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Package Bees

*for Honey Production
and Pollination*



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CONTENTS

Package Bees:

Types of Packages.....	3
Ordering Package Bees.....	3
Preparation and Care Upon Arrival.....	4
Installing the Bees.....	5
Care of the Package Colony.....	7
Replacing Winter-killed Colonies with Package Bees.....	9
Strengthening Weak Overwintered Colonies.....	11
Bee Notes.....	12

Acknowledgment

Front cover photo by Walter Lauffer.

The Correspondence Course in Bee Culture

This home study course has been a leader for several years. There are 12 lessons in the course, covering the principles of bee behavior and various phases of successful modern apiary management.

Further details may be obtained concerning this correspondence course by writing to the Office of Information and Educational Aids, Agricultural Extension Service, The Ohio State University, Columbus 10, Ohio.

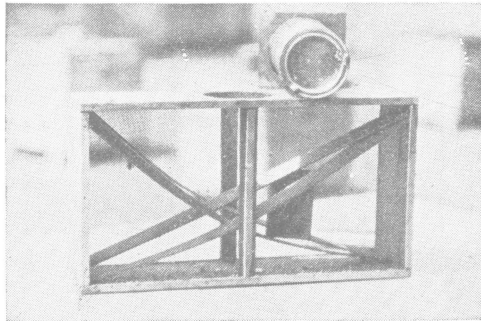


Fig. 1. A shipping cage for package bees.

Package Bees

for Honey Production and Pollination

Production of package bees is a branch of the beekeeping industry developed in the Gulf States and sections of California, because colonies there reach normal strength several weeks before those in the north. This offers a convenient source of bees for the beginner, replacing winter losses, making increases, strengthening weak colonies, and supplying bees for the pollination of deciduous fruits and certain vegetables grown under glass.

Package colonies usually make their best showing in sections of Ohio where sources of nectar are from mid-summer and fall plants. Elsewhere they usually make only a fair to medium return in honey production.

Package Types

Such bees are available in two types of packages—combless and with comb. The *combless* package is the most popular because of its adaptability to meet most conditions. Packages contain 2, 3 or 5 pounds of bees confined in a screened wooden shipping cage with a food container of sugar syrup. The queen usually is placed in a standard mailing cage and suspended in the center of the package. Three-pound packages generally are recommended for Ohio conditions. Five-pound packages are used largely for pollination purposes in the deciduous fruit industry.

All shipping cages are of standard dimensions so they may be placed within a regular hive-body. The top, ends, and base are wood with the sides covered with wire screen. Thin wooden slats sometimes are inserted diagonally to provide support for clustering. A No. 3 tin can containing syrup is inverted and suspended in the top of the cage. This furnishes food through several tiny holes in the lid for the bees while in transit. When packages are transported by air the feeder-can is eliminated.

The *comb* package is a nucleus consisting of one or more frames of emerging bees, brood, honey, adhering bees, and a queen. Frequently an extra pound or two of bees is added. This package is favored by the northern honey producer, who either maintains apiaries in the south or contracts with a package producer to establish the bees in furnished equipment. The additional cost does not justify the use of this package by the beginner or ordinary beekeeper.

Ordering Package Bees

It is a two-fold advantage to order package bees several weeks before the desired date of arrival. Then the purchaser is reasonably sure of receiving the bees promptly. Shippers also are in a position to provide prompt service and better values by carefully planning operations. The ideal time for receiving and installing packages is at the beginning of the fruit or dandelion bloom. Then

there usually is an abundance of pollen and nectar available, which enables the bees to start brood-rearing with little delay. For the most experienced beekeeper, packages may arrive as early as April 1 in the southern half of the state and about 5 to 7 days later in the northern half. Research and observations indicate that it requires approximately 10 weeks for a 3-pound package to reach a population of maximum strength for production of surplus honey.

Preparation and Care Upon Arrival

Since it is essential to install the bees with the least possible delay, definite preparations should be made well in advance. Inform the local express agent of the shipment and request immediate notification of arrival. Inform him of the necessity of placing the bees in a cool, dark place until they are claimed. If the bees are extremely active or restless, they should be given water or a thin syrup. Sprinkle or spray this directly into the cage and repeat until the cluster forms a rather compact mass. Then, until installation, place the bees in a cool, dark room or basement where the temperature is 55 to 60°F. Having the hives on location and materials in readiness eliminates confusion and expedites installation.

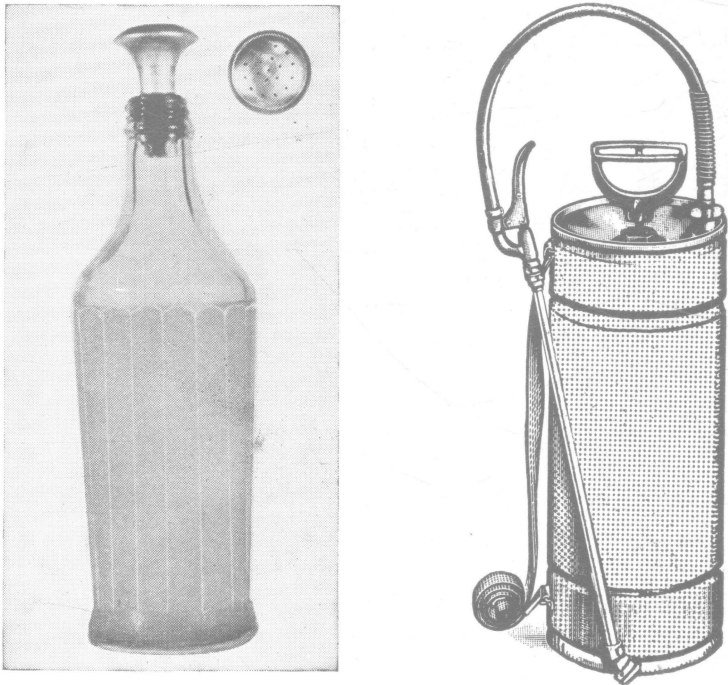


Fig. 2. Devices for feeding bees with sugar sirup. Left, bottle with special stopper; right, small tank sprayer.

When bees are installed on drawn combs, or in hives which were previously occupied, it is necessary to be certain that the colony was not infected with American foulbrood. Otherwise this will mean the loss of the bees. Hives with combs containing a liberal quantity of pollen with two or three frames of honey are ideal for the introduction of package bees. If drawn combs are not available, frames with full sheets of foundation may be substituted. When the weather is cool the installation may be done at any period of the day; otherwise, the best time is late in the afternoon or early evening.

An hour before installation, transfer the cage to a location where the temperature is about 70°F., and feed the bees a sugar syrup of equal parts granulated sugar and water. The ideal procedure is to sprinkle or spray the syrup directly on the bees until they appear rather wet or form a quiet, compact cluster. In this condition, they are less likely to fly, besides having time to become organized after installation. It is necessary to reduce the hive entrance to at least $\frac{3}{8}$ x 1 inch.

Installing the Bees

Since the introduction of package bees to the industry, many procedures have been suggested regarding the proper means of transferring the bees to modern hives. Probably the easiest method is to place the package within the hive and permit the bees to move directly onto the combs. This can be accomplished with little confusion and drifting of the bees by removing four frames from one side of the hive and setting the prepared package in the vacant space. Then pry off the lid, lift out the feeder can, and pull out the small rectangular wooden cage containing the queen. This usually is attached to a wire, which has been tacked to the top of the package under the lid.

Carefully examine the queen to determine her condition. The end compartment containing the candy is covered either with heavy paper or occasionally with a small piece of metal. This is removed and a small hole about the size of a match stick is punched through the candy. The queen cage with the candy end up can be suspended between the second and third frames opposite the opening of the package. If the weather is cool (40 to 50°F.) and there are indications that temperatures may continue so for a few days, the queen cage should be suspended next to the package.

Some operators prefer to lay the queen cage with the screen side down on the top-bars between the second and third frames directly opposite the opening of the package.

It is well to dip out the equivalent of two or three handfuls of bees over the cage, to attract the bees from the package to the cage containing the queen and give her protection. The inner-cover is replaced with the rim side down. A "pepper box" feeder of warm syrup is inverted over the opening of the inner-cover. This is surrounded with an empty hive-body covered with the outer-cover. "The "pepper box feeder" consists of a 5- or preferably 10-pound friction

top nail filled with syrup of equal parts of granulated sugar and water. The syrup should be brought to a boil and allowed to cool to about 90°F. before it is placed over the bees. Six to a dozen holes, about the size of a No. 3 shingle nail, are punched through the lid. It is necessary to replace this lid securely before it is inverted — in which position the food will be accessible to the bees.

More experienced beekeepers may prefer to install the bees directly from the package into the hive. This is accomplished by removing eight frames from the center of the hive. Bees in the package are sprayed with a thin syrup until they appear quite wet. Then remove the feeder-can and queen and jar the bees to one end of the package. Cut the screen at the opposite end to permit quick shaking of the bees onto the vacant space on the bottom board. Spread out the bees and replace the frames. The cage containing the queen is given the same treatment, as mentioned in the preceding method of transferring, and suspended in the central area of the hive. The inner-cover is replaced and the feeder applied as previously described. After the bees have been installed either on foundation or drawn comb, it is necessary to keep a constant supply of syrup in the feeder until nectar and pollen are available in the field.

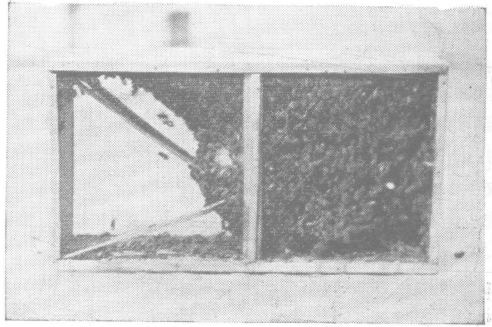


Fig. 3. Bees gorged with sugar sirup form a quiet cluster.



Fig. 4. Examining the queen to determine her condition.

Care of the Package Colony

Six days after installation, examine the colony to determine its condition. If the package was placed inside the hive it should be removed. Then push the

frames to the center of the hive and fill in the empty space with frames of full sheets or drawn combs. Carefully check the combs, where the cluster has become established, to determine if the queen has started egg-laying. If eggs are present and deposited in a regular compact manner, the queen is in normal condition, and brood-rearing will progress quite

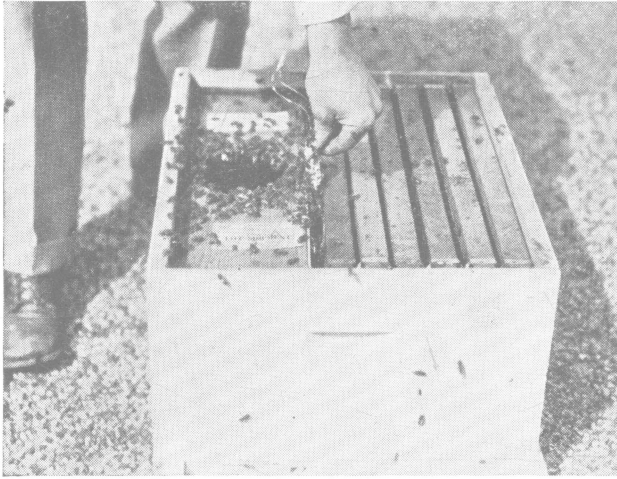


Fig. 5. Correct position of queen cage during cool weather

rapidly. If no eggs are present, it indicates one of several conditions. If the queen has not been released, slightly enlarge the hole in the candy and replace the cage in the same direction. If the queen has been liberated, it is possible she has not yet started egg-laying; or she may have been injured or was not accepted. Close the hive and examine for eggs 4 or 5 days later. If none are present, it is a fair indication the queen is either disabled or dead. In either

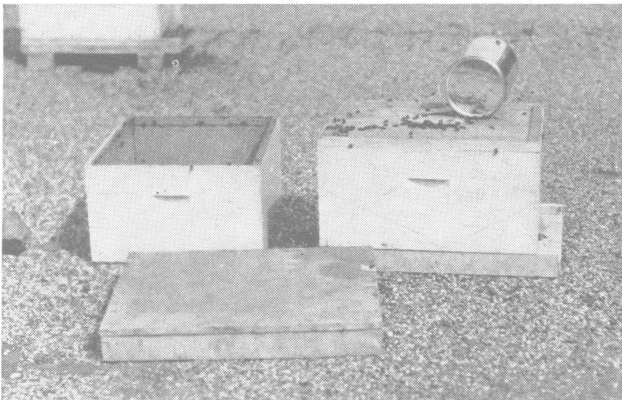


Fig. 6. Package colony in position to receive sirup from the friction top pail feeder inverted over bee escape opening; hive body and outer cover to be placed over inner cover of the colony.

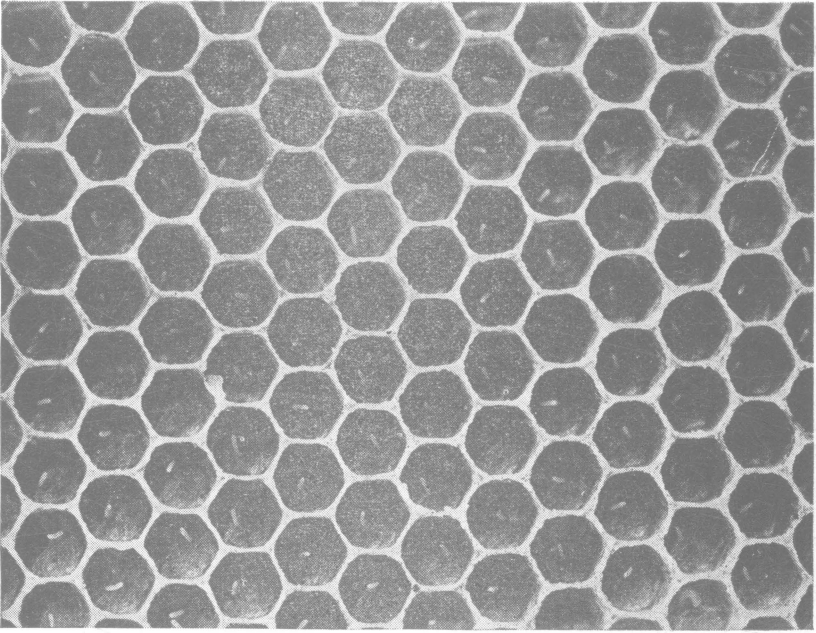


Fig. 7. Close view of eggs deposited compactly in the comb.

case, a new queen should be ordered at once. Usually, shippers will replace injured, dead, or inferior queens such as drone layers.

About two weeks after installation, it is well to make a check on the condition of the first brood. If the surface of the cappings is rather even with each cell just slightly raised, the queen is normal. If cappings over the cells show an unevenness, appear bullet-shaped, or have a pronounced convex form, the queen was improperly mated and is laying unfertile eggs. Such queens should be destroyed and replaced with a new queen.

The critical period in the progress of the package usually occurs about 3 weeks after it has been installed. Then the adult bee population is at its lowest ebb, and brood-rearing is at a relatively high point, placing the colony in a possible unbalanced condition. Frequently, at this period, the bees attempt to supersede the queen. Supersedure in package colonies is a problem often caused by inferior queens or frequent handling of the new colony.

In addition to providing a constant supply of syrup, it is a good practice to supply a pollen substitute. A good formula for preparation consists of 1 part brewers yeast—of the animal type—and 4 parts of expeller-process soybean flour moistened with a heavy sugar syrup—3 to 4 parts of sugar to 1 part water. Thoroughly mix until it has the consistency of a medium stiff dough. Place a pound over the top-bars directly above the brood. Feed the substitute until natural pollen becomes available.

Sometimes when weather conditions are favorable for bee-flight and nectar secretion, the bees store it in combs adjacent to the brood, thereby preventing any expansion of the brood-nest and causing what is understood to be "honey bound." This condition is likely when drawn combs are used in installing the package and usually occurs during fruit or dandelion bloom. In order that the queen may have adequate comb space for egg-laying, it is necessary to correct this "honey bound" condition by interchanging the frames of honey with the empty combs or foundation next to the sides of the hive.

A common error by the beginner usually is the addition of the second hive-body too soon for the needs of the colony. This action retards rather than stimulates brood-rearing. Normally the colony does not require the second hive-body until the sixth or seventh week after installation, or when the bees cover most of the combs in the first hive-body. When adding the second hive-body, take two frames of brood from the lower body and place them in the center of the upper body. Push the remaining brood combs in the lower body to the center and fill the empty space with frames removed from the top hive-body. This manipulation permits the queen to expand her egg-laying activities over a greater area and relieves any congestion which might occur if the brood was left in the single story. Later if most of the brood-rearing activity is in the second hive-body, they should be interchanged. When nectar is coming in quite freely, a third hive-body should be added.

For additional information concerning colony management, consult Extension Bulletin 254, "Bees for Honey Production and Pollination."

Replacing Winter-Killed Colonies with Package Bees

Occasionally exceedingly heavy colony losses occur late in the winter or early spring because of adverse weather and other contributing factors that happened late in the preceding season. Such colonies may be replaced by package bees, thereby quickly restoring bee populations which otherwise normally would require several years. Even if a package colony should not produce as

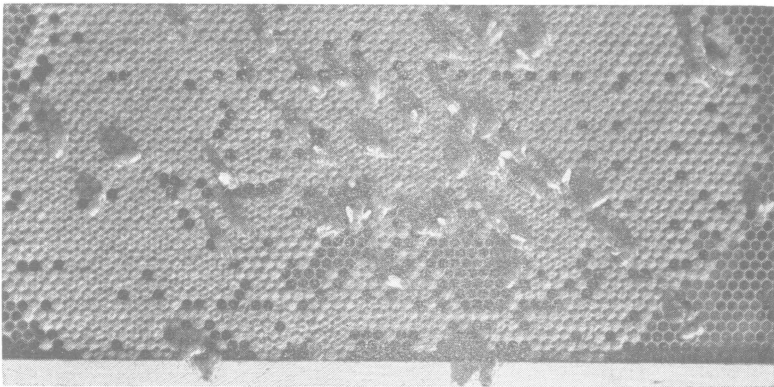


Fig. 8. Characteristic appearance of capped worker brood.

much honey as a good over-wintered colony, it keeps equipment in production. Idle equipment is expensive. Besides, it deteriorates rapidly.

Generally such hives have honey and pollen in sufficient quantity for the immediate requirements of the bees. It is necessary to clean the hives thoroughly by brushing out the dead bees clinging to combs and removing all refuse from the bottom board. The entrance must be reduced to a small opening and retained until a larger one is needed for free flight.

While there are many procedures for installing packages, the spray and the direct queen release method of package introduction are most economical for commercial beekeepers. Not only does it require less labor, but it also permits queens to begin egg-laying earlier than the ordinary cage release method. By this method, the bees in the package are sprayed at several intervals before installation. Eight combs are removed from the center of the hive to provide space for shaking the bees. Just before this operation, the bees are sprayed again with syrup until they appear quite wet to prevent flight. The cluster is jarred into one end of the cage and the screen is cut to allow a quick shaking into the hive. The queen is then sprayed with syrup and released with the bees by pulling the screen from the cage. Bees then are spread out on the bottom to allow replacing the frames without injury to the bees.

Some operators prefer releasing the queen directly onto the combs. The hive is covered and left for 3 or 4 days when they can be examined if they are manipulated with extreme care. Good vigorous queens usually begin to lay within 24 hours, and the new colony progresses rather rapidly. The principles of management for replacement of bees follow the same procedure as over-wintered colonies.

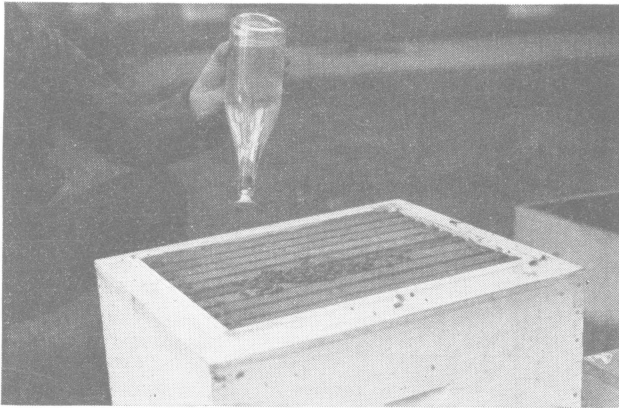


Fig. 9. Sprinkling bees in a weak colony with sugar sirup; a necessary procedure when uniting queenless package bees to a weak colony.

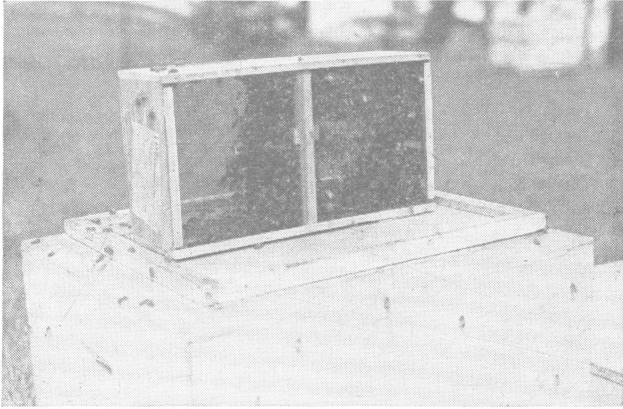


Fig. 10. Uniting a queenless package of bees to a weak colony by inverting package over bee escape opening in the inner cover. An empty hive body is set on the colony with outer cover replaced.

Strengthening Weak Overwintered Colonies

Frequently in early spring there are colonies with a small worker population, but which appear normal in all other respects, having a well-balanced supply of pollen reserves, honey, adequate comb space for egg-laying, and a vigorous queen. Such colonies can be restored to normal producing units by adding a 2- or 3-pound package of queenless bees. Otherwise they may have to struggle to produce sufficient honey to meet their own needs.

Weak colonies are a liability rather than an asset. For best results, weak colonies should be strengthened during early April by introducing 2 pounds of queenless bees to each colony which covers approximately two to three frames of comb.

Queenless packages can be united easily by preparing both the colony and the package by spraying or sprinkling the bees rather liberally with sugar syrup. The inner-cover from the weak colony is removed, and the syrup is sprayed or sprinkled directly over the tops of the frames occupied by the bees until the bees appear quite wet. The inner-cover is replaced, and the bee escape hole is left open. The bees in the package are sprayed with syrup using care not to wet them too heavily. The lid is pried-off the package, the feeder-can removed, and the cage is inverted with the opening over the hole in the inner-cover. An empty hive-body is placed over the inner-cover, and the hive closed with the outer cover. About 24 hours later, carefully remove the cage and the empty body. Examination of the colony should be delayed for a few days.

Bee Notes

About nine times during the year, the condition of colonies, honey plants, seasonal management procedures in the apiary, etc., are discussed in a mimeographed circular known as "*Bee Notes.*" This is issued, free upon request, by the Agricultural Extension Service of The Ohio State University. Apply at your county agent's office, or write to the Division of Bee Culture, Botany and Zoology Building, The Ohio State University, Columbus 10, Ohio.

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