



4-H Beekeeping

Division II

Working with Honey Bees

Year in Project: _____

Date Started in Beekeeping II: _____

Name: _____

Club: _____

County: _____

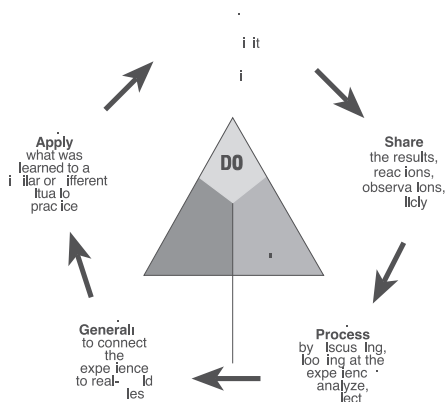
4-H Beekeeping, Division II: Working with Honey Bees

Note to Parents and Volunteer Leaders:

The 4-H Beekeeping project helps youth learn about raising honey bees. Beekeeping offers many exciting educational experiences, from learning about bees and honey plants to learning to raise bees and produce honey.

The 4-H Beekeeping Project is divided into three divisions. Division I, *Understanding the Honey Bee*, covers information on the basic facts of beekeeping: the types of bees, the honey and wax they produce, the plants that attract bees, and the equipment a beekeeper needs. In Division II, *Working with Honey Bees*, youth acquire a colony of bees and learn how to care for their beehive throughout the year. This includes basic beekeeping operations that result in the production of extracted, chunk, or cut comb honey. When the youth are experienced and knowledgeable enough in the basic care of a beehive, they should move on to *Advanced Beekeeping Methods*. The advanced topics include: increasing the number of your honey bee colonies, increasing honey production, producing special kinds of honey, and learning more about the bee societies.

The learning experiences have been planned to initiate “experience centered” activities. Youth are encouraged to take responsibility for their beekeeping projects. They can enhance their learning by consulting resources on the Internet, at school, and at the library, or by talking to someone who raises bees.



Experiential learning distinguishes 4-H youth development education from many formal educational methods. Activities are designed so youth experience a learning activity, reflect on what they did (explore the meaning of the activity), generalize what they learned (to test comprehension and appreciation of the activity), and then think about how they can apply what they learned to other situations (generalize). You can help guide youth as they explore each activity by discussing each section.

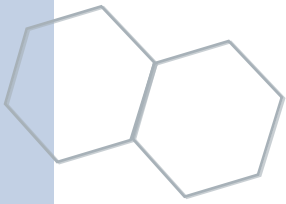
Purpose

Division II Beekeeping is intended to help youth learn many things, including:

- how to care for their own beehives,
- more about the equipment that a beekeeper needs,
- how to compile beekeeping records,
- how to present the results of their work to others,
- how to develop inquiring minds—the habit of asking questions and searching for answers.

Purdue University staff who contributed to this publication:

- Natalie Carroll and Greg Hunt
- Reviewers Tom Turpin and Larry Segerlind



Working with Honey Bees

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Working with Honey Bees

In Division I Beekeeping you learned about the honey bee and the equipment of the beekeeper from your manual and the book *The New Starting Right with Bees*. If you did not do Division I Beekeeping you might want to review the information in the manual. In Division II, we recommend you subscribe to a Beekeeper magazine such as *American Bee Journal* or *Bee Culture*, and you may want to get the book, *Honey Bee Biology and Beekeeping*. You will care for at least one beehive of your own throughout a full year's cycle of events. It might be better to begin with two hives of bees so you have the back-up resources of the other hive (brood, queen cells, honey, etc.) if something goes wrong with the first one. However, one hive is usually enough for a new beekeeper if keeping two is not possible.

There is a big difference between reading about the bees and actually working with them. When you work with bees, you must show initiative and responsibility if your hive is to succeed. You will have to make decisions about where to place your hive, what kind of bees to work with, and where to get them. You will have to inspect your bees to make certain that they are healthy and remain so. You will have to decide when to feed your bees in the spring and fall, when there is a danger of their swarming, and when it is necessary to “super” the hive. You will have to know how much honey you can take off of the hive and how to extract and market that surplus honey. If you make the right decisions in these situations, your bees will cooperate and produce a good crop of honey for you.

You will have many important decisions to make about your bees during the coming year. You are not expected to answer all of the questions on your own. Beekeepers of many years experience still turn to other beekeepers for advice when they must make difficult decisions. Now that you will have your own hive of bees, it is important for you to keep records and look to your beekeeping advisor for help.

Every beekeeper can vividly recall their first hive of honey bees: the problems, the questions, and the mistakes they made with it. If you turn often to your beekeeping advisor for suggestions, you will probably get answers for problems and questions you have about your first hive and avoid many mistakes that others have made. The first thing to do is to consult a beekeeping supply catalog. Once you have decided what you need, it will be necessary to get your hive parts and frames put together in time for your bees.

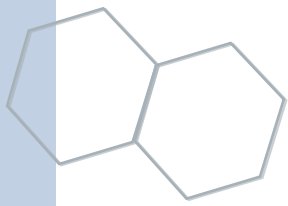
**NOTE:**

This manual, *Working with Honey Bees*, will help guide your beekeeping learning experience, but it's only one of many resources you'll need. Each section gives a brief introduction to a topic, then asks you questions. You will need to use additional resources to learn the things you need to know about beekeeping and to answer many of these questions. Your beekeeping advisors are the best place to start. They can discuss many of the topics with you and show you how to manage a beehive. They probably also have beekeeping books and journals that you can borrow.

If you are starting your own beehive, you should subscribe to a beekeeper magazine such as *American Bee Journal* or *Bee Culture*. Reading a journal helps you learn about beekeeping, current bee problems, and recommended solutions. Journals also will help you answer the questions in this manual. Order information for these and other resources are listed in the back of this manual (Resources). *The New Starting Right with Bees*, which you bought for Division I Beekeeping, will also have much of the information you need to start your beehive and answer the questions in this manual.



This symbol lets you know that you need to use outside resources to answer a particular question.



Selection of Location

The first decision the new beekeeper must make is where to put the hive. There are different factors that make a beehive location successful. There are also other questions about location to consider. For one thing, try to choose a location that is as close to your home as possible. There are several reasons for this. The closer the hive is to your house, the more convenient your storage area will be and the less time you'll spend traveling to and from your hive. If they are nearby, you will be able to inspect them more often.

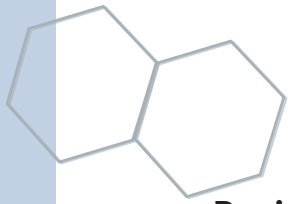
Occasionally, beehives are vandalized by thoughtless people who find a beehive in an isolated area an irresistible target for rock throwing or shotgun blasts. Therefore, having the beehive closer to your home or the home of some other responsible person provides greater security for the colony.

Nectar

You need to make a careful study of available honey plants around a potential hive location. Honey bees get most of their nectar and pollen within a half-mile radius of their hive location. However, they can travel from one to two miles on their collection trips, depending upon the ruggedness of the terrain and the prevailing winds.

Water

Bees, like all animals, need a constant supply of water. It is best if there is a stream or pond in the vicinity of the beehive. A good source of water is especially necessary if your beehive is to be located close to neighbors' homes. Otherwise, the bees may choose your neighbor's water faucet, the children's wading pool, or the bird bath for a source of water. To avoid having your bees become a nuisance, place a tub or pan of water near the hive, and your bees will learn to go only to that safe "watering hole." Make certain that the water source has something in it the bees can land on without danger of drowning, such as cork floats, bark, or layers of crushed rock.



Drainage

There must be some water near the hive, but not too much. There should never be any possibility of the hive having to sit in water. Therefore, look for a spot with good drainage. Keep the hive off the ground using a hive stand or bricks and tilt it slightly forward. This will permit any moisture that may accumulate to run out the front entrance. Leaning the hive slightly forward also makes it easier for the bees to remove dead bees and other waste materials.

Sunlight

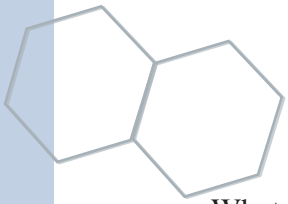
When locating your bees, also consider available sunlight. Your hives should have as much sunlight as possible, especially during the winter months. Face your hive toward the south, where the entrance will have the greatest exposure to sunlight and will be protected from the cold north winds of winter. If your location makes it inconvenient to place the hives facing south, try facing them 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. You will want to keep the grass and weeds cut around your hive. This will reduce any danger of fire damage and provide good ventilation, which is necessary for the bees to maintain the proper hive temperature.

Name factors to consider when choosing a hive location.

What are the advantages of placing your hive near a stand of trees?

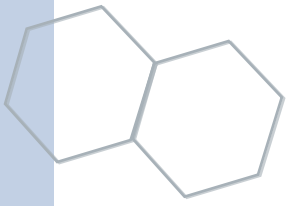


What special considerations must be made by the backyard beekeeper with close neighbors?

Can an area be overpopulated by honey bees? Explain.



Describe a perfect beehive location.



Getting the Bees

Now that you have assembled your equipment and chosen your location, it is time for you to obtain your bees. There are several methods for getting bees to fill your hive: catch a swarm, buy an already established colony, buy a package of bees, or find a beekeeper to sell you a “nucleus” colony. A “nuc” consists of several frames of bees, brood, and honey with a queen.

What equipment do you need to get started in beekeeping?

What is a swarm of honey bees?

Briefly explain the steps in hiving a package of bees.





Why is the queen in a cage when shipped in a package of bees?

Explain the “feeder can” method of feeding sugar syrup to your bees.



There are advantages and disadvantages to each of the methods for getting honey bees. Buying a “nuc” or nucleus colony is one good option if you can find a local beekeeper that sells them. This gives your colony a faster start than if you install a package, because you will already have drawn comb and brood. Also, a locally-bred queen may be better adapted to your weather conditions. Ordering a three-pound “package of bees” is another good method and it avoids some possible brood diseases. The beginning beekeeper learns a lot by observing the process of a package of bees developing into a full strength and producing colony.

Remember, if you plan to order a package of bees, do it soon enough so that it will arrive during April. It is best to start your hive in early April to allow more time for your colony to grow. Send in your package order as early as possible, preferably before the beginning of February. See the References section for more information about sources of bees.

Which race of honey bee do you want to get? Why?



What are the advantages and disadvantages of purchasing an established hive from a beekeeper?



Bee Diseases and Pests

Like people, honey bees can be affected by diseases and pests. Although the types and number of bee diseases are limited, they can be very serious. Table 1, Honey Bee Diseases, Pests, and Medications, lists some of the most common ones. If you have access to the Internet, go to the Purdue University Bee Hive site and read “Parasitic Mites of Honey Bees.” You can also find current information on pests of bees in journals, at beekeeper meetings, and at other sites on the Internet.

Always be aware that your bees could become infected by disease, but the chances are in your favor that they will stay healthy. Nosema disease is more common in Midwestern beehives than most beekeepers realize, but seldom is so serious that the hive is noticeably weakened. However, it can become a serious problem during the winter. American Foulbrood can pose a serious threat to bee hives, but the other brood diseases (European foulbrood, chalkbrood, and sacbrood) are “stress” diseases that usually can be cleared up by re-queening or just feeding sugar syrup. Bee pests include the wax moth, mites, ants, and mice. The Varroa mite is currently the worst problem in beekeeping worldwide. Mice are very destructive during the winter. Reduce the entrance size to decrease damage by mice. Some beekeepers use a 1/4 inch square wire mesh during the fall and winter to prevent entry by mice.

NOTE:

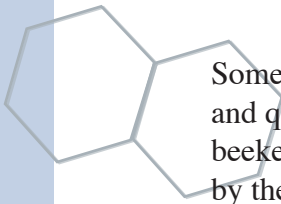
The information and suggestions in the publication are intended to provide guidelines for bee management. Table 1 is included to help you identify possible causes of problems. Control and treatment for some of the diseases and pest of bees may require the use of pesticides. If you think your bees have a disease or pest, ask your advisor for help in determining the cause and solution. It takes expertise and experience to learn about bee diseases and pests. Do not attempt to do this yourself, until you have worked with bees for many years. Use of some pesticides requires certification.

Because of changing laws and regulations, Purdue University Extension assumes no liability for these recommendations. The recommendations for using pesticides included in this guide are incomplete and should not serve as a substitute for pesticide labels. Complete instructions for the use of a specific pesticide are on the pesticide label. The pesticide user is responsible for applying pesticides according to label directions, as well as for problems that may arise through misapplication or misuse of the pesticide. Label changes, product cancellations, and changes in recommendations may have occurred since the publication of this guide. Check with your county Extension agent in agriculture if you are in doubt about a pesticide you plan to use. Trade names have been used in this guide for clarity, but do not constitute an endorsement by Purdue University, nor do they imply discrimination against other products.

Table 1: Honey Bee Diseases, Pests, and Medications

DISEASE	SIGNS	TREATMENT	CAUSE	METHOD
Diarrhea (Nosema)	Brown spots and streaks on hive box where bees come out.	Fumadil-B Providing good ventilation really helps!	A protozoan living in the bee's gut: <i>Nosema apis</i>	If it is a problem, treat package bees in spring with Fumadil in 1:1 sugar syrup. Treat hives with 2:1 sugar syrup in fall. Nosema can be a problem in winter
American Foulbrood	An uneven pattern of brood with lots of empty cells. Some cell cappings may look darkened and sunken. Cells may be partially opened by bees. Larvae die after cell is capped. You might smell something bad	Terramycin Destroy badly infected frames with scales of dead larvae by burning or discard in sealed trash bags. Usually none required. Some people use menthol crystals.	Bacteria: <i>Paenobacillus larvae</i> (= <i>Bacillus larvae</i>)	Not necessary to treat if there is no problem. Watch for symptoms and treat if needed. Sprinkle powdered sugar mixed with Terramycin according to the label instructions (3 treatments, 5 days apart)
Tracheal Mites	No obvious symptoms. Mites that are too small to see are inside the breathing tubes of the bees. In winter, infested bees may crawl out of the hive and die.	Usually none required. Some people use menthol crystals.	A mite: <i>Acarapis woodi</i>	No treatment needed. Most bees are resistant to tracheal mites. If your bees die in the winter, purchase queens from a different supplier.
Chalkbrood	Dead larvae become white or grey cottony "mummies" inside of cells. Mummies may be seen discarded by bees in front of hive. (cool weather problem)	Usually none required. Feed sugar syrup, add more brood or queen.	A fungus: <i>Ascosphaera apis</i>	No drug needed. Chalkbrood often clears up when weather improves or after a new queen is introduced to the hive.
Varroa Mites	Look for Varroa mites in capped cells (especially drone cells) or on adult bees. In bad infestations, you see an uneven pattern of brood with some dead brood. Some bees may have deformed wings. Eventually results in death of the colony, especially early winter kills.	Apistan strips (fluralinate) Checkmite+strips (coumaphos) Apilife VAR tablets (contains thymol oil)	A mite: <i>Varroa destructor</i> (= <i>V.jacobsoni</i>)	Check for Varroa spring and summer with sticky boards. Checkmite is very effective but is toxic and could harm developing queens. Apilife VAR is less toxic but more labor intensive. <u>This is the one bee disease that must be controlled!</u>
Wax Moths	Webbing in comb. Wax moth larvae bore right through bee brood and comb, leaving lines of dead brood and webbing. Can destroy good comb! This is a problem of weak or dead hives and stored comb.	PDB moth crystals (Paradichlorobenzene) are used in stored equipment only. Not moth balls! Bees usually control moths in colonies. Remove dead colonies.	Greater Wax Moth: <i>Galleria mellonella</i> is especially attracted to combs containing brood and pollen.	Stack hive bodies or supers and put a piece of newspaper on top. Place 1/3 cup PDB moth crystals on paper above every fourth box. Renew as crystals evaporate. Or kill moths by putting boxes in freezer.

Viral diseases are also important but there is no known effective treatment. Follow all label instructions.



Some bee diseases are highly contagious, spreading very easily and quickly. Even if you are an excellent and conscientious beekeeper with healthy bees, your hives could become infected by the bees from the diseased hives of some other beekeeper who lives several miles away from you.

Explain how honey bee diseases spread from hive to hive.

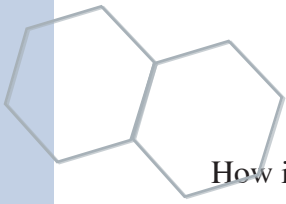
What are the signs of Nosema disease?

How would you protect your bees from Nosema?

What are the signs of American foulbrood disease?

Describe how American foulbrood can be successfully treated.

What is chalkbrood disease?

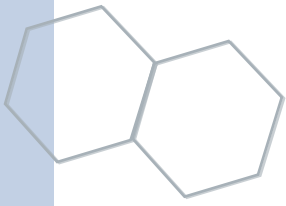


How is chalkbrood disease treated?

How would you know if your bees have Varroa mites?

What would you do to treat them for Varroa mites?

What is the best method of avoiding damage by the wax moth?

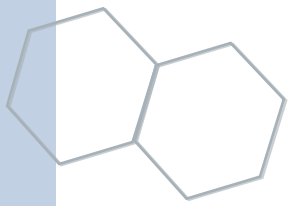


Beekeepers' Associations

By this time, you have learned the value of asking an experienced beekeeper any questions you have about your hive. Visiting a beekeepers' association meeting gives you the chance to meet other beekeepers, ask questions, and hear about others' ideas about and experiences with honey bees. As you have probably found out, there is nothing a beekeeper likes better than to “talk bees” with anyone!

You can find contact information for beekeeping associations at your Department of Natural Resources Web site and the Purdue Beehive Web site. See the Resources section for more information.

Your area may also have a local beekeepers' association. Such an organization is especially valuable because it offers an opportunity for more frequent meetings and greater cooperation among its members. Check with your beekeeper advisor or the Web sites to see if there is a regional organization near your home.



Seasonal Management Practices

It is important to keep good records. This will help you make decisions in the future and help you organize your beekeeping work. Use the sheets in this manual to help you keep records (inventory, receipts, financial summary, and labor records). You have now progressed to the heart of the 4-H Beekeeping Project: the maintenance of your own hive of bees throughout the year. The activities of your honey bees are determined to a large extent by weather and plant conditions, so it is easy to understand why there is a seasonal pattern to the colony's life. As the seasons change, so does the work of the bees.



Read Chapter 8, "Spring and Summer Management," and Chapter 9, "Late Season Management," in *The New Starting Right with Bees*.

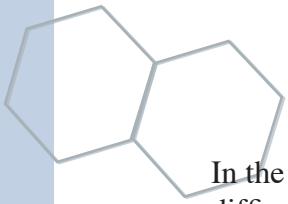
With the first warm days and blossoms of spring, the colony shakes off its winter drowsiness and perks up to begin the hectic work that will ultimately determine the ability of the hive to survive for another year. The interior of the hive is cleaned of winter debris, new comb is built, the queen begins laying eggs at an intense rate, and nectar and pollen are collected to feed the fast-growing population.

The nectar gathering increases in intensity, reaching its peak during the main honey flow of early summer. Throughout the remainder of the summer months, the field and house workers continue their chores of collection, storage, and feeding. Gradually the queen slows her job of egg production.

The bees use the clear, cool days of autumn to prepare for the harsh winter months ahead. The laziness and big appetites of the drones are no longer tolerated, and they are forced out of the hive. The honey supply is centralized in the hive for winter use. The queen limits her egg production even further.

Winter finds the colony clustered tightly together in the center of the hive. There the bees maintain their heat by mutual body warmth and by a very low level of activity, moving only when necessary to get more honey from the nearby storage cells.

You, the beekeeper, must respond to the seasonal needs of your hive. In fact, you need to keep one step ahead of your bees, helping prepare them for the next stage of their annual work cycle. By doing this, it is easier for your bees to work hard and productively.



In the spring, you must make certain that your colony survived the difficult winter months in a healthy, well-fed condition and that it is ready to begin its important spring work. You must decide whether to feed and medicate your hive. You also must make certain that your quickly expanding colony does not become overpopulated and swarm. Sometimes our bees swarm no matter what we do. You can reduce the swarming urge of the bees by providing enough room for your bees and removing queen cells. But don't remove all of the queen cells if the queen is missing or is not laying many eggs!

During the summer, you must always allow your bees enough supers for honey storage. You must help your hive through the hot, dry summer days by providing plenty of supers for storage space and by providing them with proper ventilation. You also must get your honey harvested early enough so that you have time to treat them for Varroa mites.

To help your bees prepare for winter, you will have to make certain that they have sufficient honey and that they are raising healthy brood. These will be the bees that must live all winter long! Also, properly sized hive entrances will keep mice out.

As your bees cluster during the winter months, you will need to prepare your equipment for the beginning of a new season. In the winter, you should stay out of your hive, opening it only briefly in an emergency when temperatures are at least 45 F.

The Beekeeper's Calendar (pages 21 and 22) will help you organize your work.



Summer and Spring

What flowers are important for the bees in your area?



When installing a queen in a hive, why is it important to keep feeding them sugar syrup?



What is “balling the queen,” and why does it happen?

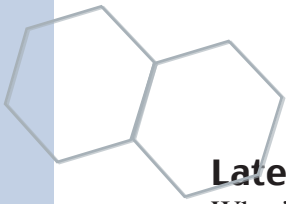


List indicators of swarming.



What is a play flight? What behaviors distinguish play fighting from robbing?





Late-Season Management

Why is it important to combine weak colonies with other hives?



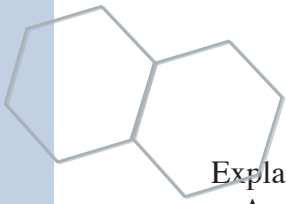
Experienced beekeepers recommend making certain that your colony is strong in the autumn so that you will not have to go through it during the winter. Why?

What is important to successfully overwinter your hive?

What are the benefits of top entrances in winter?



Why is it important to monitor food stores in spring or late winter?



Explain the old beekeeper's poem:

A swarm of bees in May
Is worth a load of hay.
A swarm of bees in June
Is worth a silver spoon.
A swarm of bees in July,
Let it fly.

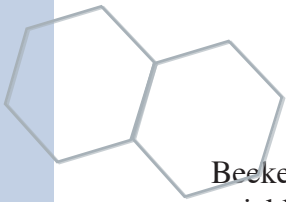
Does a young queen or old queen leave the hive with a swarm?

Why are swarms usually very gentle in nature?



How can a recently hived swarm be encouraged to remain in its new home?





Beekeepers say that if you want some comb foundation drawn out quickly into good frames of honeycomb, give it to a newly hived swarm. Explain.



What is the greatest advantage of using a double brood chamber system as the basic structure of your beehive?

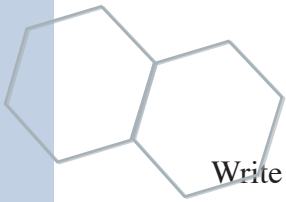


Why is it dangerous to feed your bees in the middle of winter?



Packing of hives is not recommended for Midwestern beehives. Why not?

What method have you chosen to control Varroa mites?

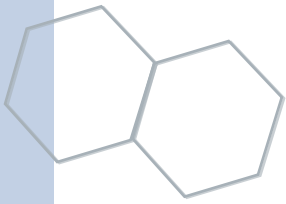


Write a paragraph describing in detail your experience in carrying out each of the following duties of the successful beekeeper:

Spring feeding to stimulate brood production.

Supering and other swarm prevention techniques.

Fall feeding and “taking the hive down” to prepare it for the winter months.



The Beekeeper's Calendar

January

- Perform emergency feeding with sugar candy or dry sugar on top of the inner cover, if necessary.
- Prepare equipment for coming season.



February

- Perform emergency feeding with sugar candy or dry sugar, if necessary.
- Develop an advertising program.
- Order package bees or nucleus hives.
- Prepare equipment for the active season.
- Clean up dead colonies.
- Begin spring feeding toward the end of the month or early in March.



March

- Order package bees and queens needed to replace those that are failing, or to make splits.
- Clean out entrances and bottom boards.
- Continue feeding sugar or syrup if colonies are empty.

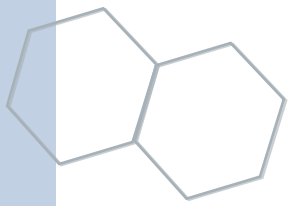
April

- Introduce package bees.
- Feed package bees syrup.
- Requeen colonies having failing queens.
- Split strong hives and requeen one half to prevent swarming.
- Reverse hive bodies on two-story colonies where the queen is only laying above.
- Check colonies for American foulbrood and Varroa mites.

May

- Add a super to each strong colony.
- Remove queen cells to prevent swarming (but make sure they haven't swarmed first!).
- Add another super if necessary.
- Provide a ventilation hole.
- Place queen excluder below shallow super on colonies for comb honey.
- Start to rear queens if you want to raise your own.





June

- Remove queen cells to prevent swarming.
- Replace defective combs with full sheets of foundation.
- Provide plenty of super space.
- Split hives to increase the number of colonies, if desired.
- Requeen toward end of month.
- Check colonies for American foul brood and Varroa mites.
- Remove comb honey supers when properly sealed.

July

- Add sufficient super space.

August

- Harvest honey supers when they stop filling up.
- With honey supers off, treat for Varroa mites.
- Extract clover honey.
- Remove section supers.
- Do not work bees too much, to avoid robbing.
- Perform fall requeening.

September

- Provide supers for fall flow, or let bees store it in brood nest.
- Check colonies for American foul brood and Varroa mites.
- Either put empty supers above the inner cover to let bees clean them, or let bees rob from the supers in the bee yard. Then store with PDB moth crystals.

October

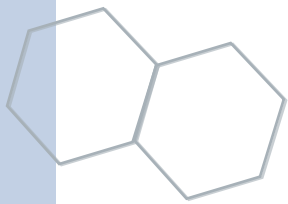
- Extract honey from fall flow.
- Put on entrance reducers or mouse guards.

November

- Complete late fall feeding if hives are light.
- Provide top entrance.
- Provide windbreaks.
- Develop a marketing program.

December

- Continue to develop your marketing program.
- Make equipment for extracting, bottling, etc.
- Read bee books.



Extracting Honey

If you learned well and followed the basic principles of beekeeping and if weather conditions were good, your bees should have produced more honey than they will need for the winter. This means you can take some for your own use. Be very careful, though, to leave plenty of honey for the bees to eat during the winter; leave them at least one brood chamber full of honey.

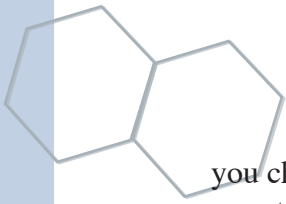
You can use the following method of removing honey from the comb if an extractor is not available and if you extract only a few frames of honey. Realize that this method is only practical for a limited amount of honey and, even then, it means the loss of the reusable comb. Cut the comb from the frame, and mash it in a kettle set in a hot water bath or double boiler. As the comb is gradually heated, the wax will melt and come to the top of the honey. Once the honey and wax are separated, cool the boiler, and lift off the wax. Then strain the honey through cheesecloth and allow it to settle overnight. By morning, it will be ready for bottling. Another method is to simply let the mashed comb strain through a stainless steel screen. This method avoids heating the honey too much, which can affect the flavor and color of your honey.

Certain pieces of equipment are necessary to extract honey properly from the comb. Perhaps you can borrow an extractor from your advisor. Without the proper equipment, extracting honey is a very time-consuming and difficult process. Also, it is inconvenient because, without the use of an extractor, the comb cannot be reused and new comb foundation will have to be provided each year.

If you decide to purchase an extractor, consider purchasing the following equipment:

- honey extractor
- settling tank
- uncapping knife (1 if electric, 2 if not electric)
- cappings scratcher
- jars, storage tins
- cheesecloth or stainless steel strainer

You can get a honey extractor, settling tank, and uncapping knife from any of the manufacturers of beekeeping equipment (see Resources). Purchase jars and tins from these companies, too, if



you choose to use a uniform bottling system. A steel strainer is easy to use. Try to find one that fits over your honey bucket.



What are the advantages of using shallow supers in the production of extracted honey?



How do you know when a frame is ready to be removed from the hive for extraction?

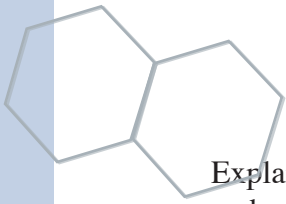


For the beginner, the brushing method of removing bees from comb is recommended. Describe the method.

Explain the purpose of the basic pieces of equipment necessary for the extracting process that you will use for your harvest.



Explain how an extractor removes the honey from the comb.

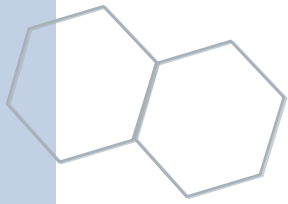


Explain why it is very important to maintain a weight balance and a steady, moderate speed while using the extractor to spin out the honey.



Explain the statement: “To produce chunk honey, you should use a light brood foundation, not wired. In the production of extracted honey, you should use three-ply foundation wired in the frames, or a plastic foundation.”





Bottling and Marketing Honey

You probably began your beekeeping work because you were interested in the honey bee and you liked outdoor work. However, by now you know there is money to be made in keeping honey bees. Honey is a valuable commodity. Its commercial value is increasing as more and more people realize the benefits of using honey. To make it profitable, a good beekeeper must also be a good business person, knowing how to package the product in an efficient and attractive manner and how to offer it to the public in an appealing way.

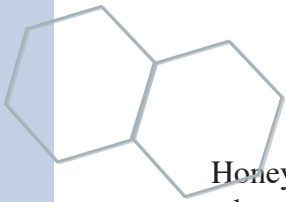
Market any surplus honey in one of three forms: extracted honey, chunk honey, or cut comb honey. Chunk honey is a piece of comb honey packed in a jar with liquid or extracted honey. Cut comb honey is a square of comb honey cut from a shallow, super-size frame of sealed honeycomb, then packaged in clear plastic.

This will give you a good background in the methods that can help make your beekeeping hobby a profitable business.

You will need labels for your jars of honey to describe the contents and to tell whose bees produced the honey. These labels should be as attractive as possible. All the bee equipment companies sell a variety of labels with space for you to write or stamp your name and address. Order enough of these labels or, better yet, design your own personalized label and have it printed for your use.

Define clarification of honey.





Honey does not have to be heated before it is sold. What are the advantages and disadvantages of heating your extracted honey? Tell whether you will process your honey by heating it.

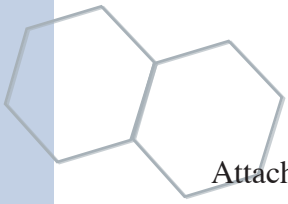


Explain the cause of cloudiness in honey and how to avoid it.



Describe several different possibilities for places to give or sell your honey.

Describe in detail your plan for marketing your honey.



Attach or sketch any promotional materials you designed.



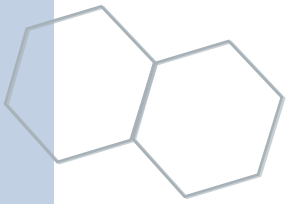
Inventory

List all of your beekeeping equipment.

Date Obtained	Item	Number	Cost
		Total:	

Receipts

Date Obtained	Item	Value (Used at Home)	Value (Sold)
		Total:	



Financial Summary

Assets:

Total value of bees, equipment, etc., on hand January 1	
Total value of supplies, equipment, etc., purchased during year	
Miscellaneous expenses (explain) during year	
Total:	

Inventory:

Total value of bees, equipment, etc., on hand December 31	
Total value of bee products available for sale December 31	
Total:	

Total pounds of honey produced:

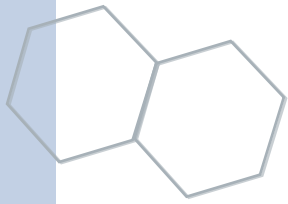
Value of bee products sold: _____

Yearly profit (or loss) = _____

Assets – Inventory + Value of bee products sold.

_____ - _____ + _____ = _____

Yearly profit/loss: _____



Labor Record

Record all time spent working on your beekeeping project.

Date	Kind of Work	Time Spent
Total:		



Demonstrations and Talks

Now that you are a working beekeeper, there is much about your craft that you could tell or show others. Use your imagination, and try to remember what fascinated you and what questions you had about honey bees before you began this 4-H project. Below is a list of possible topics for demonstrations or discussions. Use any of these ideas, or choose other interesting aspects of beekeeping to tell others about. An Action Demonstration on one of the following topics is an excellent way to teach others about bees.

- Selection of a good hive location
- “Going through” a hive
- Swarming and catching swarms
- Disease control
- The seasonal management of a beehive
- Extracting honey

Action Demonstration Guidelines

What is an action demonstration action demo?

An action demo is a fun way to share with others what you have learned in your 4-H project. It’s a kind of “show and tell” but with more action. An action demo is not like a regular demonstration, where the audience sits and listens to a prepared talk. An action demo lets the audience get involved.

Action demonstrations can be given anywhere there are a lot of people, such as a county or state fair, shopping mall, street fair, or any 4-H event. Your job as a demonstrator is to interest the audience in your topic so that they stop and learn something new or try their hand at what you are doing.

How do I choose a topic for my action demo?

An action demo can be on almost any subject. The topic should be something that you enjoy and are knowledgeable about. Consider the following questions when choosing a topic:

- Can you complete the action demonstration in 3—5 minutes?
- Can it easily be repeated over and over again to fill the assigned time?
- Is your action demo showing something that would interest the general public?
- Is there a good way to involve your audience in your action demo (“hands-on” or answering questions)?
- Can the supplies for the “hands-on” section be used over and over again, or will they need to be replaced? (Remember if the materials must be replaced, it will cost more to do the demonstration.)





How can I get the audience involved?

The first thing you need to do is be enthusiastic and attract people's attention as they walk by your table. You might have a colorful tablecloth or poster to spark their interest. You might ask them a question such as: "Would you like to play this game?" or "Have you ever made pretzels? Would you like to try?" The best way to attract their attention is having people around your table doing something. People love to do hands-on activities, so once you get a few people at your table, they will attract others. For more information on action demonstrations see V-4-H-28.

Involve your audience by having them:

- do what you are doing,
- do a "hands-on" section,
- judge the quality of various items,
- play a game, or
- answer questions.

Remember, the key to a good action demo is getting your audience involved.



Action Demo Checklist

Topic	Yes	No
Was the topic interesting to the general public, causing them to stop, watch, or participate?		
Did the topic stimulate questions from the audience?		
Was the topic of suitable length?		
Did the topic include something “hands-on” for the audience to do?		
Organizing the Content	Yes	No
Was the topic organized into short “show-and-tell” segments that were done repeatedly?		
Were segments presented in logical order?		
Were segments explained so that the audience understood why?		
Was it evident that the 4-H'er was knowledgeable about the subject and could answer questions?		
Did visuals, pictures, posters, or actual objects clarify the important ideas?		
Presenting the Demonstration	Yes	No
Did the 4-H'er seem enthusiastic?		
Did the 4-H'er encourage the audience to become involved in the demonstration?		
Did the 4-H'er speak directly to the audience?		
Did the 4-H'er show evidence of practice and experience?		
Did the 4-H'er show that she/he enjoys talking to the audience?		
Did the 4-H'er show enthusiasm, friendliness, and a business-like manner?		
Did the 4-H'er tell about what they learned through this 4-H project?		
Comments:		



Exhibits

You should get information about the 4-H Beekeeping exhibit from your county Extension educator. Indiana State Fair guidelines are available at the 4-H Web site (www.four-h.purdue.edu).

If you exhibit honey, judges will evaluate its color, body, flavor, aroma, uniformity of appearance, clarity, water content, and freedom from contamination. They will also evaluate the neatness of the container.

Resources

Recommended Magazines:

American Bee Journal

<http://www.dadant.com/journal/>

Bee Culture

<http://www.bee-culture.com/>

Recommended Book:

Honey Bee Biology and Beekeeping,

by D. M. Caron. Wicwas Press.

Cheshire, Connecticut. 1999. ISBN 1-878075-09-8.

Recommended Video:

A Year in the Life of an Apiary, by Keith Delaplane, University of Georgia.

1-800-359-4040

<http://www.gactr.uga.edu/tv/videocatalog/bees.html>

Purdue University Beehive Website

There are many beekeeping resources listed at the Purdue University Beehive site:

<http://www.entm.purdue.edu/Entomology/research/bee>



Choose “getting started” under “Beekeeping Information.” You will find links to Indiana beekeeping associations, general information sites, local suppliers, contacts, journals, sources for books, videos, and slides, and more! If you do not have Internet access, check your local library or visit your local Purdue Cooperative Extension Service office.

Note: If you do not have access to the Internet you can ask your county Extension educator to help you access this information. Many public libraries also have computers you may use.

Indiana Department of Natural Resources (IDNR)

The state apiary inspector is employed by the Indiana Department of Natural Resources (IDNR, <http://www.in.gov/dnr/>), Division of Entomology and Plant Pathology, and is located in Indianapolis. The Apiary News & Information Web site has a variety of information for the beekeeper, <http://www.in.gov/dnr/entomolo/apiary/apiarynews.htm>.

Topics at the Web site include:

- beekeeping meetings
- Indiana apiary regulations
- applications for shipping bees and elements of beekeeping into Indiana
- assistance for beekeeping in - (State Apiary Inspector, Purdue bee specialist, beekeeping associations, etc.)
- plants attractive to native bees
- links to Purdue bee publications
- links to state and federal programs and services



Glossary

Afterswarms – Swarms that leave a colony with a virgin queen after a swarm of the same season has already left the hive.

American foulbrood – An extremely contagious disease of bees that affects them in the larval (worm) stage of development caused by the bacteria *Bacillus larvae*.

Apiary – A collection of colonies of honey bees; also, the yard or place where bees are kept.

Apiculture – Beekeeping.

Bee escape – A device to remove bees from supers or buildings; constructed to allow bees to pass through in one direction but to prevent their return.

Beehive – A box or other structure for housing a colony of honey bees.

Bee space – An open space (1/4 to 3/8 inch) that permits free passage of a bee but too small to encourage comb building.

Beeswax – The wax secreted by honey bees from eight glands within the underside of the abdomen and used in building their combs.

Bee veil – A wire screen or cloth enclosure worn over the head and neck for protection from bee stings.

Bottom board – The floor of a beehive.

Brace comb – Small pieces of comb built between combs and the hive.

Brood – Young developing bees found in their cells in the egg, larval, and pupal stages of development.

Burr comb – Small pieces of wax built upon a comb or upon a wooden part of a hive but not connected to another comb or part.

Castes – The different kinds of adult bees in a colony: workers, drones, and queen.

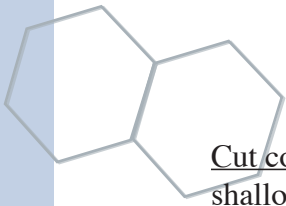
Cell – A single compartment in a honeycomb in which brood is reared or food is stored.

Chunk honey – A piece or pieces of comb honey packed in a jar with liquid extracted honey.

Clarification – The removal of foreign particles from liquid honey or wax by the straining, filtering, or settling process.

Cluster – The hanging together of a large group of honey bees, one upon another.

Colony – A community of honey bees having a queen, thousands of workers, and (during part of the year) a number of drones.



Cut comb honey – Squares of honey in the sealed comb in which it was produced; cut from a shallow super size frame of sealed honeycomb and then packaged in clear plastic.

Drifting – The return of field bees to colonies other than their own.

Drone – A male honey bee.

Dysentery – A disease of honey bees causing an accumulation of excess waste products that are released in and near the hive.

European foulbrood – An infectious disease affecting honey bees in the larval (worm) stage of development; caused by the bacteria *Streptococcus pluton*.

Extracted honey – Liquid honey.

Extractor – A machine using centrifugal force for removing honey from the comb without destroying the combs.

Field bees – Worker bees, usually at least 16 days old, that leave the hive to collect nectar, pollen, water, and propolis.

Foundation - Used to form base on which bees can construct complete comb, made of either wax or plastic.

Frame – Four strips of wood joined at the end to form a rectangular device for holding honeycomb.

Granulated honey – Honey that has crystallized, changing from a liquid to a solid.

Hive – Worker bees available for purchase. As a verb, to put a swarm in a hive.

Hive body – A single wooden rim or shell that holds a set of frames. When used for the brood nest, it is called a brood chamber. When used above the brood nest for honey storage, it is called a super.

Hive cover – The roof or lid of a hive.

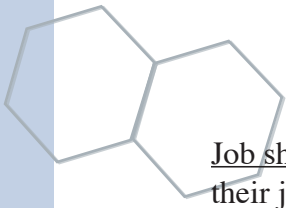
Hive tool – A metal tool with a scraping surface at one end and a blade at the other; used to open hives, pry frames apart, clean hives, etc.

Honeycomb – The mass of six-sided cells of wax built by honey bees in which they rear their young and store their food.

Honey flow – A time when nectar is plentiful and bees produce and store surplus honey.

House bee – A young worker bee, 1 day to 2 weeks old, that works only inside the hive.

Inner cover – A thin wooden board placed just beneath the hive cover for added protection and insulation from the elements.



Job shadowing – Learning from others by following, watching, and studying what they do in their jobs.

Larva – The grublike or wormlike immature form of the honey bee in its second stage of metamorphosis

Metamorphosis – The series of stages through which an insect passes: egg to larva to pupa to adult.

Movable frame – A frame of comb that can be easily removed from the hive. It is constructed to maintain a proper bee space, which prevents the bees from attaching comb or fastening it too securely with propolis.

Nectar – A sweet liquid secreted by plants, usually in their flowers, and converted into honey by bees.

Nosema – An infectious disease of the adult honey bee that infects the mid-gut, or stomach. It is caused by a protozoan parasite. Symptoms of this disease closely resemble those of dysentery.

Observation hive – A hive made mostly of glass or clear plastic to permit observation of the bees at work.

Pesticide – A general name for materials used to kill undesirable insects, plants, rodents, or other pests.

Pollen – Dustlike grains formed in the flowers of plants in which the male elements are produced. Honey bees use pollen as a protein food for their young.

Proboscis – The tongue of a honey bee.

Propolis – A kind of glue or resin collected by the bees for use in closing up cracks, anchoring hive parts, etc. It is also called bee glue.

Pupa – The third stage of a developing bee, during which it is inactive and sealed in its cell. The adult form is recognizable during this stage.

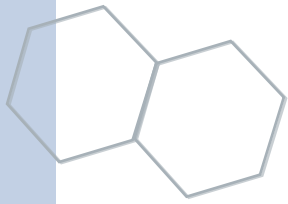
Queen excluder – A device, usually constructed of wood and wire or sheet zinc, having openings large enough for the passage of worker bees but too small for the passage of larger drone and queen bees.

Robber bee – A field bee from one colony that takes, or tries to take, honey from another colony.

Sacbrood – A slightly contagious disease of brood that is caused by a virus.

Sealed brood – Brood, mostly in the pupa stage, that has been capped or sealed in cells by the bees with a somewhat porous capping of wax.

Section comb honey – Honey in the sealed comb that was produced in thin wooden frames called sections.



Smoker – A device that burns slow-burning fuels to generate smoke for the purpose of keeping the bees calm while working in their hive.

Solar wax extractor – A glass-covered box for melting down beeswax by the heat of the sun.

Super – A receptacle in which bees store surplus honey placed “over” (above) the brood chamber. As a verb, to add supers in expectation of a honey flow.

Supersedure – rearing a new queen to replace the mother queen in the same hive

Swarm – A large group of worker bees, drones, and a queen that leaves the mother colony to establish a new colony.

Travel stain – The darkened appearance on the surface of comb honey when left in the hive for some time; caused by bees tracking propolis over the surface as they walk over the comb.

Uniting – The combining of two or more colonies to form one large colony.

Virgin queen – An unmated queen.

Wax moth – A moth whose larvae feed on and destroy honeycomb.

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