others may not do so.

Checking Honey Storage

Once egg laying starts, the bees' honey supply could be used up very fast.

Check your beehives for availability of stored honey. You do not have to open each hive and inspect the frames for leftover honey supply. Just lift the hive a little and tilt it very slightly forward.

Lighter hives have less honey supply.

Beekeeping Management During Spring

Beekeeping management for spring includes:

Hive Inspection

If you did not use mice excluders, check each hive for mice which build nests in lower frame corners in winter.

Remove damaged frames and mice nests. Remove any mice in the hive and secure the point through which the mice got in.

If you have a plastic foundation, mice cannot do as much harm to these frames but they need to be sterilized to prevent any germs from the mice affecting anything.

Put all hive bodies above the top cover and scrape the bottom board of the hives with a hive tool to clear all dead bees and any accumulated debris.

Check and reset everything.

Treat hives for any mites.

If needed, put a fresh coat of paint on a beehive provided paint is rated not to affect bees.

Hive Strength

Check each hive for a healthy queen and brood. If the colony is weak, kill the existing queen and bring in a new package to re-invigorate the existing bees in the hive.

Some keepers with many hives, borrow brood frames and bees from stronger hives and strengthen weak hives. This is called 'equalizing the brood' but it is better to make one colony from a weaker and a stronger colony as explained elsewhere.

More Supers

Have additional supers ready to be put on beehives when there is favorable weather and intense bee activity.

If the weather is still cold, bees may not be able to collect nectar, so wait to add more supers.

The ideal time to add supers is when dandelions, maple, and apple trees bloom and provide a pollen supply for bees.

Capped Honey

Inspect each hive for available accumulated or capped honey.

Replace the entrance reducer to help hives protect their limited honey stock.

If the capped honey stock is dismally low, use a feeder to feed sugar syrup to bees immediately.

If there is a growing brood and honey supply is low, the hive might require around ten pounds of sugar syrup in a week.

Also check for pollen as this is the protein source for the growing brood.

Laying Queen

The queen bee often starts laying eggs in late January and there should be plenty of workers at the beginning of spring.

If the queen is not laying, bring in a new queen and kill the old one just before replacing it. Queen replacement should always be done within twenty-four hours maximum. If bees do not find a queen in this time, they will start rearing a new queen and then may kill any queen that you introduce.

Brood

Brood production depends in part on the available supply of nectar and pollen. If bees find many good sources to feed larvae, a queen might lay as many as 2000 eggs each day.

The brood nest can become very large. The increased adult population could need more space.

This could cause swarming.

Your First Harvest

Let me set your mind at rest about one potential disappointment that almost every new beekeeper has after their first year. Your first crop of honey is likely to be below your expectations.

That's normal and nothing to worry about. Even if the season has been perfect, you and your bees have been on a major learning curve.

In fact, even the most experienced beekeepers can have seasons where their results are much below their expectations. It's a fact of life for anyone who deals with any kind of livestock or crops. Nature always has the last word.

Getting your honey with minimum disturbance to your bees and problems for yourself requires some care through each stage.

Like every other part of beekeeping, careful preparation can pay big dividends here.

Do as much as you can by the day before you intend to harvest so that you can get some rest and be ready for an early start.

You did check the weather report the night before, didn't you?

Check your protective clothing and all of your bee-handling equipment.

I have a list of all the equipment in the lid of the box I store it in so that I can be sure that nothing has been lost or borrowed and not returned (which is often the same thing!)

Be sure you have protective clothing for any guests that you have invited to help you.

Extracting the Honey Crop

You would expect beekeepers to have invented many ways to remove honey from hives and keep the bees away from them and any helpers they invite to Harvest Day.

I'll just cover a few of the most common and practical methods and mention a few other tips.

You need to decide when the honey is ready. That's when your bees have filled and capped the combs with honey. That might be much earlier some years than others if there is an extra heavy flow of nectar in the area. You might even get two harvests in the same year and the honey may have distinctly different flavors if your bees were foraging on different plants for the nectar each time.

You should not extract or use honey from uncapped cells. This will have a higher water content and is useless until it has cured.

Also, never top up any honey that you harvest with water. It will ruin it!

On the day, you need to get the bees off the frames from which you will extract the honey.

Brushing the Bees

You can take out the frames, one at a time and gently shake the bees off the frame in front of the hive entrance.

There is a special Bee Brush which you can use for this purpose too.

Cover the frames and put them in a box, then take them to the room where you will extract the honey as soon as possible.

Do not leave the frames in the open because the honey will attract bees and maybe other creatures like wasps!

Escape Boards

Some beekeepers use a board between the super they want to examine and the broad chamber which has a wide exit on the upper side but some sort of maze on the lower side. The idea is that the bees can easily move from the super down into the brood chamber but will be unable to find their way up again.

The Escape board, of whatever design needs to be placed at least a day and preferably several days before you want to remove the frames.

It is not worth the trouble, time and expense in my experience.

Bee Blowers

You can prepare your own blower or purchase one. The super is placed in the elevation and the blower's nozzle is run across every frame to remove the bees. The bee blower is used by many commercial beekeepers as it is fast and works equally well in both cold and hot temperatures.

But, I believe it is not a good choice for the amateur beekeeper because of the cost and the effect it has on your bees.

When removing honey from the hive, it is essential to leave enough honey to get the bees through the winter, about sixty pounds of honey per hive. You can estimate the amount once you check the brood chambers. A frame full of honey approximately

weighs around six pounds. The bees will require around ten of these, on the other hand two shallow frames will be equivalent to one deep frame.

Once the honey is removed from the hive, it is transported to a location where it is safe. While removing honey from the hive it is essential to leave some honey, enough to last over the winter, in fact at least sixty pounds of honey must be left behind. You can estimate the amount once you check the brood chambers. A frame full of honey weighs approximately six pounds. The bees will require around ten of these, on the other hand two shallow frames will be equivalent to one deep frame.

Extracting Honey

Prepare the area where you will extract and store the honey comb or liquid in advance.

This will require a large area and you must cover anything which might be affected by any spillages. They're inevitable!

You must ensure that the room is secure from invasion by bees, wasps or other creatures that smell the honey.

The equipment must all be spotlessly clean – you are handling food which you, your family and friends will consume.

If you want to sell any of your honey, you need to be aware of health and food marketing regulations in your area.

You may need to register or get a license and each package will need to have a label with the required information. That usually includes the type and weight of the honey, year of production and name and address of the producer as a minimum.

Equipment

Buckets: These buckets are made with food-grade plastic and you need at least one with a tap (honey gate) near the base. You pour the extracted honey from the extractor through your sieve into the bucket. Then, seal it with the lid and leave it for at least 24 hours. That gives time for air bubbles in the honey to collect on the surface. Then you can remove them so they won't affect the bottling process.

Uncapping fork: This tool has a number of flat metal teeth and is useful for removing any caps that you miss with the uncapping knife.

Some keepers also use this to remove the caps from a few cells during the season when they want to check for the presence of Varroa mites in the brood frames.

Uncapping knife: This tool has a broad, flat blade and is electrically heated which helps it to slice cleanly through the wax caps the bees have put over each honey-containing cell.

You can use a sharp bread knife as a substitute when you are just starting or if you want to keep costs low. Warm the knife by dipping it in hot water before each slicing operation but wipe all water off the knife so that none is added to your honey.

Extractor: These are machines for spinning the uncapped comb sections so that the honey is drawn out and collects in the base of the extractor.

Both manually-operated and electric extractors are available.

If you don't have your own extractor, you can usually hire one from your Beekeeper group or another Keeper. Make these arrangements as far in advance as possible because there is a great demand for a limited supply during peak season, especially at weekends.

If you haven't used one before, try to get some instruction by someone that is familiar with the particular one you will use.

Using a extractor saves time and mess. You can also return the comb for the bees to clean and use as a base for next year's harvest.

Jars: You must use new jars for any honey which you will sell. Be aware that lids of recycled jars which you use for honey that your family will consume may often keep the odor of their previous contents even after thorough washing. This can negatively affect your honey.

Seal your jars as soon as they are filled and store them out of the light at room temperature.

Sieve: You will probably need to put your honey through a sieve to remove any other material such as pieces of caps or bees before it can be stored.

Wax Container: This can be a simple plastic box with a tightly sealing cover or you might invest in one that has two sections; an upper section where you put the wax and a lower section where any honey remaining in the caps drains to and can be easily recovered for your own use.

Comb Honey

Comb honey is still popular though the amount produced is less, partly because it requires more effort from the bees and a reliable source of food for them to be able to produce it. Most beekeepers use extractors to produce liquid honey from most or their entire crop.

If you used frames with no wire support through them, then you can just cut out the comb from the frame (or some of the comb if you want to extract liquid honey from the rest).

That's much easier than getting the comb out from wired frames though that is possible.

You can also get square or even round sections which can be used in your hives for the bees to build their combs in to. These only need a cover and a label to be applied before being offered for sale.

Another popular way to present comb honey is to put small chunks in a jar of liquid honey.

Liquid Honey

Most honey is produced in this form.

Plug in your uncapping knife and hold the first frame above the container where the caps will fill in.

Start sawing your knife across the frame under the caps a couple of inches above the bottom of the frame.

When you reach the top, bring your knife back down to remove the caps from the cells in the lower section of the frame.

Use a “Cappings scratcher”, also called an uncapping fork, to remove the caps from cells which your knife missed, probably because the tops of those cells were a bit lower than the rest. This tool usually has eighteen or twenty stainless steel prongs which are set in a single row at right angles to the thick wooden handle.

Some keepers also use this tool to pierce a few drone cells and remove the larvae for inspection when they suspect there might be a mite infestation.

Repeat the whole uncapping procedure on the other side of the frame.

Set each frame, after you have removed all the caps, in a slot in your extractor.

Take care with this so that the weight is balanced as evenly as possible in the machine. Otherwise, the whole machine might start jiggling across the floor or bench when you switch it on or start winding the handle.

When the rising level of honey in the machine makes it difficult to keep rotating the handle, let some of the honey out through the tap at the bottom.

The cappings are worth keeping but you need to take care to remove every bit of honey from them before melting them into a cake or two of wax. This takes time and some effort.

When the honey is in your jars (make sure that no air is trapped in with the honey), then seal and label them.

If you find any comb contains granulated honey, the best course is to return it to the hive where the bees will clean it and re-use it for fresh honey.

Granulated honey is otherwise useless.

Transporting Hives

Moving full hives requires at least two people. It will be much easier if you can get help from someone that has done it successfully before transportation or, at least review your preparations and equipment before the day of the actual move.

Allow plenty of time for each part of the move, including set-up at the new location.

Some beekeepers leave the entrance of the hive open, but it is probably better to close it.

Never tip the hive off the horizontal – damage is almost inevitable.

Use mechanical methods over muscle wherever possible so that you and the cargo both have the best chance of getting safely through the whole experience.

Don’t underestimate the weight of the hive.

Use a net over the load when it has to be trucked anywhere and put the fastening straps over the net.

Check and comply with all requirements of the authorities and the transport company (if you use one).

Don’t forget to get insurance cover.

You can start with just one or two hives. Don’t set up any hive to face exactly the same direction as another. The bees from each colony will remember the layout of the area around the hive when they go foraging and the variation between your hives will help them to find their way back to their correct “home”.

If the area you choose to locate your hives has a slope, the actual hives need to be level. You can either dig out a “shelf’ to put the base on or use a stand.

A stand is advisable even on level ground because it keeps the hive entrance clear of any grass or other vegetation.

I recommend starting with one hive and adding another for your second season. Two hives are not much more work than one but you may want to keep the costs and time needed to a minimum for that first year.

After that, a minimum of two hives could give you a reasonable amount of honey and other produce to repay your effort, money and time.

The second hive also lets you compare the general behavior and productivity of the two colonies. If one colony is producing a significantly different number of dead bees (some are inevitable), or you can see that its bees are not as active as the other colony, that can be a valuable early indicator that you need to look for reasons such as predators, disease or whatever.

Two hives will be adequate for many readers. Others may have the space and other resources to comfortably handle four. If you want to build a part-time income, then you may build your apiary up to ten, twenty or more hives over time.

Just give yourself time to complete each step in a methodical way to minimize any risks and maximize your enjoyment.

Important Terms

Anaphylactic Shock: Rapid tightening of muscles around a person's bronchial tubes caused by extreme sensitivity to venom such as bee stings. Requires Immediate Medical Intervention!

Apiculture: The science behind beekeeping.

Bee Brush: A brush with soft bristles used for gently dislodging bees from frames.

Bee Dance: Series of rhythmic movements which a returning bee uses to somehow communicate details of a food source it has located on its most recent flight to other bees.

Brood: Immature bees; eggs, larvae and pupae.

Burr comb: Extra pieces of wax comb which bees build between the wax in two separate frames.

Cappings: Thin wax covers over comb cells. Highly prized source of quality beeswax for candles and other items.

Chilled Brood: Bees that have died because of cold. Good beekeeping practices should reduce or eliminate this from your hives.

Cleansing Flight: After bees have been confined during winter or for some other reason, they fly around and defecate. Their droppings can spot clothing and even damage a car's paintwork. Bees are tidy creatures that won't foul the hive unless they are sick.

Comb: Wax cells in which eggs, honey and pollen are deposited.

Drone: Male bees that fertilizes the Queen. It does no other work.

Entrance Reducer: A piece of wood (sometimes plastic) which fits into the hive entrance. It has a wide notch cut through one surface and a narrow notch (sufficient for one bee to pass through) in the adjoining face. The keeper can allow one or several bees to enter the hive at one time (and reduce or increase the air flowing into the hive from the entrance by changing the way the block is set in the hive entrance.

Some types of hives have a sliding section which can be adjusted manually to do the same task. This has the advantage of being attached permanently to the body of the hive.

Feeders: Devices which can be used to deliver sugar-syrup or other food to bees.

Guards: Young worker bees that protect the hive entrance.

Hive Tool: Valuable device for all beekeepers. Used to open hives, separate frames and even, sometimes, to remove stings by people whose fingernails are too short to grip the stinger.

Italian Bees: Highly popular species of domesticated bees. Good strength and disposition. *Apis mellifera ligustica*

Killer Bees: Aggressive strain of bees which resulted from scientific experiments crossing wild African bees with quieter European types. Far less dangerous than their media promoted reputation might suggest. One reason that some areas have very strict rules *against* bee keeping.

Nectar: The source material for honey secreted by plants and collected by bees.

Pollen: Male reproductive cells collected from flowers by bees and used as a source of food.

Propolis: A glue produced by the bees from plant material and used for internal maintenance of the comb.

Queen: The only fully potent female bee in a colony. Has a stinger that can be used safely more than once. Main job is to lay the eggs (up to 2,000 a day!) which become the next generation of the colony.

Smoker: Essential device that looks like a metal can with a bellows and a spout on opposite sides. Produces smoke to calm bees and encourage them to move from the area of the hive which you want to work on.

Sugar-Syrup: Mixture of white sugar and water, usually 1:1 or 2:1 by weight or volume which is fed to bees.

Workers: Female bees who do all the work in the colony except for egg-laying.

Suppliers

I recommend that, where possible, you find a reliable local source for as many of your supplies as possible. This supports local business which puts money back into your area and also gives you an experienced source for information and advice.

But, many people don't have local suppliers, especially of some of the less common items.

I hope you find this list a good start. It is not comprehensive but will give you some ideas.

This list is provided without warranty of any kind. You must take full responsibility for your use of the list and any consequences.

United Kingdom

Thorne (Beehives) Ltd: Manufactures beehives. Sells wide range of supplies on Internet http://www.thorne.co.uk/ and shops in England and Scotland.

National Bee Supplies: Okehampton, Devon http://www.beekeeping.co.uk/ "Beekeeping equipment, supplies and fine quality beehives"

NATIONAL BEE SUPPLIES

Makers of the finest quality Bee Hives

U.S.A.

Mann Lake Ltd: Sells beekeeping supplies world wide to hobby or commercial beekeepers.
http://www.mannlakeltd.com/

Betterbee: 8 Meader Road Greenwich, NY 12834:

http://www.betterbee.com/

Beekeepers Serving beekeepers

Canada

Country Fields Beekeeping Supplies Ltd.:

http://www.countryfields.ca/

Australia

Pender Beekeeping Supplies: Penders supply beekeeping equipment throughout **Australia and New Zealand**. We specialise in the supply of high quality honey extractors, honey tanks http://www.penders.net.au/

(Home page is out of date since Jan 5th 2009, so check before ordering)

Redpaths Beekeeping Supplies: Supplies hives, queen bees, bees wax, foundation, extraction equipment, honey, and protective clothing

http://www.redpaths.com.au/

Thank you for buying my book.

I hope that you find my book helpful as you begin your beekeeping venture.

I have found many benefits other than delicious honey and some handy money in the years I kept bees.

The exercise and fresh air seemed to help me have fewer colds and other minor ailments.

The ability to watch and enjoy the activities of the bees was a great bonus.

But, the best thing for me has been the people from all types of backgrounds that have shared their experiences and ideas in beekeeping.

I hope your experience is as rewarding in all these ways.

Terry Martyn Jr.

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