

Beekeeping and Honey Production

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Introduction

Apiculture, the study and keeping of bees, often begins as a hobby, later expanding into a small business. A beekeeping enterprise can provide marketable honey and serve as a source of pollinators for nearby cultivated crops.

Market and Market Outlook

The honey market is currently very strong, especially for locally produced honey and specialty honey. A beekeeper producing a quality product can easily sell out before the next season's crop is ready. Honey produced from the nectar of certain trees, such as tulip tree, sourwood, and basswood, often brings a premium price.

Market options include farmers markets, health food stores, roadside stands, agritourism sites, and Kentucky-crafted stores or booths. Beekeepers producing large crops may consider selling honey in bulk to a honey packer.

Honey can be marketed in several forms. **COMB HONEY** consists of chunks of honey-filled combs taken directly from the hive. Because it is the easiest to produce and the cheapest to package and market, comb honey is often recommended for beginning beekeepers. While the price is not as high as for other types, there is usually a ready market. **EXTRACTED HONEY**, which is generally preferred by most consumers, is the liquid portion once it has been separated



from the comb. Specialty products such as honey butter and whipped honey are made from extracted honey. **CHUNK HONEY** is a combination of comb honey and extracted honey bottled together.

The U.S. imports a substantial amount of **BEESWAX**, a secondary product of bee activity. Market potential persists for quality, domestic beeswax. The beekeeping industry, which uses beeswax to form wax foundation for the frames in the hive, is one of the largest users of this by-product. There is also a high demand for pure beeswax candles.

ROYAL JELLY, a substance secreted by worker bees to feed the queen, and **BEE POLLEN** (more accurately, "bee-collected pollen"), are being promoted as dietary supplements. Royal jelly production can be expensive and



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labor-intensive with limited markets. However, collecting pollen is simple; with a little knowledge about collection and marketing, bee-collected pollen may bring a premium price.

Renting out hives to orchardists and farmers for pollination purposes can provide another source of income. In addition, experienced beekeepers could consider selling bees to other beekeepers. These are sold as a small nucleus hive, or “nuc,” that is easily transported and later expanded to a full-size hive. Selling queens is another way experienced beekeepers may profit from their enterprise. The technique for rearing queens is taught in workshops at Kentucky State University.



Production Considerations

Site selection and obtaining bees

Ideally, hives should be located within 1 to 2 miles of a succession of spring, summer, and fall nectar sources. While previous guidelines indicated that hives need to be located in a shaded area, the latest information suggests that it is best to place them in full sunlight to help combat the small hive beetle. A source of water, such as a dripping hose, should be located nearby. Avoid locations near large rivers, highways, public areas, or on hilltops. Hives should be protected against cold winter winds. Hives located near cultivated crops are potentially in danger of exposure to insecticides. Obtaining the cooperation of the grower and/or pesticide applicator will be essential to avoid bee losses.

Bees can be captured from a swarm, obtained

from an established beekeeper, or purchased from a commercial bee supply company. Along with the hive and hive parts, other necessary equipment includes a smoker, hive tool, and protective gear for the beekeeper.

Sources of honey

Honey color and flavor are determined by the various plant species visited by the bees. It is not economically practical to produce a crop solely for honey production; however, cultivated plants grown for other purposes can provide an important source of nectar. Common nectar sources include agricultural crops, tree fruits, small fruits, ornamentals, and wild flowers. One hive will require several acres of flowering plants to provide it with sufficient nectar.

Management

The beekeeper will need to regularly open each hive to examine the condition of the brood, check food stores, look for signs of disease and pests, and to perform various hive maintenance tasks. The queen should be replaced every other spring or at the first signs of failure, regardless of age. While some inspections can be brief, it is important that the hive be examined in a timely manner throughout the year.

Swarming, which greatly reduces hive strength, is most often associated with overcrowding in the hive. It can be avoided with proper management practices.

Pest management

The most common brood diseases in Kentucky are chalk brood, American foulbrood, and European foulbrood. Other diseases include Nosema and, occasionally, some viruses. The Varroa mite and tracheal mite can result in serious bee losses in the hive. The small hive beetle is a widespread pest in Kentucky. Recent successes in bee breeding have provided strains of bees that are mite-resistant and disease-resistant. Obtaining bees and queens from a reputable source, frequent inspections, and proper management helps prevent bee losses.

Skunks and mice are common in rural areas, but can be excluded with screens or other barriers at the front of the hive. Bears, which are now common in eastern Kentucky, are kept away with electric fences.

Harvesting and processing honey

Honey is considered ripe when the bees cap the honey. Supers, the chambers used to store surplus honey in the hive, can be removed from the hive once they are completely capped over. The average yield in Kentucky is about 50 pounds of honey per hive per year. The honey should be processed soon after harvesting and then stored in sealed containers in a warm, dry place or in a freezer until marketed.

Pieces of sealed and undamaged honeycomb can be cut into neat pieces, packaged in plastic wrap or boxes, and sold as comb honey. Liquid honey may be separated from the combs using professional extracting equipment. Small-scale beekeepers, however, can do the job cheaply by crushing the combs and letting the honey run slowly through strainers. Extracted honey is packaged in clear glass or plastic containers. Chunk honey is prepared by placing a portion of honeycomb in a jar and filling up the rest of the jar with the extracted liquid honey.

Beeswax is collected after all honey has been removed from the combs. It should be cleaned, melted down, and strained. It stores well at room temperature in the form of large chunks.

Labor requirements

Labor needs for beekeeping and honey production are quite variable. For example, the time spent establishing new hives will depend on materials used. In addition, considerable time can be spent simply driving between hive locations. While it is difficult to estimate exact labor times for caring for bees and harvesting, beginning honey producers should expect to spend at least 28 hours per year managing 2 hives. Labor time per hive should decline somewhat with experience and as more hives are added.

Honeycomb processing times will vary depending on the type of honey produced. Producers should expect to spend about an hour per hive processing comb honey. Additional time will be required for further processing.

Economic Considerations

Initial investments include the purchase of hives, beekeeping equipment, bees, and queen. The Kentucky Department of Agriculture suggests budgeting a startup cost of \$500 for two hives, and \$175 for each additional complete hive.

Pressing or extracting equipment will represent an additional investment for producers of chunk and extracted honey. The least expensive honey extractors with associated equipment cost about \$500. However, extractors can be borrowed from other beekeepers and some local beekeeping associations make them available to members. A grant from the Kentucky Agricultural Development Board to Kentucky State University has allowed the construction of a number of large-capacity honey extraction units. These units have been established at selected County Extension offices around the state.

Producers wishing to purchase their own extraction equipment and enter larger-scale honey production will need at least 40 hives to recoup the typical costs of extraction equipment in 3 years or less. For producers wanting to invest in extraction equipment but wishing to keep fewer hives, a 10-hive production and extraction system would require an initial investment in the \$4,000 range; a 50-hive system would require an investment approaching \$6,000. There are definite economies of scale and cost savings realized by keeping more hives for the purpose of extraction. Based on a price of \$2 per pound, extracted honey producers using this complete system could realize returns to land, labor, and management exceeding \$100 per hive, provided hives are rented for pollination at an annual rate of at least \$60 per hive. Recent retail honey prices up to \$7 per pound in Kentucky could create

significantly greater returns for well-managed honey operations.

Producers of comb honey will need at least one year of production to cover the cost of hive materials. This will be realized in the second year of keeping hives since the first year is devoted to building up hives for winter survival and producing a honey crop on the following year's nectar flow. At a price of about \$2 per pound of comb honey, a 10-hive comb honey system can yield returns to land, labor, and management exceeding \$50 per hive for honey production and returns exceeding \$125 per hive when hives are also rented out for pollination. Direct marketing of honey and related products can substantially increase price per pound and profitability per hive.

Beekeepers selling honey in bulk to a honey packer can avoid the cost of bottling and marketing the honey in jars, but will obtain only \$2 to \$2.50 per pound for 55-gallon drums of honey. If local markets are available for bulk honey, savings on packaging and direct marketing costs can make bulk production attractive. There may be a local market for selling honey to other producers who have established accounts and need more honey.

Selected Resources

- Beginning Beekeeping for Kentuckians (University of Kentucky, 1996)
<http://www.ca.uky.edu/agc/pubs/ent/ent41/ent41.pdf>
- Honey Bee Program and Kentucky State Apiarist (KDA)
<http://www.kyagr.com/statevet/honeybees.html>
- Kentucky Beekeeper's Calendar (The Kentucky Bee Company)
<http://www.kybeeco.com/kentucky-beekeeping-calendar-of-events/>

- Kentucky Beekeeping — A Guide for Beginners (Kentucky State University, 2010)
4.9 MB file
http://www.kyagr.com/statevet/documents/OSV_BEE_BeekeepingGuide.pdf
- Kentucky State Beekeepers Association <http://www.ksbabeekeeping.org>
- Agricultural Alternatives: Beekeeping (Pennsylvania State Extension, 2012)
<http://pubs.cas.psu.edu/FreePubs/pdfs/ua310.pdf>
- American Beekeeping Federation (Georgia)
<http://www.abfnet.org>
- Beekeeping Enterprise Budget (Iowa State University Leopold Center, 2010) *1.3 MB file*
<http://www.leopold.iastate.edu/sites/default/files/pubs-and-papers/2010-03-alternative-enterprise-budget-beekeeping.pdf>
- Beeswax (Virginia Tech, 2001)
http://ruralnetwork.ca/sites/default/files/tools_resources/beeswax.pdf
- Honey (Virginia Tech, 2001)
<http://www.ntfpinfo.us/docs/other/VirginiaTech2001-HoneyFactsheet.pdf>
- Honey Bee Program (University of Georgia)
<http://www.ent.uga.edu/bees/>
- Honey Bees and Beekeeping (University of Georgia, 2010)
http://www.caes.uga.edu/Publications/displayHTML.cfm?pk_id=6165
- Income Opportunities in Special Forest Products — Chapter 10: Honey (USDA, 1997)
<http://www.fpl.fs.fed.us/documnts/usda/agib666/aib66610.pdf>
- Producing Pollen (University of Florida, 2003)
<http://entnemdept.ufl.edu/honeybee/PDF's%202011/producing%20pollen.pdf>

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Photos: David Cappaert, Michigan State University (bee on flower) & Carl Dennis, Auburn University (bees on comb), courtesy of Bugwood.org; and Stephen Patton, UK Ag Communications (honey jars)

For additional information, contact your local [County Extension agent](#)

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