THE EAS MASTER BEEKEEPER CERTIFICATION PROGRAM

PART 1 OF 3: THE PROGRAM

BY NATALIE ANN COMEAU

DO YOU FANCY YOURSELF A FAIRLY KNOWLEDGEABLE beekeeper? Enjoy a challenge? Like to test your knowledge? Well, the Eastern Apicultural Society's got the program for you at the upcoming EAS 2015 Conference in Guelph, August 10-14.

Founded in 1955 to promote bee culture, educate beekeepers, and support excellence in bee research, the EAS is an international non-profit organization – the largest non-commercial beekeeping organization in the United States, and one of the largest in the world.

Master beekeeping programs are offered through several universities and beekeepers' associations throughout the United States – although there is no standard curriculum or official governing body. The most recognized and longest-running in North America is offered by the Eastern Apicultural Society, which provides resources and guidance to beekeepers who wish to become certified, and conducts certification exams at its annual conference.

According to the EAS website: "The purpose of the Master Beekeeper certification program is to identify and certify people who have a detailed knowledge of honey bee biology, expertise in the proper practices of beekeeping, and can present this information to the beekeeping and non-beekeeping public in a detailed,

accurate, clear and authoritative manner. The goal of this program is to certify that those who are awarded the *Master Beekeeper Certificate* are competent at a college level in the four areas where they are tested."

The program was created in 1978 at Cornell University, the brainchild of bee biologist and world-renowned apiculturist Roger A. Morse, Ph.D. (1927-2000). A professor of entomology, Morse was a regular columnist for *Bee Culture* magazine, and authored many articles and books, including *The New Complete Book of Beekeeping*.

Morse modelled his program on similar organizations in the United Kingdom which made higher education in the science of beekeeping available to the general public. The curriculum focused on current research and best practices, and the goal was that master beekeepers, once certified, would mentor novices and serve as a resource in their communities. The program was tremendously popular, and in 1981 Morse handed the reins over to the EAS, making Master Beekeeper certification accessible to a much wider audience.

Today, growing interest in beekeeping in North America – especially among small, hobby beekeepers – has created a need for experienced, knowledgable beekeepers to provide mentorship, coaching and support. Certified Master Beekeepers also serve as a source of expert information in their communities, providing information to media and guidance to local governments. There are approximately 150 EAS certified master beekeepers, only six of which are in Canada – four in Ontario and two in Quebec.

To apply, candidates must have at least five years' experience as a dedicated hobbyist, a commercial beekeeper, or an apiary inspector. A letter of recommendation is required from a Master Beekeeper, professional beekeeping specialist, or the president of a local or provincial beekeeping organization who knows you well. The cost is $100US, and the deadline to apply is July 1st. "Anywhere from a dozen to double that number take the exam each year," says Dewey Caron, the current EAS Master Beekeeper advisor. "The pass rate is anywhere from 50% in the case of the lab exam to nearly 100% for the field exam." Very few candidates pass all four exams on their first try.

On the first night of the conference, candidates meet as a group with the Master Beekeeper advisor and a handful of Master Beekeepers to learn more about the program and ask any last-minute questions. The written exam is held the following morning, with individual oral exams taking place in the afternoon. The lab exam takes place the next day, followed by the hands-on field exam in the beeyard. On the last day of the conference, candidates meet individually with the Master Beekeeper advisor to get their results and review their exams. The passing grade is 85% – certificates are awarded to successful candidates at the banquet.

"THE PURPOSE OF THE MASTER BEEKEEPER CERTIFICATION PROGRAM IS TO IDENTIFY AND CERTIFY PEOPLE WHO HAVE A DETAILED KNOWLEDGE OF HONEY BEE BIOLOGY, EXPERTISE IN THE PROPER PRACTICES OF BEEKEEPING, AND CAN PRESENT THIS INFORMATION TO THE BEEKEEPING AND NON-BEEKEEPING PUBLIC IN A DETAILED, ACCURATE, CLEAR AND AUTHORITATIVE MANNER."

ROGER A. MORSE, PH.D.
CREATOR OF THE EAS
MASTER BEEKEEPER
PROGRAM

EAS ONTARIO 2015

In our upcoming issues, we'll delve into more detail about the four exams, what to expect, and how to prepare for them. And we'll provide plenty of sample questions, like these, to test your knowledge:

1. What are the primary functions of bees located in the centre and on the outer surface of the winter cluster for an outdoor wintered colony in Ontario?
2. True or false: Nurse bees secrete protein-rich material from abdominal glands to feed their brood.
3. The queen's mandibular gland produces a pheromone that both helps unify a colony and is a means for worker bees to identify her. What pheromone does the worker's mandibular gland produce?
   A. The same pheromone as the queen, but in smaller amounts
   B. Nothing, it is vestigial
   C. Worker-identifying pheromone
   D. Alarm pheromone, secondary to the sting alarm chemical
   E. Swarming and clustering pheromone
4. *Miel virgen* is honey from which social bee in the Americas?
5. Approximately how much honey is used to produce a bottle of mead? (Assume your yield = 4 finished bottles/gallon of mead started)
6. What does the label "Lehua" on a Hawaiian honey jar likely refer to?
7. Of the 12 major human foods (coffee is not one of them), how many require insect pollination?
8. Name the major crops in the Maritimes and Western Canada that require honey bee pollination?
9. Approximately how many bee colonies are needed annually to pollinate almonds in California?
10. A Langstroth bee hive is constructed/organized similar to a natural nest in a bee tree. Describe four points in common between a bee hive and a natural nest in a tree.

ANSWERS:

1. Bees on the winter cluster surface serve as insulators to conserve heat. Bees in the centre of the winter cluster generate heat and care for brood, if it is present.
2. False
3. D
4. Stingless bee
5. 3-4 lb.
6. Floral source
7. One
8. Blueberries and canola
9. More than 1.5 million
10. Small, defensible entrance; parallel, vertical beeswax combs; organized brood area with food storage to the sides and above; propolis smoothing the roughness around the outside of the nest.

A FULL LIST OF RESOURCES CAN BE FOUND ON THE EAS WEBSITE AT *EASTERNAPICULTURE.ORG* – IT INCLUDES BOOKS, JOURNALS, NEWSLETTERS AND WEBSITES ON TOPICS RANGING FROM BASIC BEEKEEPING KNOWLEDGE TO ANATOMY, BIOLOGY, BEHAVIOUR, DISEASES AND PESTS, BEESWAX AND HONEY, PESTICIDES, PLANTS AND POLLINATION. THE MASTER BEEKEEPER CERTIFICATION COMMITTEE IS AVAILABLE TO ANSWER QUESTIONS BY EMAIL AT *MBCERTIFICATION@EASTERNAPICULTURE.ORG.*

COME ONE, COME ALL!

EASTERN APICULTURAL SOCIETY ANNUAL CONFERENCE

UNIVERSITY OF GUELPH
ONTARIO, CANADA

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AUGUST 10—14
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EAS ONTARIO 2015

THE EAS MASTER BEEKEEPER CERTIFICATION PROGRAM

PART 2 OF 3: THE ORAL AND WRITTEN EXAMS

BY NATALIE ANN COMEAU

IN OUR LAST ISSUE, WE FEATURED AN OVERVIEW OF THE Eastern Apicultural Society's Master Beekeeper Program, which certifies qualified beekeepers to act as ambassadors for the beekeeping community. The four-part certification exam – which tests a candidate's knowledge of honey bees and beekeeping – will be taking place at the EAS Conference this summer, August 10-14, on the campus of the University of Guelph. In this issue, we're taking a look at parts one and two – the oral and written exams.

THE ORAL EXAM

As ambassadors and mentors, it is critical that Master Beekeepers be able to "stand and deliver" under virtually any circumstances. The oral exam is meant to evaluate how well a beekeeper can communicate his or her knowledge in a way that is accurate, engaging, and appropriate for the audience concerned. Candidates sit down with three testers for the one-hour exam, which consists of three or four impromptu questions as well as a short prepared presentation.

The impromptu questions approximate those a beekeeper might encounter when dealing with the press, during a radio interview, or while mentoring another beekeeper. The candidate is allowed three minutes for their answer, and testers look for a clear introduction, a concise discussion of facts, and succinct recommendations. A sample question might go something like this:

"I took the beekeeping class this year. It is August now and I have two colonies. I just checked them and one is dead. It was killed by wax moths. I don't remember much about wax moths from class – they went over it really fast. But I'm upset and don't want this to happen again. Please tell me what I should look for to prevent this happening again."

The topic for the prepared presentation is assigned once a candidate's application to write the Master Beekeeper exam has been accepted. This component tests a candidate's ability to give a talk in front of a town planning board, a bee club, or any other organization. The presentation is five minutes in length, with a few minutes afterwards for follow up questions (simulating a real audience). Candidates are encouraged to use visual aids such as posters, handouts, and Power Point presentations to enhance their talk.

The three testers each complete an evaluation form that assesses the candidate's accuracy and completeness, delivery and presentation, ambassadorship, preparedness, and listening skills. Each question is worth 25 points, and the candidate must earn a score of 85 or higher from two of the three examiners in order to pass.

To prepare for the exam, EAS recommends attending meetings, asking questions, and understanding what makes an effective response. Volunteering to be a speaker is good experience – ask listeners for feedback, and practice until you feel comfortable. In fact, trying out your five-minute presentation in front of an audience will help you determine how well-prepared you are, and whether your information fits within the allotted time. Remember, keeping on topic is important.

THE WRITTEN EXAM

Being well-read on the subjects of bee biology and hive management is a must, and candidates are expected to be up-to-date on current issues such as industry trends and scientific research.

The EAS website provides an extensive list of recommended resources and reference material that Master Beekeepers would be expected to have in their own collections. Public libraries are also a valuable resource, as they can bring in many of the books for you through their inter-library loan program. (Hint: most questions are based on the book *Honey Bee Biology* and *Beekeeping by Dewey Caron* and *The Beekeeper's Handbook* by Sammataro and Avitabile.)

The written exam is closed-book (you cannot bring any reference materials in with you) and usually takes about one hour, although candidates are allowed up to four hours to complete it. Material covers bee biology, apiary management, and contemporary issues in apiculture. Questions are presented as multiple choice, true-or-false, and fill-in-the-blank, along with some short essay-style questions. The passing grade is 85.

TEST YOUR KNOWLEDGE WITH THESE SAMPLE QUESTIONS:

TRUE OR FALSE

1. Granulation of extracted honey means honey spoilage, so consumers often throw it out – but it can still be used to feed a bee colony.

2. Bee bread is pollen stored in beeswax cells of the brood nest. It provides the 10 required amino acids, necessary cholesterol, fats, vitamins and minerals, plus most of the carbohydrates needed by larvae and newly emerged adults for normal development.

3. Extracting surplus honey requires ownership of (or access to) an extractor plus settling/bottling tank. To sell honey, the beekeeper needs to heat and ultra-filter the liquid for improved shelf life of extracted honey bottles.

MULTIPLE CHOICE

1. The mandibular gland of the queen produces a pheromone that has several functions, including:
   A. Hive orientation pheromone
   B. Queen identifying pheromone
   C. Alarm pheromone
   D. Swarming pheromone

2. The brood disease European Foulbrood (EFB) is:
   A. Most likely detected by examining capped brood
   B. Caused by a bacteria
   C. A common symptom of CCD
   D. Readily distinguished from other diseases/chilled brood by odour

3. The spring buildup of a bee colony:
   A. Can double the colony population in two brood cycles
   B. Is independent of the amount of stored bee bread reserves
   C. Is dependent upon the queen's ability to lay 2,000 eggs per day
   D. None of these responses – spring buildup is temperature related

FILL IN THE BLANKS

1. The worker scent gland is located on the _____ body region; it is also termed the _____ gland. When releasing the scent, the bee's characteristic body position is _____.

2. Spring management initially might involve reversing of brood boxes or feeding bees a _____ sugar syrup to _____ the colony to grow.

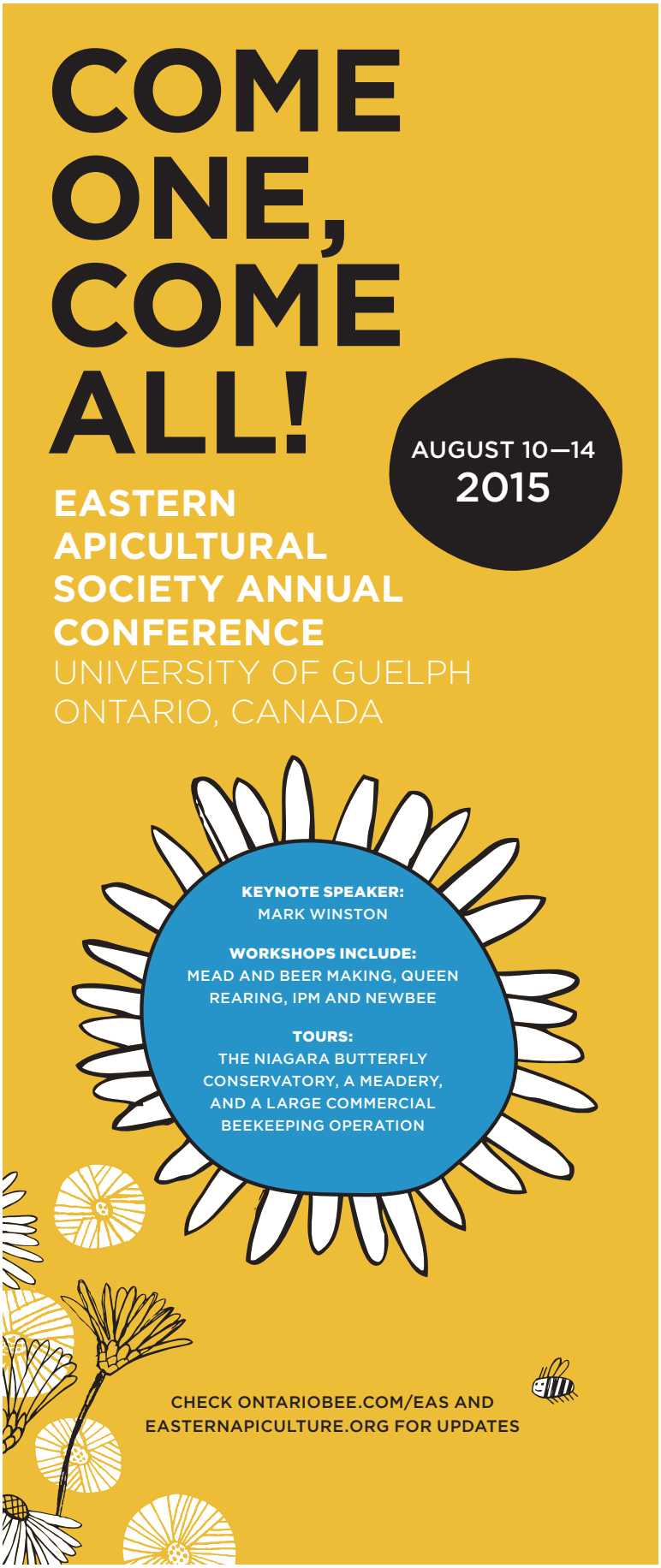
An alternative to reversing boxes is to checkerboard with drawn frames. What two things might reversal or checker-boarding help accomplish within the next month?

1._____

2._____

3. L. L. Langstroth is credited as discoverer of the first practical _____. He understood the concept that bees have _____. This hive (or book he wrote on how to use it) was not a financial success for Reverend Langstroth. What else did he do to make money in bees? _____

WANT TO KNOW THE ANSWERS?
FIND THEM AT ONTARIOBEE.COM/EAS



ESSAY QUESTIONS (10% OF THE EXAM WILL BE ESSAY QUESTIONS – GRAMMAR IS NOT GRADED)

1. You just started a bee colony last year and now you want to make your bees "pay back" your investment. Develop a reasonable plan designed to allow you to recoup your initial investment (assume $500) in three years, beginning the second spring, with a single overwinter surviving bee colony (assume you have above-average survival of colonies and nucs).

2. Spring management has three distinct phases – buildup, keeping together, and adding storage space. What two things can be done to bolster slowly developing spring colonies, and when are they done? (in bee population terms – not calendar date). (2 points)

What does "keeping colonies together" mean, and how can it be achieved? (2 points)

And finally, how should extra space be added to a fully developing colony in spring? (1 point)

Candidates are expected to have a university-level knowledge of the subject, and should expect to spend three to six months preparing for the exam. Participating in an intermediate-level beekeeping workshop is recommended, as is taking a university course in apiculture – however they aren't mandatory. Attendance at conferences and local beekeeping meetings, as well as interacting with experienced beekeepers, assists candidates in rounding out their knowledge and keeping current about the issues.

Next issue, we'll go over day two of the exam period – the lab and field exams.

For more information about the EAS Master Beekeeper program, or for access to practice exams, visit www.easternapiculture.org.

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PART 3 OF 3

BY NATALIE ANN COMEAU

LAB EXAM

The EAS master beekeeper lab exam tests a candidate's ability to recognize unhealthy bees and colonies, and to diagnose the source of the problem. The exam consists of 25-30 stations featuring two to four questions each (three to four points per station) where one or more items such as specimens and equipment are displayed. Questions include identification of the object and the context in which it is used. Candidates will be asked to identify what is at each station and at what time of year a particular object would be used, as well as its main function. For example, candidates may be asked to identify an entrance reducer and explain that it would be used late summer though winter to keep mice out of a colony (and not, as is sometimes assumed, to keep the colony warm).

THE EXAM COVERS THE FOLLOWING SIX AREAS:

- Identification of bee diseases such as American Foul Brood, European Foul Brood, sacbrood, Nosema, chalkbrood, and chilled brood; mixed syndromes such as Bee PMS and CCD; and disease vectors such as Varroa mites, as well as appropriate controls for all of the above.
- Identification of pests, predators, and parasites including wax moths, small hive beetles, mice, bears, and pollen mites, as well as recommendations for controls, where applicable.
- Identification of honey and bee products, including when and how these products are obtained by the bee; and when, how, and what beekeepers use to harvest them. Candidates should also be familiar with the criteria used in judging honey and bee products, and how beekeepers can avoid negatively affecting the quality of these products.
- Identification of beekeeping equipment, including gadgets, implements and various hive furniture; what the equipment is used for; and the approximate cost of basic hive components and accessories.
- Identification of the basic procedure for queen production, such as the age of larva used for grafting and the tools used in queen rearing.
- Identification of the main plants pollinated by bees as well as those used to yield surplus honey.

During the minimum five years of experience that is required to qualify to take the exam, it's unlikely that candidates will have had the opportunity to observe first hand all of the diseases and conditions that affect bees. Therefore, the EAS recommends shadowing a bee inspector or commercial beekeeper to gain experience, as well as judging a honey show, or shadowing a honey show judge.

Familiarity with the equipment used in beekeeping is also important, so perusing several catalogues and websites, or visiting the vendor's area at a bee conference, is helpful in getting an idea of what's available, what it's used for, and the approximate cost of major items. It's important to stay current on the newest equipment and gadgets available, such as moisture-reducing rims, top bar hives, and propolis collectors.

Finally, candidates should be able to identify and differentiate between the major races of honey bees, other bees, close wasp relatives, and similar insects (such as flower flies), understand the diseases that affect them, and be familiar with their nesting habits.

SAMPLE QUESTIONS:

1.

a) Identify what you see at A on this frame (could be a diseased cell for example, or maybe an empty drone cell). (1 point)

b) If you return next week to this same frame, what would you expect to see in this exact cell? (2 points)

c) What is happening at marker B (could be cell with liquid, cell with two pollen pellets on top of bee bread, an irregular cell)? (1 point)

2. Before you are five chemicals (marked A through E) that you might purchase to use in your bee colony (for example, A: Apivar, B: Apiguard, C: Honey-B-Healthy, D: Fumagillin, E: powdered sugar).

a) What material(s) might be used to control bee mites (Answer: A, B & E) (1 point)
b) What material(s) might have an essential oil as part of their ingredients? (Answer: B & C) (1 point)
c) What material(s) might be effectively used for bee disease control? (Answer: D) (1 point)
d) What material(s) might be effective against a brood disease? (Answer: None of the above) (1 point)

3. Before you is a jar of honey.
a) What is the approximate content of this jar? (Answer: Supersaturated sugar solution, about 16-18% water, trace of plant nectar, vitamins, hormones, acids, etc.) (1 point)
b) If this jar was ultra-filtered, what could you tell about its floral origin? (Answer: Nothing, as no pollen would be present) (1 point)
c) Based on honey colour (a very light greenish tinted liquid), and the fact that this was bottled two years ago, could you make an educated guess about the floral source? Qualify your answer by indicating what else you would want to know about the honey. (Answer: Could not identify floral source without tasting it and/or an educated guess would be basswood *(Tilia),* and would want to know what time of year and where it was produced) (1 point)

4. Before you are gadgets that you might use in queen rearing. (A: queen catcher, B: Chinese grafting needle, C: JZBZ plastic queen cups)
a) What is A and how is it used? (Answer: To catch queens to set up queenless starters or new mated queens from mating nucs) (1 point)
b) If you wish to graft queens, explain how B would be useful. (Answer: Use to transfer <24-hour-old worker larvae into queen cups) (2 points)
c) If you graft and did not have C, what could you substitute? (Answer: Pure beeswax cups made with wooden dowel as substitute for the plastic cups) (1 point)

5. Before you are five insects (A: yellow jacket, B: bumblebee, C: hornet, D: flower fly (a close colour-mimic of honey bees, but has two wings instead of four), E: small hive beetle). Note: Answers may be one or more of the above, or none of the above.
a) Which of these might be a honey bee pest for which trapping of adults is the best form of control? (Answer: A & E) (1 point)
b) Which of these might be close relatives of the honey bee (in the order Hymenoptera)? (Answer: A, B & C) (2 points)
c) Which of these might sting and be called a bee by the general public? (Answer: A, B & C) (1 point)

FIELD EXAM

The field exam tests a candidate's ease and familiarity with colony examination techniques as well as their responses to questions asked by the examiner. Candidates should be properly equipped with a veil, smoker, fuel and lighter, as well as a clean hive tool. Use of gloves is discouraged unless absolutely necessary due to allergies or other conditions. (Note: Due to biosecurity issues, only gloves and equipment supplied by the University of Guelph will be used.)

The EAS recommends hands on experience – and lots of it – to prepare. Working with an expert, such as a local apiary inspector, is a great opportunity to learn about pests and diseases, as well as to get feedback on handling techniques and inspection skills, and recommendations for improvement.

Mentoring new beekeepers is also a valuable learning experience, as it helps candidates perfect their own technique while simultaneously practicing their teaching skills – an important part of being a master beekeeper.

During the exam, the candidate will be asked to open one or more hives, and will be graded on proper approach, method of opening, and use of equipment, as well as examination techniques and closing up of the hive. They will also be asked to evaluate each

HOW TO APPLY

- The deadline to apply to write the master beekeeper exam is July 1st. Onsite registration is not available.
- Candidates should have a minimum of five years' experience as a serious beekeeper (a commercial beekeeper, apiary inspector, or serious hobbyist, for example).
- A written recommendation from a current master beekeeper, professional beekeeping specialist, or current president of a local or provincial beekeepers' association is required. Candidates must have a long-standing, personal relationship with the individual making the recommendation.
- Application and recommendation forms, as well as information on how to apply, can be found at www.easternapiculture.org
- Questions can be addressed to mbcertification@easternapiculture.org

colony and answer questions relating to hive condition, equipment, proper use of accessories, and colony care. A master beekeeper would commonly be asked these questions during hive demonstrations, so candidates should be able to provide answers while simultaneously continuing the colony examination. Begin with the simple answer, and elaborate only if prompted – a long, unorganized response while the colony is open and being inspected is not in the best interest of the beekeeper, the observers, or the bees. (Note: If you are unorthodox in your opening and inspection techniques, explain these variations to the examiners who are grading you. Use of a veil and smoker are mandatory.)

QUESTIONS MAY CONSIST OF THE FOLLOWING:

- Evaluation of the colony, including amount and condition of brood, food stores, caste members, and evidence of current and past conditions.
- Explanation of normal colony inspection, hive management and care, and when things like making splits or checking for queen cells should be done, and how.

SAMPLE QUESTIONS

1. What is the smoker doing to ease your colony entrance and why did you use it as you just did?
2. What are you looking at there?
3. Show me an irregular cell, drone cells, pollen, capped honey, etc.
4. What foundation was used to draw these cells?
5. What is your assessment of the brood pattern you are seeing? Is it evidence of a queenright colony?
6. Show me how you would look for eggs.
7. Do you see evidence of disease? What are you looking for to show such evidence? How would you look for evidence of EFB? Wax moth? Queenless condition?
8. Assume this is your colony and it is now mid-August. What would you do before you close it (this would come after the basic examination)? Would you feed it? How and with what would you feed it?
9. Overall assessment of your colony inspection – what did you learn? What were you able to convey to a mentee or audience while doing this inspection?
10. You will also need to pick one or two other pieces of equipment (from a selection) and explain what they are and why and how you would use them. (Note: Keep explanations to the basics)