

NCSBA MBP Certified Level Insights, Resources and Review

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Insights

Congratulations on your initiative to explore options that will enhance your knowledge of the Honey Bee. The goal of this document is to provide insights into your exploration and acquisition of knowledge, assisting you to become a successful beekeeper. Simply said, we want you to be able to keep your bees alive so you can achieve your goals. Making honey, making bees, providing pollination, utilizing products of the hive, all are valid goals. **Note:** Beekeeping is a life-long learning process. This document is 13 pages, the Certified Curriculum is 37 pages, “Beekeeping for Dummies, 5th Edition” is 466 pages. You can not learn this overnight, if you could, it would take the fun and adventure out of it. Take your time, enjoy the process, your reward will be successful stewardship of your honey bee colonies. There are lots of beekeepers at every level who are happy and honored to have you inquire about their experiences and are also grateful to hear yours.

The following information was assembled to assist you in achieving your goals as a beekeeper and to provide direction as you study to pass the Certified written test. The resources listed are an excellent accumulation of information and the review outlines what you need to know about honey bees, beekeeper history, equipment, anatomy, honey bee life cycle, nutrition, pests, diseases, management, and products of the hive.

As you read and learn about beekeeping, keep a couple of things in mind. First, beekeeping is animal husbandry. You have a responsibility to the animals you are stewarding. In times of need, their circumstances require your knowledgeable and prompt attention.

Second, you will make a significant financial investment in your bees and equipment, not to mention your time. A relatively modest amount of that investment needs to be spent on your continued education either through self-learning, using the many references available (many are listed here), and by attending meetings and conferences (either person to person or zoom). Finally, to be successful, seek out mentors, either at local NCSBA chapters meetings, at conferences you attend or from area or regional successful beekeepers. Every beekeeper, if successful, owes a portion of that success to the knowledge and experience shared from other beekeepers.

The review follows the content of several excellent references and the Certified Class Curriculum (CCC), prepared to assist NCSBA Chapters organize their Beginning Beekeeping Classes, available on the NCSBA website. You should also explore the contents of the NCSBA website and the NCSBA Yellow Book. Any book not referenced here is not an indication that it lacks as a viable source of information or knowledge. Your committee has identified references that are readily available, affordable, and presented in a way that you as the beekeeper can learn the knowledge they contain. All these resources are beneficial to you as the beekeeper/colony manager. The MBP Level designated is an indication of the depth of knowledge you would want to have as you grow your beekeeping experience.

Resources

Certified Level Books and web information:

(FLB) First Lessons in Beekeeping, 2007 edition, Keith S. Delaplane. Excellent basic information but somewhat dated. Glossary. Paper back. 166 pages.

(TBB) The Backyard Beekeeper, 4th edition, 2018, Kim Flottum. Current, concise, good photos and friendly format. Glossary. Paper back. 240 pages.

(BFD) Beekeeping for Dummies, 5th edition, 2020, Howland Blackiston. Current, concise, limited color photos, easy to follow. Glossary. Resources list. Paper back. 466 pages.

(CCC) Certified Class Curriculum, nabeekeepers.org/programs/mbp/curricula, about half way down the page click on the green link to Certified Class Curriculum.

Journeyman Level Books:

(AHB) The Anatomy of the Honey Bee, 1910, Robert E. Snodgrass. Vintage reprint of this authoritative work, black and white detailed sketches. Paper back. 226 pages, depending on reprint.

(TBH) The Beekeeper's Handbook, 4th edition, 2011, Diana Sammataro & Alphonse Avitabile. A detailed, beneficial guide to honey bee colony management, black and white sketches. Paper back. 308 pages

(HBB) Honey Bee Biology and Beekeeping, 2013 edition, Dewey M. Caron & Lawrence John Connor. University, entry level text, comprehensive, an abundance of colored photos, well organized. Glossary. Hard cover. 368 pages.

Master Level Books:

(ABC) ABC & XYZ of Bee Culture, 42nd edition, 2020, Published by A.I Root Company. Compilation in dictionary format of all things honey bee, valuable quick reference, color photos. Glossary. Hard cover. 832 pages.

(BHB) The Biology of the Honey Bee, 1987. In-dept introduction to the biology and social behavior of the honey bee, black and white sketches, summarizes previous literature, clearly written. Paper back. 281 pages.

(THH) The Hive and the Honey Bee, 2015 edition, Published by Dadant & Sons. 44 contributing authors compiling extensive knowledge of the honey bee and beekeeping in 29 chapters, color photos. Detailed General Index. Hard cover. 1057 pages.

Additional Noteworthy Books:

(WNC) Wild Flowers of North Carolina, 2nd edition, 2005, Justice, Bell & Lindsey. Invaluable visual reference and description of the wild flowers including those from bushes and trees in NC, 500 varieties listed, 2 per page, introduction includes short summary of flower form and function, color photos. Paper back. 325 pages.

(BAB) The Buzz About Bees, 2009, Jurgen Tautz. Enlightened insights into the workings of a Superorganism, excellent color photos. Hard cover. 284 pages.

(HIO) The Honey Bee Inside Out, 2nd edition, 2011, Celia Davis. Readable and easily understandable presentation of the structural and functional biology and behavior of the honey bee by a holder of the National Diploma in Beekeeping, UK, color photos. Paper back. 186 pages.

(HBD) Honeybee Democracy, 2010, Thomas D Seeley. An enlightening perspective on the decision collective and democracy of a honeybee colony, invaluable insights, color photos. Hard cover. 273 pages.

Why include advanced reference here? Good question. As you succeed in beekeeping, a plethora of ideas and opinions will be shared with you from other beekeepers. How do you decide which are valuable to you and those that may be tainted with some bias? These resources, if you

will take the time to explore them, will keep you on a logical and successful path.

Why spend money on these references? As a beginning beekeeper, purchasing everything you will need to get started for one hive, the first year, including a bee suit or jacket, veil, hive tool, smoker, gloves, wooden ware, bee's supplemental food and medication, will cost about \$500.00. As it helps to start with two hives, that increased your first-year expense by about \$300.00. If you buy all three certified level books your cost is less than \$50.00. Not a bad investment to help you be successful.

The following review includes the Certified Level references listed above using their abbreviation in parenthesis. Only text chapters numbers or, for the (CCC), section numbers, are listed, encouraging you to explore beyond the specific questions or subject.

We hope you find beekeeping as rewarding as we do and look forward to hearing about your success.

Review

This review includes the Certified Level references listed above using their abbreviation in parenthesis. Only text chapters numbers or, for the (CCC), section numbers, are listed. Hopefully, this encourages you to explore beyond the specific questions or subject.

NCSBA (North Carolina State Beekeepers Association):

- How long it has been in existence?
- Which is the largest state beekeeper's association in the USA?
- The NCSBA is a resource for information and comradery that will benefit both your beekeeping experience and expertise.
- It offers many programs that encourage your involvement, enjoyment, and continued education.

- What are the various programs and opportunities supported by NCSBA? They include the NC Zoo, NC State Fair, NCSBA Master Beekeeper Program, Golden Achievement Program, Certified Honey Producer Program, annual judged contests for hive products and more.

Ref: NCSBA Yellow Book, The Official Handbook & Directory of the NCSBA. The NCSBA website, NCBeekkeepers.org.

HISTORY of BEEKEEPING and HIVE PRODUCTS:

- How long has man been harvesting honey (and other products) from honeybees? What are some of the various ways that they kept bees?
- What list of products is obtained from a bee hive?
What are those products used for?
- What are some of the ways that man used bees and bee products in the past? What is the primary importance of the honey bee?
- What is Bee Space?
- Who is Rev. L.L Langstroth and what is he most known for?
- Who are Charles Dadant and A. I. Root?
- What inventions have modernized beekeeping?
- When did honey bees arrive in the Americas?
- What major events occurred in the US that regulated or changed methods of beekeeping?
- What major events occurred in N.C. that regulated or changed methods of beekeeping?

Ref: (TBB) Introduction, (FLB) Ch 1, (BFD) Ch 1, 15, 18, (CCC) Section 2, 3.

RACES Of BEES

- What are the various types of bees throughout the world?
- What are the races of bees that are kept and what are their characteristics?
- What makes an Africanized Bee different from the European (or “western”) honey bee? What threats or difficulties do Africanized bees pose to the USA and NC?
- What can be done about Africanized honey bees? (NC response)

Ref: (TBB) Ch 1, (FLB) Ch 1, (BFD) Ch 6, (CCC) Section 4, NCBeekkeepers.org/Resources.

FORAGING and POLLINATION

- What is pollination? Be generally familiar with parts of a flower.
- How do bees differ from other insects in relation to pollination capabilities? What are the benefits of apiculture to agriculture?
- What crops are dependent on honey bees for pollination?
- What crops benefit from bee pollination, but do not require bees to set fruit? What crops do not require bees at all to pollinate?

- What are the differences between a hobbyist beekeeper; a sideliner; and a commercial operation? What do the commercial operations do throughout the year?

Ref: (TBB) Ch 2, (FLB) Ch 2, 5 (BFD) Ch 1, 4, 18, (CCC) Section 6, 17.

ANATOMY:

- What are the two sexes of honey bees in a colony? What are the two castes of honey bees in a colony?
- What is haploid? What is diploid?
- What are the 4 stages of honey bee development? How are they different from one another?
- What is the purpose of each stage? What is the length of time for each stage by caste or sex?
- What are the different segments of the bee?
- What primary structures (organs and glands) are located in each segment? What are their functions?
- What are the different sensory structures of an adult bee (how do bees see/hear/smell/taste/feel?)
- Know the primary functionality of the body parts and organs, and general location of the circulatory, respiratory, digestive and excretory systems (alimentary system).

Ref: (TBB) Ch 2, (FLB) Ch 2, (BFD) Ch 2, (CCC) Section 5, 6.

QUEEN:

- What is the sex of the queen? Is a queen haploid or diploid?
- How does she differ in appearance from a drone or a worker bee?
- How is a queen produced? When does a colony produce a new queen, and why?
- What is a swarm cell? What is a Supersedure cell? Where, when, and why are they in the hive? How, where and when do bees mate?
- What is the approximate life length of a queen?
- Approximately how many eggs does a queen lay a day (during brood build-up)?

Ref: (TBB) Ch 2, (FLB) Ch 2, (BFD) Ch 2, (CCC) Section 5, 6.

WORKERS:

- What is the sex of the “worker bees” in a colony? Are workers haploid or diploid? How is the worker different from a queen?
- Do workers have ovaries? Can they lay eggs?
- What are the various tasks of the worker bee; and at what age do they generally perform these tasks? How long does a worker bee live? (in the summer? / in the winter?)

- What do bees forage for outside the hive?
 - How do they transport what they forage on?
 - Where are foraged items stored in the hive?
 - What changes, if any, do the bees make to the items they forage for?
- Ref: (TBB) Ch 2, (FLB) Ch 2, (BFD) Ch 2, (CCC) Section 5, 6.

DRONES:

- What is the sex of a drone bee? Are they haploid or diploid?
 - What is the primary function of drone bees?
 - How do they differ in appearance and function from the queen and the workers?
 - What is a drone's development time?
 - How long does a drone live?
 - What happens to drones in the winter?
 - Do drones feed themselves? Do drones make wax, bee bread, or honey?
- Ref: (TBB) Ch 2, (FLB) Ch 2, (BFD) Ch 2, (CCC) Section 5, 6.

BROOD:

- What is meant by "brood"?
 - Where is brood generally found in the hive?
 - What does healthy larvae look like?
 - What are the three stages of development prior to emerging as an adult bee?
 - How does a brood cell become capped?
 - How does the covering of brood cells differ from the covering on honey or pollen? Why? Composition?
 - What does brood eat? How?
- Ref: (TBB) Ch 2, Glossary, (FLB) Ch 2, Glossary, (BFD) Ch 2, Glossary, (CCC) Section 6.

GLANDS and PHEROMONES:

- Queen Substance pheromone, Nasanov gland, Wax glands, Alarm pheromones(sting).
- Ref: (TBB) Ch 2, Glossary, (FLB) Ch 2, Glossary, (BFD) Ch 2, Glossary, (CCC) Section 6.

COMMUNICATION:

- Dancing /Pheromones

Ref: (TBB) Ch 1, 2, (FLB) Ch 2, (BFD) Ch 2, (CCC) Section 6.

BEE ACTIVITY/colony as an organism

- What is a “superorganism”?
- How far do bees fly when foraging? Mating?
- How much forage area is necessary to support a colony of bees?
- Bee Nutrition: what does pollen provide? What does nectar provide?
- Does it take more effort of the workers to make honey or wax?
- What are the following bee activities? How do they impact hive management? What can a beekeeper do to minimize negative impacts?
 - What is swarming?
 - What is Supersedure?
 - What is absconding?
 - What is a laying-worker?
 - What is a drone-laying queen?
 - What is robbing?
 - What is drifting?
- Temperature/Weather
 - At what temperature do honey bees decline to leave the hive? Fly?
 - What are the effects of sunny vs. cloudy days? Wind or no wind? Humidity?
 - Rain? What are safe weather conditions to do a hive inspection?

Ref: (TBB) Ch 2, 3, (FLB) Ch 2, (BFD) Ch 9, 10, 12, 19, (CCC) Section 6.

Honey Bee Management:

- Where do honey bees live in nature?
- What materials do they use to construct their hives?
- Why is honey comb built the way it is? Bee space / shape / location / composition.
- Does one strong colony make more or less honey than two colonies each half the size? Why?
- You should have a general knowledge of making “splits”, combining colonies, discouraging swarming, robbing, drifting, and absconding.

Ref: (TBB) Ch 2, (FLB) Ch 2, (BFD) Ch 10, 18, (CCC) Section 6.

HIVE EQUIPMENT:

- What components are there in a modern hive?
- What is the purpose of each piece being considered for use?
- What standard protective clothing and tools might a beekeeper use?

Ref: (TBB) Ch 1, (FLB) Ch 3, (BFD) Ch 5, (CCC) Section 13.

SITE SELECTION: (including Good Neighbor practices, rules & regulations).

- What are some considerations when deciding where to place a bee yard?
- Which direction should the hive opening(s) face? Why?
- What are some unfavorable conditions to consider when placing a bee yard?
- How might a beekeeper overcome unfavorable conditions?
- What laws exist regarding keeping bees where you intend to place your apiary?

Ref: (TBB) Ch 1, (FLB) Ch 4, (BFD) Ch 3, 19, (CCC) Section 10.

OBTAINING BEES:

- Where might you obtain bees?
- Know NCDA&CS apiary inspection service agency – department of Plant Industry.
- Know “buying and selling bees”, see the NCSBA or NCDA&CS website.
- Know the procedures to install a package of bees, with a new queen.
- Know how to introduce a new queen to an established colony.

Ref: (TBB) Ch 3, (FLB) Ch 4, (BFD) Ch 6.

HIVE MANIPULATION:

- Know how to light a smoker, and keep it lit for the duration of a normal hive inspection.
- What is the proper technique for opening a hive?
- What are some beekeeper procedures that minimize colony damage, defensiveness, and encourage colony well-being?
- What beekeeper behaviors should be avoided?

- How should frames be manipulated?
- Where should they be placed if removed from the hive?
- How should a hive be put back together?
- What can be done to minimize burr comb?

Ref: (TBB) Ch 3, (FLB) Ch 4, (BFD) Ch 7, 8, (CCC) Section 14, 18, 19.

STINGING:

- Why do bees sting? What happens to the honey bee once it has stung?
- What should one do if stung in the bee yard? -- If a bee gets inside a veil?
- Know how to remove a stinger.
- What reactions to a bee sting are normal?
- What reactions to a bee sting are life threatening?
- What should be done in response to a normal reaction? ... a serious life-threatening reaction?

Ref: (TBB) Ch 1, (FLB) Glossary, (BFD) Ch 3, (CCC) Section 10, 11.

SEASONAL MANAGEMENT:

- What colony activities can be expected of the bees at the various times of year in your area?

Ref: (TBB) Ch 3, (FLB) Ch 5,7, (BFD) Ch 9, (CCC) Section 14.

SPRING:

- Inspection / Feeding / Equipment Manipulation, and why?
- Safe Weather Conditions for hive manipulation.
- Describe honey flow / 70 % "rule" / ratio of sugar to water in feeding/ pollen patties

Ref: (TBB) Ch 3, (FLB) Ch 5, (BFD) Ch 9, (CCC) Section 14, 15.

SUMMER:

- Honey Harvesting, storage, and distribution
 - How does one go about harvesting honey?
 - How much honey, and when should it be extracted from the colony?
 - Moisture content of honey. What happens if it is higher or lower than the recommended or legal requirements?
 - What types of honey are there? How does the choice of type of honey effect the decision on what type of equipment to use on a hive?

- What cleanliness and food safety procedures should be incorporated in the extraction and bottling of honey?
 - Are there rules and regulations that govern this activity?
 - What equipment might be used for extracting and bottling honey?
 - How does a mechanical extractor work?
 - What is a honey gate?
- Concerning Labels:
- Are there laws and regulations governing what is required on a label? What are recommendations for labels?
 - Why do some honey labels state that it is unsafe to feed honey to infants?
- What should be done with any equipment or frames from which honey was extracted?
Ref: (TBB) Ch 3, 4, (FLB) Ch 5, 6, (BFD) Ch 9, 16, 17, 18, (CCC) Section 14, 16 ABC.

FALL:

- What is winter-prep? When should winter-prep activity be initiated? Treating bees for pests in the fall – how and why?
 - Fall re-queening vs spring re-queening Fall brood build-up
 - Equipment considerations
 - Feeding bees (ratio of sugar to water)
- Ref: (TBB) Ch 3, (FLB) Ch 5, (BFD) Ch 9, (CCC) Section 14, 15.

WINTER:

- Clustering characteristics.
 - Ventilation requirements.
 - Protection from inclement weather.
 - Inspecting hives during winter.
- Ref: (TBB) Ch 3, (FLB) Ch 5,7, (BFD) Ch 9, (CCC) Section 14.

IPM: Integrated Pest Management

- Define it.
 - How and why is it useful to beekeepers?
 - Pesticide legalities, labels and usage?
- Ref: (TBB) Ch 3, 5, (FLB) Ch 8, (BFD) Ch 12,13, (CCC) Section 7.

PESTS of the HONEY BEE

- (Varroa Mites, Tracheal Mites, Greater Wax Moth, Small Hive Beetle...and... Ants, Yellow Jackets, Mice, Bear, possibly others?)
- Know the various pests
- Know how to check for tolerable thresholds of pest infestation.
- Know the cause of the introduction to the colony of these pests Know the life cycle of the pests
- Know the symptoms of infestation by pests & the effect on the colony of bees.
- Know what can be done to eliminate or reduce the presence and effect of pests.

Ref: (TBB) Ch 3,5, (FLB) Ch 8, (BFD) Ch 13, (CCC) Section 9.

DISEASES of the HONEY BEE

- (AFB, EFB, Nosema, Sacbrood, Chalkbrood, Deformed Wing Virus, Paralysis Virus) Know the various diseases.
- Be aware of what causes the various diseases.
- Know the symptoms of the various diseases, when and where to look for them.
- Know the effect the diseases have on the colony.
- Know the treatment or beekeeping activity to eliminate, relieve, or prevent the diseases.

Ref: (TBB) Ch 3,5, (FLB) Ch 8, (BFD) Ch 12, 19, (CCC) Section 8.

NON-DISEASE colony disorders

- Chilled Brood / Starvation / Pesticide Exposure
- Know how to recognize them, and what can be done to prevent, relieve, or remedy them.
- CCD – know the symptoms, what to do – who to contact, what’s the difference from other bee activity (such as absconding).

Ref: (TBB) Preface, Ch 3,5, (FLB) Ch 3,8, (BFD) Ch 10,11,12, (CCC) Section 14.