



# Working with Honey Bees



**The 4-H Beekeeping project helps you learn about raising honey bees. Beekeeping offers many exciting educational experiences, from learning about bees and honey plants, to raising healthy bees and ultimately, producing honey and other bee products.**

This is the second of three 4-H beekeeping manuals. In the first, *Learning About Beekeeping*, you learn about bees and beekeeping: types of bees, the honey and wax they produce, plants that attract bees, beekeeping equipment and how to keep records.

This manual, *Working with Honey Bees*, guides you through acquiring a colony of bees and learning how to care for your beehive throughout the year. This includes basic beekeeping operations that result in the production of extracted, chunk or cut comb honey.

When you are experienced and knowledgeable enough in the basic care of a beehive, move on to *Advanced Beekeeping Methods*. These advanced topics include increasing the number of your honey bee colonies, increasing honey production, producing special kinds of honey and more about bee societies.

The directed experiences in this manual encourage hands-on learning. A knowledgeable mentor is a big help to anyone getting started with beekeeping because there is much to learn. Having a good understanding of the process before you start is important for your bees' health. You can enhance your learning by consulting online resources and attending a beekeeping association meeting to learn from others who raise bees.

This manual is intended to help you learn the following, and more:

- How to start and care for your first beehive
- More about beekeeping equipment
- The importance of keeping beekeeping records
- How to help others learn about beekeeping
- How to learn from other sources

Authors: Natalie Carroll, Greg Hunt, Krispn Given

Reviewers: 2006: Tom Turpin, Larry Segerlind. 2022: Amy Dodd, Jeff Monroe, Jacob Shuman, Mindy Wilkinson

Illustrations: Tom Kronewitter

Photos: Greg Hunt, Krispn Given and Tom Campbell

Editor: Nancy Alexander

Designer: Tim Thompson

Words in **bold** are defined in the glossary at the end of this manual.

Some of the information in this manual has been adapted from *Starting Right with Bees*, a publication by the editors and staff of *Gleanings in the Bee Culture* and the standard for many years. Although the book is now out of print, a wealth of information is available at the Bee Culture website ([www.bee-culture.com/us/](http://www.bee-culture.com/us/)). Their magazine, which has been published since 1873, and podcasts are recommended, especially for new beekeepers. You can find a wealth of information on their website and by signing up for the magazine.



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## The Value of Honey Bees

People value honey for its wonderful taste and as a healthier substitute for sugar and an important baking ingredient. It has been used for its antiseptic qualities in burn ointments and the preparation of medicines. Honey has been used throughout history in the production of wines, especially honey wine or mead, which is still popular in many parts of the world.

Honey bees are important in our food system because they pollinate many crops when collecting nectar to make honey. Pollination is critical to the food and agriculture industries because many plants must be pollinated to produce fruit. The United States Department of Agriculture (USDA) pollinators website ([www.usda.gov/pollinators](http://www.usda.gov/pollinators)) notes: "Pollination services from honey bees and other insects provide the backbone to ensuring our diets are diverse and plentiful with fruits, nuts and vegetables. There are over 100 crops grown in the United States that depend on pollination." Honey bees pollinate 75 percent of all crops and are responsible for at least 30% of the food you eat!

Many **species**, including bats, birds, butterflies, flies and wasps pollinate plants, but none of them do it as well as honey bees. Honey bees are used in agriculture because they are hard workers, visit only one type of flower on a particular trip and their beehives can be moved to areas where flowers need to be pollinated. Because of these special qualities, American crop producers rent millions of colonies of honey bees each year to pollinate their crops.



Honey bees also produce beeswax, another product with important uses. The cosmetic industry uses beeswax in the preparation of products such as cold cream, lotion and lipstick. Beeswax is a basic ingredient in many candles. Pharmaceutical manufacturers include beeswax in many salves and ointments. Dentists use it for impression wax. Foundries need it for molds in precision casting. Beeswax is an ingredient in many types of polishes for floors, furniture and shoes. Other uses include adhesives, crayons, chewing gum, inks, basketball moldings, ski wax, thread wax, ironing wax and bowstring wax for archery.

## Bee Stings

Honey bees sting if they think they're in danger. An important part of beekeeping is understanding and accepting that you are going to be stung from time to time. No matter how good a beekeeper you become, occasionally you will accidentally crush or disturb a bee. Or you may visit the hives when the bees are disturbed by a change in the weather, hunger or something else beyond your control. You may be stung as a result because the bees are trying to protect themselves.

The sting of a bee is a momentary discomfort for most people. It reminds us to slow down, be more careful and show greater respect for bees. But a bee sting can be life-threatening for some people. A serious reaction to stings is unusual, but a person may have difficulty breathing or another dangerous reaction after being stung. See a doctor immediately if you or anyone you are with has a reaction to a bee sting. Do not open a hive alone until you know how you react to being stung. If you are highly allergic to stings, you must be particularly careful when working with bees. See an allergist before you consider continuing with this project.

Experienced beekeepers know what to expect when they get stung and what to do to reduce its effects.

A sting always hurts, but you don't need to be afraid of the honey bee sting unless you are allergic to it. It will hurt a little whether it's a first sting or the thousandth. Only the worker bee stings, and her stinger is barbed, like a fish hook. When she pushes her stinger into your skin, it catches and pulls out of her body as she flies quickly away. The bee dies soon after it stings.

She leaves behind the barbed stinger attached to a poison sac in your skin, with part of her intestine often still attached. Scrape the stinger off your skin using a fingernail or hive tool. Then puff smoke from a smoker or rub dirt on the area of the sting. This covers the smell of the sting so other bees won't be disturbed. Swelling around the spot may last a day or so, and ice may reduce it. Odd as it seems, many beekeepers report that the more they are stung, the less swelling results. So, the good in being stung may be that it won't be as bad when you are stung again! (Taking an antihistamine after the sting can help reduce symptoms like itching and swelling.)

If your bees sting a lot even though you're careful not to be rough with them, it is best to replace the queen. This often causes them to become gentler, but it may take some time.

## Beekeepers' Associations

You can learn a lot from an experienced beekeeper in your area. Ask questions about obtaining bees, setting up your hive and apiary management. Visiting a beekeepers' association meeting gives you the chance to meet other beekeepers in your area, ask questions, and hear others' ideas about and experiences with honey bees. As you have probably found out, a beekeeper likes nothing better than to "talk bees!" You can find information on beekeeping associations at the American Beekeeping Federation website ([www.abfnet.org/page/states](http://www.abfnet.org/page/states)), or ask your advisor if a beekeeping organization meets near your home.



## Record Keeping

Keep a record of all your beekeeping activities. This will help you learn more about your bees, make good decisions in the future and help organize your beekeeping work. Keep notes on these topics:

- Hive notes
- Beekeeping equipment inventory
- Receipt list
- Financial summary (assets, inventory, labor record)

You can use the tables included with this manual or make your own. The tables include information about these topics, but you may want to add items of interest to you, such as where your bees collected their nectar, your advisor and your 4-H exhibits.

## Building Your Hive

This manual guides you through setting up and maintaining your own hive. You will learn what must be done to care for your bees throughout the year. Start with two hives of bees, if possible, so you have the backup resources of a second hive — brood, queen cells and honey — in case something goes wrong with the first one. One hive is usually enough for a new beekeeper, however, if keeping two isn't possible.

Beekeeping is easier to learn by working with a mentor or advisor who has kept bees for many years. Your mentor can help you decide what bees to start with, set up your hive, obtain your bees, install them and care for them. Subscribe to *Bee Culture Magazine* or *American Bee Journal* to learn more about beekeeping and current beekeeping topics of interest.

There is, of course, a big difference between reading about bees and actually working with them. You must show initiative and responsibility if your hive is to succeed. You'll make many decisions that affect your hive, starting with what kind of bees you want to work with, where to get them and where to place your hive. You have to inspect your bees regularly to make certain they are healthy and remain so. You need to decide when to feed your bees in the spring and fall, when there is danger of their swarming and when it's necessary to **super** the hive. You'll also need to know how much honey you can take from the hive and how to extract the honey.



You'll make many other decisions about your bees during the coming year. But don't worry, you aren't expected to answer all the questions on your own. Beekeepers with many years of experience still turn to other beekeepers for advice. Every beekeeper can vividly recall their first hive of honey bees: the problems, questions and mistakes they made with it. Turning to your beekeeping advisor often for suggestions and answers to your questions about your first hive will help you avoid the many mistakes others have made.

Once you have your own hive of bees, keeping records and looking to your beekeeping advisor for help and advice are especially important.

## Equipment

Work with your advisor when you start thinking about purchasing your beekeeping equipment. Many variables affect your apiary, and making informed decisions will help you get off to a good start. Some things you'll want to discuss are based on where you live, such as the recommended bee race, when and where to get your bees, and how much **honey flow** is available near your hive(s).

Other decisions are related to your preferences, such as how much of the work you'll do by yourself, size and type of hive frames, and the type of honey you want to extract (comb, chunk or liquid). Your advisor can help you make good decisions. Review the information in the first manual, and make a list of equipment you need for yourself and your beehive before you meet with your advisor so you can have a productive meeting. Then check in a beekeeping magazine or online for beekeeping supply sources and place your order. Order your hive parts and frames and have them put together and ready before you get your bees.

## Hive Location

Decide where to place your hive before your hive and frames arrive. Two primary considerations make a successful beehive location: access and protection. Try to choose a location as close to your home as possible. The closer the hive is to your house, the less time you'll spend traveling to and from your hive and the easier it will be to inspect it. Locating the hive near your home also makes it more convenient to access your beekeeping equipment. Beehives near your home are more protected and less likely to be vandalized by thoughtless people who find a beehive in an isolated area an irresistible target for rock throwing or shotgun blasts. Having the beehive close to your home or the home of some other responsible person provides greater security for the colony.

If you live close to neighbors, locate your hive where the bee's flight path to flowers does not bother others. Check for local ordinances or restrictions on keeping bees if you live in an urban area. Bees can do well on the scattered flowers in gardens, vacant lots and roadsides in a city or town, but it takes acres of honey plants to produce large quantities of surplus honey. State and local regulations may require you to locate your hives a certain distance from roads or property lines. Building a 6-to 8-foot fence will direct your bees on a higher flight path, above people's heads.



Do not locate your beehive where it is vulnerable to crop spray. Consider the location from a bee's perspective by walking the area, looking at maps or aerial views, and thinking about the surrounding area. Be particularly careful not to locate hives near agricultural fields that may be treated with pesticides toxic to bees.

Once you decide where to locate your hive, notify your state bee inspector of its exact location. You can find the inspector at <https://www.beeculture.com/united-states-apiary-inspectors/>. If your apiary isn't located near your house, post your name, address and telephone number prominently.

## Nectar

Carefully study available honey plants around your potential hive location. Honey bees get most of their nectar and pollen within a half-mile radius of their hive. They can travel from one to two miles on their collection trips depending on the terrain and prevailing winds, if needed. Bees need acres of honey plants to produce large quantities of honey. An orchard or crop fields with nectar-producing plants can be good choices as long as no bee-damaging pesticides are used on them. Some beekeepers move their hives during the season to take advantage of flowering plants that bloom at different times.

Tips from the out-of-print book *Starting Right with Bees* still hold true today. Honey flows may be major or minor, depending on the weather and which plants are blooming. Honey flows are minor, then major and then minor again in spring, summer and fall in the middle latitudes of the United States. They can occur continuously until winter in other parts



of the country. The spring season is marked by short and intense, though minor, nectar flows. Fruit trees in bloom and dandelions contribute enough nectar to stimulate colony build-up. The colony's peak strength usually coincides with the start of the mid-season or main honey flow — June, July and sometimes August — in clover regions. Most of the surplus honey must be gathered during the major honey flow. Fall flows from goldenrod, asters and other fall plants often provide bees with substantial winter stores.

Talk to your advisor if your bees aren't filling the frames with honey during the major honey flow. Moving your beehive a mile or two can make the difference between a good or bad crop. Drought, cold or very hot weather, however, affect honey flow and are out of your control.

## Water

Bees, like all animals, need a constant supply of water. A stream or pond in the vicinity of your apiary is best. A good water source is especially necessary for beehive(s) located close to neighbors' homes, or the bees may choose your neighbor's water faucet, children's wading pool or bird bath. You can avoid your bees becoming a nuisance to others by keeping a tub or pan of water near the hive if your bees don't have access to a nearby stream or pond.

Make certain that the water source has something in it like cork floats, bark or layers of crushed rock so your bees can land without danger of drowning. Always keep water in the tub, and your bees will learn to go only to that dependable source of water.

## Drainage

Choose a hive location with good drainage and no possibility of the hive sitting in water. Keep the hive off the ground using a hive stand or bricks, and tilt it slightly forward. This allows any moisture that may accumulate to run out the front entrance and also makes it easier for the bees to remove dead bees and waste materials.

## Sunlight and Wind

Bees seem to do best in a location that gets morning sunlight and afternoon shade. Provide light shade in hot climates. Sheds or sheltering trees should be used in hot, arid regions. Your bees likely need some shade during hot summer afternoons and protection from the cold north winds of winter if you live in a more northern region. Hives should have as much sunlight as possible, especially during the winter months. Face your hive toward the south, where the entrance has the greatest exposure to sunlight. If your location makes it inconvenient to place the hives facing south, face the hive to the east to catch the morning sun.

## Vegetation

Finally, think about the vegetation immediately around your hive location. Trees to the west or north provide valuable protection from winter winds. Keep the grass and weeds cut around your hive. This reduces fire danger and helps with ventilation, which the bees need to maintain the proper hive temperature.

## Quiz Yourself

- What special considerations must the backyard beekeeper with close neighbors make?

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- What should you consider when looking for your beehive location?

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- Bees need a constant supply of \_\_\_\_\_.