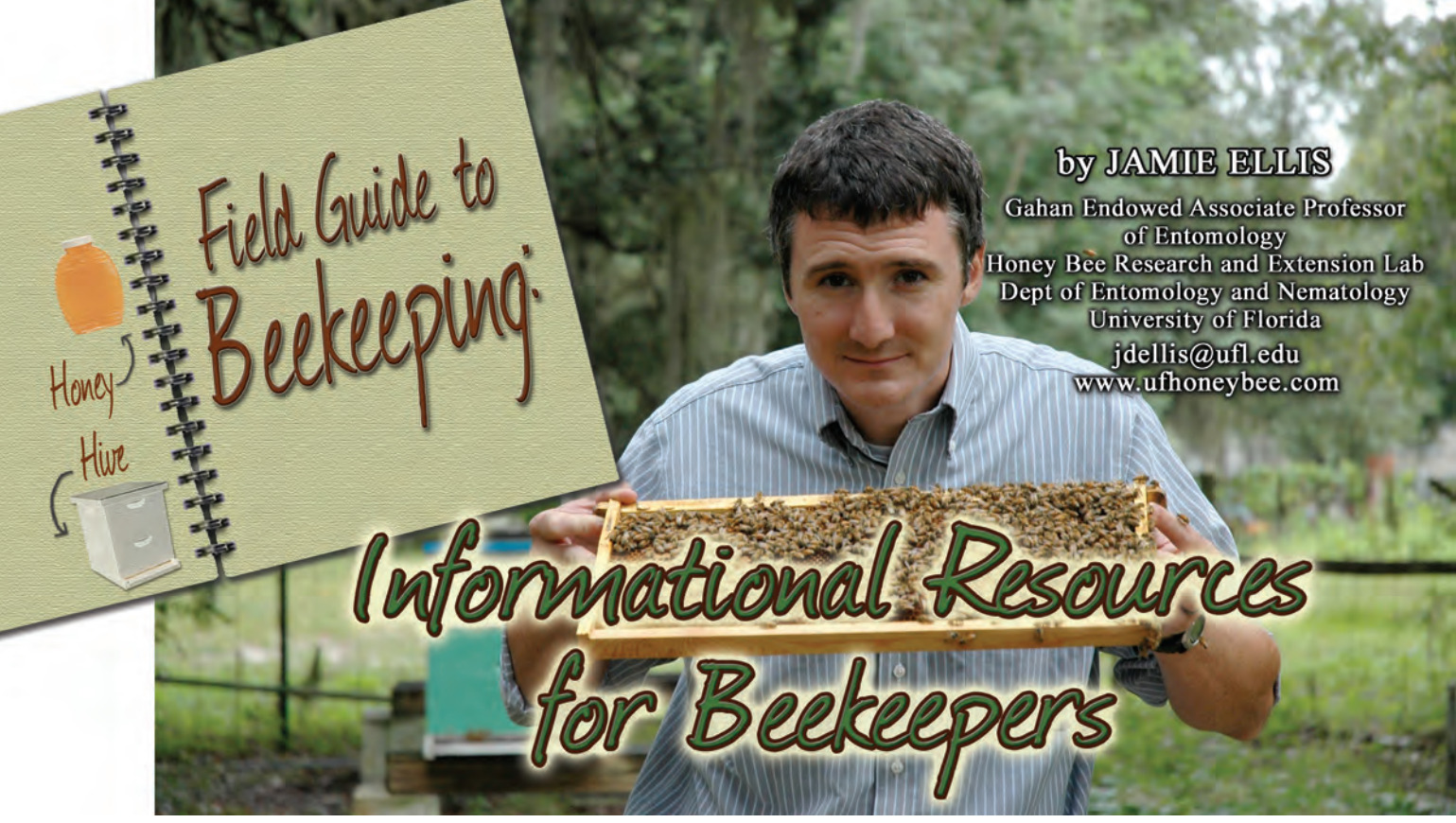

Informational Resources for Beekeepers

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There appears to be a growing interest in beekeeping in the U.S. Many people are getting into beekeeping as a hobby and livelihood. To give an example close to home, there were about 900 – 1,100 beekeepers in Florida when I began working at the University of Florida in 2006. Now, there are over 3,500 beekeepers. Of course, this does not account for the number of people who keep bees "off the grid" in Florida, but it does illustrate the point that more people are diving into this fascinating endeavor, perhaps more people than ever have.

Beekeeping is addictive. Bee fever is contagious. I have known so many budding beekeepers who jump into this hobby with little planning or consideration because of the craft's ability to capture its practitioners. There is a lot more to beekeeping than simply having a hive of bees from which you can harvest honey any time you want. One must have skill, knowledge, persistence, and a little luck to succeed at this craft.

Beekeeping is not easy. New beekeepers have to learn an entire new vocabulary, work with new tools, and become expert woodworkers, veterinarians, horticulturists, enterprising CEOs, marketers, biologists, and food safety workers. On top of that, beekeepers work with insects that most of the rest of the general public fear so much that they will drive off the road trying to get a trapped bee out of their car. I share all of this to ask a simple question: why would anyone get into this hobby/profession without being prepared or having a robust support network from which one can get help/advice? Yet, people do all the time. It is not uncommon for me to see people purchasing 50 colonies, without ever even working one before.

Do not hear me wrong; I want people to get into beekeeping. I love keeping bees. My involvement with bees has brought me considerable personal and professional satisfaction. However, I feel that it is important for all beekeepers, new-bees and experienced beekeepers alike, to be aware of the resources available to them so that they can maximize their beekeeping experience. It is with this goal in mind that I pen the following information.

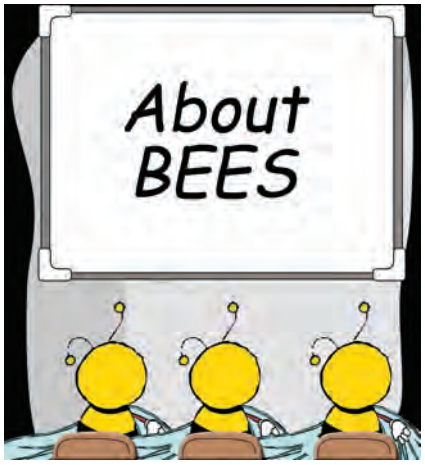
The purpose of this article is to provide a single source that can serve as a reference of resources for beekeepers. I list many of the types of resources available to beekeepers. I give some specific examples of each type of resource I discuss. My list of examples is not exhaustive. I apologize sincerely if I fail to mention a resource about which you are aware and use regularly. In fact, please let me know via email if my list is incomplete. I welcome the opportunity to expand the list.

A final precautionary note: please consider all information you read and hear about bees critically. I know of too many people who are taught erroneous information, never to let the information go. Hold your beekeeping conclusions lightly. Doing so may keep you from looking foolish. ☺

People and Organizational Resources:

(1) Mentors: It should be no wonder why I list mentors first. I consider mentors (other beekeepers) to be the best resource available to any beekeeper. Even lifelong, commercial beekeepers contact one another for ideas, the latest news on bees, to borrow equipment, to request help, etc. I think all beekeepers should have a mentor. Many, likely most, beekeepers get into beekeeping in the first place because they have (had) a mentor. My mentor's name was Joseph Miller and he spent time with me, teaching me how to work a colony, answering my questions, and just being available for help. He loaned me bee books, provided queen cells when my colonies were queenless, and had spare equipment on hand when I needed some. I found him to be an indispensable resource for me as I stumbled through my early years as a beekeeper. Like bees, and despite our individual personalities and nature, humans are made to be social. You will enjoy the beekeeping experience a lot more if you find someone who is willing to lead you and learn with you.

(2) Bee clubs (local, state, regional, national, international): Like the bees they study, beekeepers are remarkably well or-



ganized into a network of groups, clubs, etc. Bee clubs are groups of beekeepers who gather to discuss the latest issues, help one another with their beekeeping efforts, and generally promote the craft.

A – Local bee clubs – These are usually distributed within a state and can be found by looking up ones state organization online and visiting the "local clubs" information pages. Most beekeepers in the U.S. are likely within 1-3 hours of a local bee club. Most local bee clubs meet monthly or every other month. They often offer short courses and other training events. Another strength of local clubs is that the members can band together to purchase equipment that otherwise is difficult for a single beekeeper to purchase. For example, a local club may purchase an extractor and make it available for use to all of the members. Local clubs are a tremendous resource to all beekeepers. I highly recommend joining a local bee club if one is available in your area.

B – State bee clubs – Almost all states in the U.S. have a state-level beekeeping organization. Some even have two. State clubs perform many of the same functions as a local club, just at the state level. They often meet 1 – 2 times per year, with their meetings featuring notable beekeepers, bee scientists, and other speakers from around the state, country, and globe. State clubs can influence bee policy adopted at the state level. For example, they can lobby the state government to pass laws that benefit beekeepers and beekeeping. They can offer research grants, provide training, etc. I also think beekeepers should be members of their state beekeeping organizations.

C – Regional bee clubs – There are three "regional" beekeeping organizations in the U.S. They are (1) the Eastern Apicultural Society (**http://www.easternapiculture.org/**), (2) the Heartland Apicultural Society (**http://www.heartlandbees.org/**), and (3) the Western Apicultural Society (**http://ucanr.edu/sites/was2/**). These groups represent their respective regions in the U.S., often offering similar beekeeping opportunities offered by state clubs, though on a much larger scale.

D – National bee clubs – Many of the world's countries have national beekeeping organizations. There are two major national groups in the U.S. that beekeepers should know and use as a resource. These are (1) the American Beekeeping Federation (**http://www.abfnet.org/**) and (2) American Honey Producers Association (**http://www.ahpanet.com/**). Both groups produce a tremendous amount of resources for beekeepers and represent beekeeper interests at the national level. They meet yearly and offer stellar programs and services. I will note that other countries often have their own bee clubs, so it is worth investigating other countries' national organizations by doing some targeted internet searches for the clubs.

E – International bee clubs – As you might expect, there are international clubs of note. The most relevant for beekeepers is likely Apimondia (**http://www.apimondia.org/**) which bills itself as the "international federation of beekeepers' organizations and other organizations working within the apiculture sector." It is similar in function/purpose to other large beekeeper groups. Apimonida sponsors a major international meeting every other year, with countries from around the world vying to host the event. I have enjoyed attending Apimondia meetings. It is a great group with which to be affiliated, especially if international beekeeping is of interest to you, or if you like to travel to cool and interesting places.

(3) University Researchers: In the late 1800s, the federal government deeded land to each state that, in turn, used the land to create and endow land grant institutions or universities. Many, though not all, of these institutions became the large, public colleges in each state. For example, they include the University of Florida (where I work), University of Georgia, The Pennsylvania State University, The Ohio State University, University of California, Purdue University, etc. These universities were charged with the responsibility to teach, among other things, practical agriculture, science, etc. This teaching would not only occur in the classroom for degree-seeking students (a process called "instruction"), but it would also include taking research-based knowledge into the community (a process called "extension"). The extension service is based in land-grant universities and this service exists to provide cutting-edge, current information on a variety of topics, including beekeeping, to its clients, i.e. the state's residents. So, a great place to start to look for locally relevant information on honey bees and beekeeping is with one's land grant institution. If you do not know which institution that is for you, see: **http://www.higher-ed.org/resources/land_grant_colleges.htm**.

Not all land-grant universities have bee programs, though a lot do. Faculty at land-grant institutions who have responsibilities in extension are called "extension specialists". A number of my colleagues around the country have these responsibilities. Resultantly, they (1) are available to answer questions related to bees, usually through email or by phone, (2) speak at bee clubs within each state and around the U.S., (3) develop fact sheets, circulars, websites, videos, etc., (4) conduct applied research to address specific bee management issues, (5) offer specific programming related to bees (such as Master Beekeeper Programs, field days, short courses), and (6) do a whole lot more! Much of the information they develop flows to beekeepers through the land grant universities' county extension offices present in most counties in the U.S. These offices are headed by county agents (or faculty) who are, by design, the first contact for many beekeepers needing information related to the craft. If the county agents cannot answer the question(s), they contact the state faculty (extension specialist) who attempts to assist. This hierarchy was/is designed to provide locally relevant, research-vetted, unbiased information to clients, i.e. beekeepers. All beekeepers should know their closest extension specialist. Extension specialists exist to help.

There are a number of other researchers/professors who explore basic science topics using honey bees as their model organism or system. They often, though not always, work at non-land grant universities or colleges. These individuals are responsible for a lot of our basic understanding of honey bee biology, ecology, genomics, etc. They can serve as a valuable resource for beekeepers and usually can be found using web searches targeting their programs. Many of the nation's bee scientists belong to the American Association of Professional Apiculturists: **http://aapa.cyberbee.net/**. This group meets yearly, usually in conjunction with one of the national beekeepers' associations.

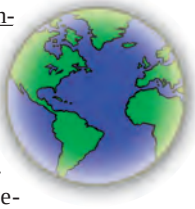
(4) USDA Bee Labs: The United States Department of Agriculture maintains three laboratories related to honey bee research. They are: (1) the Carl Hayden Bee Research Center in Tucson, AZ (**http://www.ars.usda.gov/main/site_main.htm?modecode=53-42-03-00**), (2) the Bee Research Laboratory in Beltsville, MD (**http://www.ars.usda.gov/main/site_main.htm?modecode=12-45-33-00**), and (3) the Honey Bee Breeding, Genetics, and Physiology Research Laboratory in Baton Rouge, LA (**http://www.ars.usda.gov/Main/site_main.htm?modecode=64-13-30-00**). The multiple scientists at each lab have different mandates related to honey bee research. They work on topics that are of immediate relevance to beekeepers, thus making their respective teams and the information they produce great resources.

(5) Apiary Inspection Programs: Some states have apiary inspection programs and these often are run out of the respective state's department of agriculture or land grant universities. For most of the states, the apiary inspectors have responsibilities in more subjects than just bees; so they may not be able to provide direct, technical assistance with beekeeping-related questions. Other states, Florida for example, have dedicated apiary inspectors who only work with bees. Regardless, apiary inspectors can be a great resource for beekeepers. The inspectors often are available to answer questions, inspect colonies (usually in search for American foulbrood), and provide beekeeper training. It is important that you determine if there is an apiary inspection program in your state. Some states, like Florida, require you by law to register your colonies with the inspection program. There is a national association of apiary inspectors: the Apiary Inspectors of America (**http://www.apiaryinspectors.org/**). Their purpose and offered resources can be found at their website. This group meets yearly, usually in conjunction with one of the national beekeepers associations.

(6) Beekeeping equipment manufacturers/providers: Of course, there is an entire set of equipment, supplies, and tools that are unique to beekeeping. They are developed, produced, and sold by equipment manufacturers/distributors. These companies are staffed with extremely knowledgeable people who are always willing to help. In fact, many of these companies host beekeeping field days, produce and provide their own beekeeping information deliverables (such as pamphlets), and will send you an equipment catalog upon request. The latter is especially useful because equipment catalogs serve as pictorial dictionary of the equipment beekeepers use. I almost hate to begin a list of beekeeping equipment supply companies at the risk of omitting a lot of them. So, I will just note a few of the bigger ones with which many beekeepers are familiar. They include Dadant and Sons, Inc. (**http://www.dadant.com/**, also publisher of the *American Bee Journal*), Mann Lake Ltd. (**http://www.mannlakeltd.com/**), Walter T. Kelley Company (**http://www.kelleybees.com/**), Brushy Mountain Bee Farm (**http://www.brushymountainbeefarm.com/**), and Rossman Apiaries, Inc. (**http://www.gabees.com/**).

(7) Package bee/queen/nuc providers: Similar to the equipment manufacturers/providers, package bee/queen/nuc providers are a great source of information about honey bees and beekeepers. Of course, they exist to sell beekeepers their goods, but they usually are really good at providing advice to beekeepers upon request, especially related to their products and starting new colonies. They are too numerous to list, but there are likely dozens of these individuals who offer these services in each state. You can find out about them from your state beekeepers' association.

(8) Bee Informed Partnership (BIP): The public face of this initiative is a website found at **http://beeinformed.org/**. Basically, the BIP is an extension project ultimately designed to reduce the yearly number of honey bee colony deaths (called "losses" by the BIP team). Those involved in the program collect data from bee colonies and operations around the country and look for emerging trends that (1) help explain colony losses and (2) can suggest management techniques to minimize colony losses and improve colony health. This program is a resource for beekeepers because it provides, in my opinion, the best and most relevant information related to the status of bees and beekeeping in the U.S., all of this being updated in "real time". Program participants regularly post informative updates on the website. I feel this is another resource that all beekeepers should utilize… frequently.



(9) Other national/international groups of note: There are other national/international organizations of note. I did not list them under "International bee clubs" because they are not bee clubs, but rather organizations with some links to honey bees and beekeeping. All are great resources for beekeepers.

A - Project Apis m (PAm) – PAm is an organization based in the U.S. They state their mission as "to fund and direct research to enhance the health and vitality of honey bee colonies while improving crop production." They are a major partner in the world of bee research and education. It is worth noting that PAm publishes an email newsletter to which beekeepers can subscribe and they maintain a website full of information for beekeepers: **http://projectapism.org/**.

B- National Honey Board – According to their website, the National Honey Board "is an industry-funded agriculture promotion group that works to educate consumers about the benefits and uses for honey and honey products through research, marketing and promotional programs." As for PAm, the National Honey Board has a wealth of information, especially honey-related, posted on their website (**http://www.honey.com/**), and the information is of great use to beekeepers.

C – USDA-APHIS – APHIS is an acronym for Animal and Plant Health Inspection Service and it is the branch of the USDA that monitors disease and pest introduction into and spread within the U.S. They sponsor the U.S. national survey for honey bee pests and diseases. USDA-APHIS often sponsors the work that results in the information beekeepers use when monitoring colony losses, the spread of noxious bee pests, and the introduction of unwanted species and races of honey bees.

D – North American Pollinator Protection Campaign (NAPPC) – NAPPC is an organization that promotes the health and wellbeing of pollinators in general, but they do quite a bit of work with honey bees specifically. They host a yearly meeting in the Washington D.C. area and they sponsor research related to honey bee health. On top of that, and most relevant to beekeepers as a reference source, NAPPC produces a lot of information about pollinators and honey bees, most of which can be found on their website: **http://pollinator.org/nappc/index.html**.

E – Prevention of Honeybee COLony LOSSes (COLOSS) – COLOSS is an international network of bee scientists, extension workers, etc. that was created to improve honey bee health globally. COLOSS members post relevant and useful information for beekeepers on their website: **http://www.coloss.org/**. The members of COLOSS strive to produce research-based answers to vexing honey bee problems.

F – International Bee Research Association (IBRA) – This is an international organization, based in the UK, and charged with the task of advancing bee science. This organization also acts as a publisher and distributor of bee books, journals, and other informational sources. You can find out more about the IBRA at **http://www.ibra.org.uk/**.

Material and Virtual Resources:

(1) Books: I once heard that beekeeping was the second-most written about subject on the planet, second only to religion. I am not sure if that is a true statement (likely not I guess), but it does serve to illustrate

an important point – there is considerable written information available on honey bees and beekeeping. The budding beekeeper should have at least a small library of books on honey bees and beekeeping. There are a few types of beekeeping books available.

The first of those includes the reference books. These are books that cover all types of information related to bees, though they do not make an effort to teach you how to keep bees. These include some great books like *The Hive and the Honey Bee* and *ABC – XYZ of Bee Culture* (both are considered the bee "bibles" – I believe both should be in every beekeeper's library). These also include subject-specific reference books, such as those designed to teach you the anatomy/physiology of honey bees, the behavior of honey bees, etc.

The second type of bee book includes a massive list of books designed to teach you how to keep bees. These are written to be a bit more practical than the aforementioned reference books. They include discussions on how to install a package of bees, make a honey crop and control bee pests/diseases. I feel that it is a good idea to own 2-3 of these type of books, just to give you an overview of how to keep bees from different people's perspective. Here, I introduce a bit of caution. Beekeeping is full of facts, but the enterprise is also rife with opinion. So, each book often gives the opinion of the author regarding a specific management topic. Since there is more than one way to "skin a cat," it is OK to consider others' viewpoints. The good news is that bees are terribly forgiving. You can elect to follow/not follow a lot of recommendations and the bees likely will be none-the-worse for it.

The third type of bee book, and the one I most enjoy discovering and in which I most enjoy getting lost, is the type introducing part of the world of beekeeping through "science writing". These are books on academic topics related to bees, but written in a manner accessible to the general public. A lot of Tom Seeley's writings exemplify this type of work, for example: *Honey Bee Democracy*. Other fairly recent titles of note include *The Spirit of the Hive* (Rob Page) and *The Buzz about Bees* (Jurgen Tautz). These, and other books like them, may be more appealing to the beekeeper with some experience under his/her belt, but they introduce the reader to the fascinating world of the insect we enjoy.

(2) Periodicals: Many countries have their own magazines/newspapers that deal with beekeeping topics in that country. We have two, widely circulated magazines focused on beekeeping in the U.S. and I would recommend subscribing to one or both. They include the *American Bee Journal* (check ☺) and *Bee Culture*. Both feature columnists and guest authors with all types of beekeeping backgrounds and perspectives. These, and other periodicals like them, are worth reading closely as they often highlight the latest trends in the craft. Subscriptions to both are very reasonable. Quite frankly, these types of publications are able to include cutting edge information, more so even than books that are updated only as often as new editions become available. Consequently, the latest information on bee craft and in bee science is accessible directly in one's living room through monthly periodicals. If you are a bee fanatic, you can even branch out and subscribe to other countries' periodical equivalents. Reading about how beekeepers from other countries approach their craft is fascinating.

(3) Newsletters: Newsletters are publications created by groups of people or various organizations. Many local, regional, state, national, and international bee clubs produce newsletters. You often do not even have to be a member of the beekeeping association to subscribe to the newsletter. You usually can just visit the association's website to see archived newsletters or subscribe to the newsletter mailing list. To use my state as an example, many local bee clubs and the Florida State Beekeepers Association have newsletters. My team and I even produce a beekeeping newsletter in collaboration with the Apiary Inspection Section of the Florida Department of Agriculture and Consumer Services. This newsletter, the *Melitto Files*, is made available at my lab's website: **http://entomology.ifas.ufl.edu/honeybee/**. Regardless, I have discovered that countless newsletters exist. Pick a few that publish information relevant to you and add them to your list of referenced resources.

(4) Websites: There are probably thousands, if not hundreds of thousands, of websites developed to disseminate information about honey bees. Many (maybe most) bee clubs have websites, as do the bee journals, research institutions, etc. Many people fear that the internet is prone to error and cluttered with rampant misinformation. There is, no doubt, some truth to that statement so I would caution against putting faith in all websites equally. That said, most websites linked to universities, extension offices, federal laboratories, and state- and nationally recognized beekeeping organizations include content that has been reviewed or otherwise vetted.

(5) eXtension (pronounced: ē–X–ten–sion) – This is a website that houses information on bees produced by bee scientists and extension specialists across the U.S. (mainly) and globe (somewhat). The web address is: **http://www.extension.org/bee_health**. To borrow from the eXtension site (**http://www.extension.org/main/about#.U30DxGpOVwE**):

"eXtension is an interactive learning environment delivering the best, most researched knowledge from the best land-grant university minds across America. eXtension connects knowledge consumers with knowledge providers - experts who know their subject matter inside out.

eXtension offers:
- Credible expertise
- Reliable answers based upon sound research
- Connections to the best minds in American universities
- Creative solutions to today's complex challenges
- Customized answers to your specific needs
- Trustworthy, field-tested data
- Dynamic, relevant and timely answers"

Put shortly, eXtension's bee health website was designed to be the "one-stop shopping" site for unbiased, research-based information on honey bees and their management. It also should be able to identify your rough location (scary, I know). Consequently, it usually includes information to the right of the page that links to your nearest land-grant institution. You need to bookmark this page on your browser.

(6) Blogs and other tools used in social media: I preface this section with a warning: I do not know all of the jargon associated with social media, though I know and understand how to use social media. So, forgive me if I use terms incorrectly. With that out of the way, it is important to point out that there are a number of technology-based tools that one can use to carry on virtual and perpetual conversations about bees. These tools include, but certainly are not limited to,

- blogs (where someone manages a webpage where he/she records his/her thoughts about a topic and to which others "subscribe" or "view" on a regular basis),
- chat boards/rooms (a virtual/online area where a "community" of individuals can meet and post thoughts/questions/com-

ments/etc. about bees, or other topics),

- instant, viewable "posts" about bees (like those posted using Twitter, which is similar to a blog, but with text use restrictions),

- integrated, social media tools (such as Facebook, a tool that is like a blog, chat room, and Twitter all rolled into one package), and

- online beekeeping/beekeeper communities (the most notable of which is Bee Source: **http://www.beesource.com/**, which is basically a "meeting site" for beekeepers interested in virtually discussing honey bees and beekeeping).

These tools are used increasingly and successfully by beekeepers around the world. They certainly are a great source of information, though remember to consider all information critically.

(7) Videos: There has been an explosion of videos related to bee and beekeeping in recent years. Traditionally, many of the training videos were documentary in nature or originated from land grant institutions. Today, everyone has video cameras and many people use them to create short videos on beekeeping. Many of these videos can be found by searching "honey bee" on video host sites such as **www.youtube.com**. There are, of course, two words of caution worth remembering when searching for videos using various search engines. (1) The information provided in the videos may/may not be reliable, depending on the source. I always recommend using videos provided by reputable sources, especially those on the BIP, eXtension, and land grant university websites. (2) Be careful how you search for videos. All types of videos are uploaded into cyberspace so you need to choose your search words carefully.

(8) Online training courses: There are bee classes that one can take online. These are becoming increasingly popular. For example, the *Beekeeper Education & Engagement System* is offered by NC State (**http://entomology.ces.ncsu.edu/apiculture/bees/**) while *Beekeeping 101* offered by Penn State (**http://beekeeping101.psu.edu/**). Users/subscribers can pay a fee and gain access to these courses. Such courses are similar to many of the beekeeping-related courses taught at universities.

(9) Master Beekeeper Programs: These programs typically are run out of land grant institutions. Master beekeeper program administrators often offer training on various bee and beekeeping related topics. Participants usually take examinations to advance the programs. Most such programs have levels through which one progresses, with each level being harder than the prior one. The advantage of these programs is that the participants often get targeted instruction on all types of issues related to beekeeping. Furthermore, master beekeeper programs often have built-in requirements for participants to go out into the community and train others about bees. These programs usually culminate at the "Master Craftsman" or similar level, by which time the participant has been involved with the program 5+ years. Involvement in these types of programs is a great way to expand one's knowledge on bees.

As I hope you can see, there are a lot of resources available to beekeepers, regardless of their amount of experience. I think the volume of resources available testifies to the importance of bees to man, both as a partner in food production and as a companion in life. I hope that you find this summary of beekeeping resources to be a good resource. ☺ Happy beekeeping.