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About the Author

Milton Bradford wrote "Bees in Your Garden" to share what he learned about adding a couple of hives to a garden.

Milton said, "A lot of the books are focused on the honey and making money from it. I found that it wasn't an easy way to riches!"

"But, there were other advantages from setting up a couple of hives in your garden which are less obvious."

"Some people make it sound a lot easier than you might find it in reality. So, I wrote out what I'd learned and gathered from research and discussions with other gardeners who'd tried it."

Milton said, "Most gardeners can benefit from having their own bees and they'll help their community without any extra effort."

"My book will help readers set up the right sort of hives and bees for their situation and avoid many of the problems others have."

Milton warned, "There's work, effort, and expense required, but I will show you how to do it right, so you minimize your investment and get good results."

"There's no guarantee that you'll make money from honey and you may still have some poor years due to factors we can't control. But, you will improve your neighborhood, get better crops most of the time and help bees continue to pollinate our food crops and flowers so we can all stay healthy."

Introduction

Most people know that bees are one of the most important pollinators.

Unfortunately, bee populations are decreasing from a number of factors in most parts of the world.

Many gardeners would like to add a couple of hives to their garden to improve the pollination of their plants and get their own honey at their own doorstep.

There's a lot of information out there and much is contradictory, out of date or lacking detail.

Some is biased which helps no-one!

This book will give you what I've learned in plain language and without any particular bias.

You'll find answers to most of your questions and links which will help you get more information from trusted sources. The situation with bees is changing all the time but the links will help you stay up to date.

Some questions/subjects I cover include:

How much time and money will it take to set up a couple of hives and maintain them?

What are the essential equipment all beekeepers need?

Different types of Hives.

Problems for bee-keepers.

Myths and lies about bees and beekeeping.

...... And other important topics to help you start right, save time, money and effort.

I haven't got into the topics of advanced beekeeping practices.

I don't want to give you information which won't be useful in your first couple of years.

Beekeeping – Start Here

Most people want to add one or two beehives because they want to get their own honey and ensure that it is, as far as possible, pure and fresh.

Some people have become aware of the challenges which have reduced bee populations in most countries in recent years and they want to help, in a small way, and support this invaluable pollinator.

They know that their bees will pollinate their own garden, so crops should be larger and probably healthier.

This section will give you the information you need to check if you are allowed to keep bees and how to ensure that your neighbors come inside and work out what choices you need to make before getting your first hive.

Can You Become a Beekeeper?

You need to confirm several things before actually paying any money.

The first is whether there are any restrictions on having beehives in your garden.

You need to check with local and state authorities about this. State authorities may not allow certain breeds of bees to be kept.

Local authorities may have restrictions on whether bees can be kept at all, how many hives can be in one location and require consultation with neighbors.

The attitude of your neighbors is critical. Some may have objections because they are allergic to bee-stings or that their pets may be at risk.

Others may fear that your bees will sting them or foul their cars or other possessions with their droppings!

These things do happen. But you can reduce the potential problems by planting hedges or putting other barriers at least six feet (180 cm) high between the hives and the neighbors' properties.

You need to own the property or have permission from the owner to keep bees.

You will need to ask your insurance company for third party cover for any damage due to your bees.

Impact on Your Family

You will need to check the costs involved for you to set up a couple of hives. One is okay but you will probably want to add a second after a fairly short time and it's best if you consider the extra cost and space requirements now.

Hives should be about three feet (90 cm) or more apart.

This gives the bees in each hive room to come and go without bothering their neighbors in the other hive.

It also gives you enough space to do maintenance on one easily.

Can You Avoid being Stung?

You can reduce the possibility of being stung by being aware of the bees and not making sudden movements when you are near them. But, most people that live with bees are likely to be stung by them at some time.

Your Pets

Dogs are likely to be curious and investigate the bees which means they could be stung. Best to fence them off or train them to stay clear.

Cats will usually avoid hives and buzzing bees.

You may find an occasional bee drowning in any water dishes left outside for pets.

Any water dishes you put out for your bees should be high enough to be out of reach for other pets and have flat pieces of wood in them which the bees can stand on while they drink. If there are no platforms and the bees have to grip the sides of the dishes, they will probably fall into the water and drown. They cannot swim.

Your children should always be supervised when near the hives.

Where to put the Bees?

This is a decision to take care with because you don't want to move your hives after the bees are established in that spot unless you really need to.

That's because your bees use an internal "G.P.S." system and will be upset if their hive is not where it was when they started their flight that morning. They won't search for it and could die.

The obvious location is in a cleared area in your garden.

Have the entrance facing the sunniest aspect of your property so the bees get early sun to encourage them to get to work.

Shade is helpful to protect them from extreme summer heat.

Food: Try to arrange some bee-friendly plants fairly close.

Water: A water dish with a platform which is just the height of the water is a good idea.

As well as drinking water, bees use it to make bee bread from pollen which is the food for growing bee larvae.

Toilet time: Allow some space between the hives and washing lines, or areas where cars etc., are parked. The bees relieve themselves when they are flying to avoid fouling the hive.

Access: You need to have easy access for yourself and your equipment at all times. This helps protect you from injury and reduces the time and effort required to maintain your hives and the bees.

Drainage: Make sure hives are not situated in soggy areas and that rain is able to get off them easily. This reduces the likelihood of attacks from fungus of various kinds which can become serious problems.

Traffic: Keep the hives away from paths which are used by a lot of people and use tall plants or a fence to get them flying fairly high if there are roads or walkways near their flight path.

Accidents can be caused by motorists or even pedestrians encountering a bee!

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Wind: Your bees need protection from the strongest (prevailing) wind which affects your property. That wind could take some of their energy when they fly out and reduce their ability to search and bring back pollen.

Hedge, fence or tall plants: These should be at least six feet (180 cm) high and placed between the hives and the neighbors. This will make the bees fly up above 6 feet and reduce any interaction they might have with your neighbors and anything on their land. It won't prevent them harvesting pollen from their plants.

Stand for each Hive: Each hive should be set up on a stand which puts it at a height which will be comfortable for you to work.

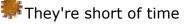
The stand could be wood or metal – whatever is available to you. Make sure the top of the stand is flat so the hive entrance is not blocked. The stand also ensures that vermin cannot get easily into your hive.

Protect Yourself

Using protective clothing to avoid stings (which also kills the bees which sting you) needs to be second-nature.

I know many people who often don't suit up every time they visit their hives because:

They're only going to make a quick check



They never get stung!

That's like the person who doesn't use sunscreen!

If you protect yourself, you avoid pain and set a good example for your kids or other people that visit your hives.

What You Need to Use every time



A hat with a brim. You need protection from U.V. rays even when the sunlight is not intense.

Net from brim which covers your shoulders. You can also get various forms of more sophisticated net protection.

Gloves are avoided by some experienced beekeepers because the effective ones are fairly thick, without any ventilation. But they help avoid stings and injuries from damaged frames etc.

Eye protection if you remove the netting.

Coveralls or (2nd best) bib and brace overalls with a thick work shirt.

Socks.

Shoes which fully cover and support your feet, not thongs or sandals.

** Check that there are no gaps between your gear where a bee could climb in and sting you. **

Don't forget to get a set for each family member and also some items for use by casual visitors.

You will still need third party insurance. Get advice from your Bee Club or other bee keepers in your area before checking or buying policies.

Bee Breeds

Carnolian bee, Apis mellifera carnica

Originally from Yugoslavia and nearby countries,

Tend to swarm more than other varieties.

Smaller, hardier colonies which require less of the stores they've produced for over-wintering.

Good producers.

Not aggressive.

Will still look for food in poor weather.

If ordering a queen with your package of Carnolian bees, ask that it is marked as they are harder to distinguish in this breed unless you have some experience.

Italian Bees (Apis meliifera ligustica)

These are very popular, give good honey production and are not easily upset.

They tend to produce larger colonies which, of course, need more of the stored nectar for over-wintering than some other types.

They may take a little longer to build up numbers in spring.

You should remove honey-filled supers when flow stops.

This breed is particularly prone to robbing other hives. This can result in the transmission of diseases etc., from those hives to yours.

But, this breed is still the most popular in North America at this time.

Russian Bees

The Russian bees were imported to the U.S.A. by the U.S.D.A. to test whether they were more resistant than other bee breeds to the Varroa mite. Tests were positive though the resistance is not 100%. If they mix with other bee breeds, their Varroa resistance is likely to be weakened.

This type of bee is available commercially.

The Russian bees also have good housekeeping habits which reduces their susceptibility to the tracheal mite.

Equipment

A separator for extracting the honey.



Wheelbarrow or hand truck for shifting the honey supers.

(Average weight is likely to be around 40 pounds (about 18 kg).

Uncapping tray.

Filters.

Sealable, food-grade receptacles for your honey.

Labels - Check what information is required by regulators.

Feeder for feeding the bees until they have built up stores in the hive.

Queen Marking Pen. You can spot the queen by its particular features such as size and absence of "baskets" on the rear legs, but you need to be sure that a queen bee from outside has not got into your hive and taken over after killing your queen!

Bee Brush

This tool is used to brush bees off honey supers when harvesting them. Some people use a goose feather instead of a brush.

You need a brush which has very soft bristles to reduce, but probably not eliminate, injury to your bees.

It is important to flick the brush or feather rather than drag it over the comb.

That's because the cells have a protruding lip at the bottom which helps keep the nectar in place until the cell is capped, so you don't flick downward unless you turn the super upside down first or you flick upward so you don't crush

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your bees against the lip of the cell!

Bee Escape Board

This is a board with a hole in it that is placed under a honey-filled super that you want to harvest.

Get your escape board in place below the super the day before you will harvest the honey.

The bees will leave the super to go down through the escape board into the brood area where they focus on keeping the brood warm through the night.

Only very few bees, at most, will be able to get through the escape board back to the honey super the next morning.

Pacify them with a gentle puff from your smoker and brush them off.

Then, remove the super for harvesting.

Remove the bee escape. Then you can close the hive and go to the next one or harvest your honey.

There are various designs of bee escape boards. Some say that the triangle escape type will block most bees from returning to the honey super.

Butterfly net

I got this from a toy store. Beekeepers sometimes find their bees visiting them in their homes. This is as easy a way as there is to remove them back to the area near their home, the hive.

You may catch other insects which might prey on your bees too. It's better than using insecticide!

Feeder:

There are many types of feeder which are used for supplemental feeding and when you are setting up a new colony in a hive.

Plastic Bag Feeder:

This is the simplest type of feeder and works surprising well.

The drawbacks are that the filled bag is fairly heavy. You don't want to have

to move it until the bees empty it.

The advantages are that bees usually use it without many drowning compared to other types.

Just take a large size zipped plastic bag. Fill it about 90%. Press the seal firmly and lay it on the side in a frame which surrounds the bag.

Cut three lines in the upper side of the bag above the air bubble. The bees will stand on the bag and drink the sugar water.

Smoker



These come in various styles. There is a cylinder with a section at the bottom where the material you burn is placed and a nozzle at the top to direct the smoke.

There is also a bellows attached to the side which you hold on to and squeeze to push air into the cylinder and push the smoke up and out through the nozzle.

Torn-up pieces of corrugated cardboard are suitable for use with most smokers.

Don't push too much air from the bellows, just enough to get the smoke moving into the hive.

Too much pressure will irritate the bees before the smoke can soothe them.

Sundries

Box cutter, duct tape, large zipped plastic bags for making bee feeders.

Hives

Your hives can benefit from giving the stand a slight downward angle so that any rain or other liquid drains easily away and doesn't cause damage or encourage fungus to grow in the hive.

Langstroth



This design was patented by Rev L. Langstroth in the 1850's.

His idea was to use frames which protected the comb on all sides and set the frames at the ideal distance for bees to move between the frames, 3/8 inch or 9.525 mm.

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This avoided bees filling wider gaps with comb and smaller gaps with propolis (bee glue). That means that the bees don't use propolis so much and the internal parts and cover are easier to handle.

It is the most common system in use today and very popular for commercial honey production. The flat-sides and rigid frames make them easier than other designs for transporting when pollinating crops are located far from the keeper's home.

Although the Topbar system has been widely adopted by beekeepers who avoid using chemicals in their hives, the Langstroth can be used by them as well.

You need some woodworking knowledge to build or fix this type of hive. If you don't have access to that knowledge, you should be better off buying your first hive rather than building it.

Needs regular maintenance.

TopBar

Simpler construction.

Designed for "natural" beekeeping methods.

Lets bees build comb their way.

Regular checks and maintenance essential.

Needs more care in cold environments.

Lifting required to add boxes. (See link in resources section for home-built hoist).

Warre

Can be built by people with basic woodworking skills.

The bees' environment is intended to be like nature.

Restricted or banned in some locations on the grounds that combs cannot be lifted and inspected to check for bee problems.

Usually need experienced user as mentor who can advise how to fix problems.

If these hives need to be transported for pollinating crops in other areas, then the keepers replace the usual peaked Warre roofs with flat metal covers until the hives are returned home.

Some users now always use flat roofs for their Warre hives and include frames without putting foundation in them.

Parts of the Hive

Below the base of the hive is the stand.

Base Board: This may be solid wood or a frame surrounding a screen. The screened board is called a Varroa screen. Bees carry mites into the hive.

Many of the mites drop off their host bee but then climb from the base board to the supers and find another bee host.

The screen is to stop them getting up to get a new bee. The mites die from lack of food. When you use a sticky sheet on top of the board under the screen, it ensures the mites stick there and you can see how many are getting into your hive.

Entrance Reducer: This is a flat stick with a gap in it which replaces the entrance supplied with the hive. This helps the bees protect their hive from raiding bees who try to rob them.

Rack: This is optional. It is frame enclosing wood strips separated by gaps which are intended to improve ventilation to the upper levels of the hive.

Not necessary for every keeper.

Supers: The lowest hive section is where the bees have their brood cells. Some use the same size sections for these and the honey which is stored higher up. Some keepers use different sizes for each, according to the habits and needs of the particular bee breed they have.

Langstroth Hives have frames right around each section. Most have a foundation in them in line with the originator's design.

But, many keepers who prefer to let the bees make their own sheets, don't put a foundation in their frames and let the bees produce it their way.

Queen excluder: This is a rack with holes which worker bees can get through but the queen bees can't. Situated between the brood and honey sections, it ensures that the queen only lays eggs in the brood section.

Outer Cover: Keeps the weather out and helps to insulate the hive.

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Installing Bees in Your Langstroth Hive

You need to have prepared everything so you have no delays when your bees arrive.

Ensure that the weather will be good for that day and be prepared to put it off to the next if there are bad conditions – your bees will be okay for one extra day but you will need to store the package in a cool, dry area where it will not be disturbed by people, animals or damp.

Fill an unused spray bottle with 1:1 sugar water and gently spray the screen on the package.

Make the solution fresh each day: 1 part cane sugar to 1 part water that has been heated and allowed to cool to room temperature.

Set up the hive stand.

Check these items at least a day before you will install the bees. Some parts or accessories may not fit with others, especially when they are from different suppliers.

It's worth doing a dry run a day early so you can get (or make) substitutes where necessary. All gear needs to be clean. Anything which contacts the hive needs to be contaminant-free.

Tools and accessories:

Protective clothing.

Duct tape. Box cutter.

Bee Brush.

Smoker, matches or lighter, fuel (torn-up corrugated cardboard)

The Hive:

Bottom Board.

Entrance reducer.

Frames to suit the body you use. These may be 8 or 10 frames.

They will usually have a foundation in them. If you are removing the

foundation from them, check the gaps between the frames are very close to $3/8^{th}$ inch so the bees will be comfortable.

Set the entrance reducer carefully in place.

Doing this at late afternoon will avoid the heat of the sun.

If it is still warm, mist some sugar-water *lightly* on the outside of the package.

Open the package.

Gently bump the package so any bees under the lid are dislodged and don't escape.

Brush any bees off the queen cage.

Open the queen package carefully.

Check that the queen is walking and uninjured.

If there seems to be any problem, have a second look so you can clearly explain your problem to the supplier.

Then, close everything up carefully.

Put the whole package in a cool, dark, secure place.

Contact your supplier.

If the queen seems healthy your next step is to attach the queen cage to a frame in the hive.

Some put a rubber band around a frame to secure the queen cage.

Then, they put the queen cage under the band.

They push the queen cage a couple of inches down so the other bees can reach and help the queen.

There is another way which needs no rubber band.

You remove the plug at the candy end of the queen cage.

Take a frame from the center of the hive. Hang the queen cage from its wire in the space where you took out the frame. After this is in place, you can lift the package and gently pour the bees around the queen cage.

Move quietly and gently through the rest of this process because the bees will be easily frightened.

Set up your feeder with sugar water and close everything up.

Replace any frames you removed earlier except where the queen cage is now.

Leave the bees to settle after what is a very traumatic experience.

Give them about five days to settle.

Most people installing their first package will get less crop in the first year but it will improve after that.

Getting Your Honey

When you get to the stage of reaping your share of the honey, you will be excited but you need to prepare well and do each step in a deliberate manner so you eat the most honey, minimize stress for yourself and the bees and avoid accidents which might hurt the bees, you, or the quality or purity of your honey.

You need to leave about 60 lbs of honey for the occupants of each hive to get through the winter.

You maybe disappointed with your first crop in your first year and when you are extracting honey from a new colony of bees.

But, you and the bees will do better each year as long as you follow all the steps.

Preparation

If you are not intending to buy your own extractor, you may be able to hire one from a local supplier or your beekeepers' group.

If your group does have some which members can hire, get your order in early.

Your other equipment includes an uncapping knife, uncapping fork and large, food-grade plastic buckets with lids.

The knife is heated electrically and used to remove the caps from the wax cells of honey.

The fork is sharp and used for lifting away the caps of odd cells which were missed with the knife.

Keep it handy through the harvesting season to open and check occasional cells for presence of Varroa mites.

A sieve is needed for ensuring that you remove any bits of cell caps or other rubbish from the honey.

New jars and lids are needed for any honey which you may seal.

It's a good idea for any you give away too.

Some keepers put escape boards between the board and honey supers so that the bees can move down to the brood section but cannot return to the honey area while you are harvesting.

The next step is to lift out a frame and brush any bees off it back into the hive.

Cover the frames to ensure their contents are not contaminated during transport to the clean room where you do the extraction.

Complete the extraction as soon as possible after starting the process.

Your extracting must be done in very clean conditions.

Cover anything which is not being used so that you don't have to try to clean spilled honey or the parts of it.

If you intend to sell any of it you will need to have your set-up inspected and probably have to pay for a license.

You will also have to produce labels with all the information specified by your local and state authorities as well as keeping records for tax purposes.

Why Join a BeeKeepers Club?

There are Beekeeper Clubs of all sizes in most large towns.

I strongly recommend that you find out about the clubs near you and visit each of them before you start spending money on bees and equipment, if possible.

If you cannot find a local club, scan the listings in the resource section of this book.

You can also check with your local library – they often have a register of all clubs and associations in the area.

It is worth while making the time to visit more than one club because you may find more people who have similar goals with their bees as you have.

Clubs have many advantages which may not be obvious on a single visit.

The collected wisdom of the members is a valuable resource.

Be careful about taking everything at face value, but respect everyone who tries to help you.

Some readers may be lucky enough to meet someone that is willing to show them some of the steps in getting up or maintaining the colonies.

It's very comforting to have actually seen someone do it and who is willing to answer your questions right then.

Most clubs have connections with businesses that sell beekeeping equipment and these links often provide special deals which aren't generally available.

Resources

Associations

U.K.

Scottish Beekeepers Association

http://www.scottishbeekeepers.org.uk/

Provides information on its site and also arranges classes and exams on beekeeping in various parts of Scotland.

Welsh Beekeepers Association

http://www.wbka.com/

Represents Members of Beekeeper groups throughout Wales.

Provides 3rd party insurance for Members.

Ulster Beekeepers Association

www.ubka.org/

Offers training courses at all levels and other benefits for registered members of affiliated beekeeper groups in Northern Ireland.

Bee Farmers' Association

www.beefarmers.co.uk/

Association for professional beekeepers.

The Natural Beekeeping Trust

www.Naturalbeekeepingtrust,org/

The Natural Beekeeping Trust promotes awareness of

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sustainable beekeeping provides information and links to courses and other resources.

U.S.A.

American Beekeeping Federation

www/abfnet.org/

From their site: The ABF is a national organization with over 1,200 members that continually works in the interest of all beekeepers, large or small, and those associated with the industry to ensure the future of the honey bee.

It provides information for beekeepers at all levels, supports members, provides publications and monitors related legislation.

Support Organizations

North American Pollinator Protection Campaign

http://pollinator.org/nappc/index.html

From their site: Started in 1999, the NAPPC's mission is to encourage the health of resident and migratory pollinating animals in North America.

The National Honey Board (NHB)

www.honey.com/

From their site: The National Honey Board (NHB) is an industry-funded agriculture promotion group that works to educate consumers about the benefits and uses for honey and honey products through research, marketing and promotional programs.

The ten-member-Board, appointed by the U.S. Secretary of Agriculture, represents producers (beekeepers), packers, importers and a marketing cooperative.

http://people.westminstercollege.edu/faculty/wdeutschman/contents/warrelift/warre-lift.html

Design for making a lift for sections of the Warre hives. Your use of this information is entirely at your risk.

Pollinator Habitat Garden

http://www.themelissagarden.com/index.html

41 acre ranch providing plants which attract bees and other pollinating creatures.

Your Bee-utiful Future

I wrote this book to help you start right on your beekeeping hobby.

Many people suggest that beekeeping is easy and a wonderful way to make some extra cash.

That depends on your level of involvement.

Many beekeepers do make good money from their efforts and those of their bees.

But, I have shown you there is an amount of work involved and, for many beekeepers, most of the rewards are in the health products and the time spent with the working bees and beekeepers!

Milton Bradford

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