

**Registration form**

**African Honey Bee CEU Training Course \$100.00**  
**48 HOUR RUSH ORDER PROCESSING FEE ADDITIONAL \$50.00**  
*Rush service does not include overnight delivery or Fedex fees.*

**Start and finish dates:** \_\_\_\_\_

*You will have 90 days from this date in order to complete this course*

**Print Name** \_\_\_\_\_

I have read and understood the disclaimer notice found on pages 2 and 6. Signature is required.

**Signature** \_\_\_\_\_

**Address:** \_\_\_\_\_

**City** \_\_\_\_\_ **State** \_\_\_\_\_ **Zip** \_\_\_\_\_

**Phone:**  
**Home** (\_\_\_\_\_) \_\_\_\_\_ **Work** (\_\_\_\_\_) \_\_\_\_\_

**Fax** (\_\_\_\_\_) \_\_\_\_\_ **Email** \_\_\_\_\_

**License or Operator ID #** \_\_\_\_\_ **Exp. Date** \_\_\_\_\_

**Class/Grade** \_\_\_\_\_

Please circle/check which certification you are applying the course CEU's.

Commercial Applicator \_\_\_\_\_ Residential Applicator \_\_\_\_\_ Industrial Applicator \_\_\_\_\_

Pesticide Handler \_\_\_\_\_ Agricultural Applicator \_\_\_\_\_ Adviser \_\_\_\_\_ Other \_\_\_\_\_

*Your certificate will be mailed to you in about two weeks.*

**Technical Learning College TLC PO Box 3060, Chino Valley, AZ 86323**  
**Toll Free (866) 557-1746 Fax (928) 272-0747 email info@tlch2o.com**

If you've paid on the Internet, please write your Customer # \_\_\_\_\_

We'll e-mail you the certificate of completion. Please provide an e-mail address.

## Important Information about this Course (Disclaimer Notice)

This CEU course has been prepared to educate pesticide applicators and operators in general safety awareness of dealing with the often-complex and various pesticide treatment sprays, devices, methods, and applications. This course (manual) will cover general laws, regulations, required procedures and accepted policies relating to the use of pesticides and herbicides. It should be noted, however, that the regulation of pesticides and hazardous materials is an ongoing process and subject to change over time. For this reason, a list of resources is provided to assist in obtaining the most up-to-date information on various subjects. This manual is not a guidance document for applicators or operators who are involved with pesticides. It is not designed to meet the requirements of the United States Environmental Protection Agency or your local State environmental protection agency or health department. This course manual will provide general pesticide safety awareness and should not be used as a basis for pesticide treatment method/device guidance. This document is not a detailed pesticide informational manual or a source or remedy for poison control.

Technical Learning College or Technical Learning Consultants, Inc. makes no warranty, guarantee or representation as to the absolute correctness or appropriateness of the information in this manual and assumes no responsibility in connection with the implementation of this information. It cannot be assumed that this manual contains all measures and concepts required for specific conditions or circumstances. This document should be used for educational purposes only and is not considered a legal document. Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Confine chemicals to the property or plants being treated. Avoid drift onto neighboring properties, especially gardens containing fruits and/or vegetables ready to be picked. Dispose of empty containers carefully. Follow label instructions for disposal. Never reuse containers. Make sure empty containers are not accessible to children or animals. Never dispose of containers where they may contaminate water supplies or natural waterways. Do not pour down sink or toilet. Consult your county agricultural commissioner for correct ways of disposing of excess pesticides. You should never burn pesticide containers.

Individuals who are responsible for pesticide storage, mixing and application should obtain and comply with the most recent federal, state, and local regulations relevant to these sites and are urged to consult with the EPA and other appropriate federal, state and local agencies.

**USE PESTICIDES WISELY:** ALWAYS READ THE ENTIRE PESTICIDE LABEL CAREFULLY, FOLLOW ALL MIXING AND APPLICATION INSTRUCTIONS AND WEAR ALL RECOMMENDED PERSONAL PROTECTIVE GEAR AND CLOTHING. CONTACT YOUR STATE DEPARTMENT OF AGRICULTURE FOR ANY ADDITIONAL PESTICIDE USE REQUIREMENTS, RESTRICTIONS OR RECOMMENDATIONS.

**NOTICE:** MENTION OF PESTICIDE PRODUCTS IN THIS COURSE DOES NOT CONSTITUTE ENDORSEMENT OF ANY MATERIAL OR HERB OR HERBAL SUPPLEMENT. ALWAYS FOLLOW THE PRODUCT'S LABEL INSTRUCTIONS.

### **NOTICE**

I fully understand that this type of study program deals with dangerous conditions and that I will not hold Technical Learning College, Technical Learning Consultants, Inc. (TLC) liable for any errors, omissions, advice, suggestions or neglect contained in this CEU education training course or for any violation or injury, death, neglect, damage or loss of your license or certification caused in any fashion by this CEU education training or course material suggestion or error. It is my responsibility to call or contact TLC if I need help or assistance and double-check to ensure my registration page and assignment has been received and graded. It is my responsibility to ensure all information is correct and to abide with all rules and regulations.

### **Grading Information**

In order to maintain the integrity of our courses we do not distribute test scores, percentages or questions missed. Our exams are based upon pass/fail criteria with the benchmark for successful completion set at 70%. Once you pass the exam, your record will reflect a successful completion and a certificate will be issued to you.

***We will stop mailing the certificate of completion we need your e-mail address.  
We will e-mail the certificate to you, if no e-mail address; we will mail it to you.***

# African Honey Bee CEU Training Course Answer Key

Name \_\_\_\_\_ Phone# \_\_\_\_\_

You are solely responsible in ensuring that this course is accepted by your State for credit. Did you check with your State agency to ensure this course is accepted for credit?

*Method of Course acceptance confirmation. Please fill this section*

Website \_\_\_ Telephone Call \_\_\_ Email \_\_\_ Spoke to \_\_\_\_\_

Did you receive the approval number, if applicable? \_\_\_\_\_

What is the course approval number, if applicable? \_\_\_\_\_

*You are responsible to ensure that TLC receives the Assignment and Registration Key. Please call us to ensure that we received it.*

**Multiple Choice. Pick only one answer per question.**

**Circle or Mark off or Bold the answer. Please circle the number of the assignment version 1 or 2 or 3 or 4 or 5**

## Topic 1 Bee Introduction

Ten Questions

- |                |                 |
|----------------|-----------------|
| 1. A B C D E F | 6. A B C D E F  |
| 2. A B C D E F | 7. A B C D E F  |
| 3. A B C D E F | 8. A B C D E F  |
| 4. A B C D E F | 9. A B C D E F  |
| 5. A B C D E F | 10. A B C D E F |

## Topic 2 Bees and Related Bee-Like Insects

Ten Questions

- |                |                 |
|----------------|-----------------|
| 1. A B C D E F | 6. A B C D E F  |
| 2. A B C D E F | 7. A B C D E F  |
| 3. A B C D E F | 8. A B C D E F  |
| 4. A B C D E F | 9. A B C D E F  |
| 5. A B C D E F | 10. A B C D E F |

### **Topic 3 Bee Control Section**

Ten Questions

- |                |                 |
|----------------|-----------------|
| 1. A B C D E F | 6. A B C D E F  |
| 2. A B C D E F | 7. A B C D E F  |
| 3. A B C D E F | 8. A B C D E F  |
| 4. A B C D E F | 9. A B C D E F  |
| 5. A B C D E F | 10. A B C D E F |

### **Topic 4 Wasp Section**

Ten Questions

- |                |                 |
|----------------|-----------------|
| 1. A B C D E F | 6. A B C D E F  |
| 2. A B C D E F | 7. A B C D E F  |
| 3. A B C D E F | 8. A B C D E F  |
| 4. A B C D E F | 9. A B C D E F  |
| 5. A B C D E F | 10. A B C D E F |

**Complete all the Topical Sections before submitting the answer key**

**Amount of Time for Course Completion – How many hours you spent on course?**

**Must match State Hour Requirement \_\_\_\_\_ (Hours)**

Please fax or email this answer key and the registration Page to TLC.  
Call 15 minutes later to ensure we have received the paperwork

**A second certificate of completion for a second State Agency \$50 processing fee.**

**All downloads are electronically tracked and monitored for security purposes.**

**No refunds.**

*Please e-mail or fax this survey along with your final exam*

**AFRICAN HONEY BEE CEU COURSE  
PROFESSIONAL DEVELOPMENT COURSE**

*CUSTOMER SERVICE RESPONSE CARD*

NAME: \_\_\_\_\_

E-MAIL \_\_\_\_\_ PHONE \_\_\_\_\_

**PLEASE COMPLETE THIS FORM BY CIRCLING THE NUMBER OF THE APPROPRIATE ANSWER IN THE AREA BELOW.**

1. Please rate the difficulty of your course.  
Very Easy 0 1 2 3 4 5 Very Difficult

2. Please rate the difficulty of the testing process.  
Very Easy 0 1 2 3 4 5 Very Difficult

3. Please rate the subject matter on the exam to your actual field or work.  
Very Similar 0 1 2 3 4 5 Very Different

4. How did you hear about this Course? \_\_\_\_\_

5. What would you do to improve the Course?  
\_\_\_\_\_  
\_\_\_\_\_

How about the price of the course?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

How was your customer service?

Poor \_\_\_\_\_ Fair \_\_\_\_\_ Average \_\_\_\_\_ Good \_\_\_\_\_ Great \_\_\_\_\_

Any other concerns or comments.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

## **AFFIDAVIT OF EXAM COMPLETION**

I affirm that I personally completed the entire text of the course.

I also affirm that I completed the exam without assistance from any outside source.

I understand that it is my responsibility to file or maintain my certificate of completion as required by the state or by the designation organization.

## **INSTRUCTIONS**

1. We will require all students to fax or e-mail a copy of their driver's license with the registration form.
2. You will need to pick one of the following four assignments to complete. This selection process is based upon your last name.

### **Assignment for Last Names**

*If your last name...*

**T-Z Assignment #1 Pages 7-14**

**N-S Assignment #2 Pages 15-21**

**H-M Assignment #3 Pages 23-29**

**A-G Assignment #4 Pages 31-37**

**Alternative Assignment #5 for repeat students Pages 39-45**

**These exams are frequently rotated.  
Complete all topics before submitting the answers key.**

### **Rush Grading Service**

If you need this assignment graded and the results mailed to you within a 48-hour period, prepare to pay an additional rush service handling fee of \$50.00. This fee may not cover postage costs. If you need this service, simply write RUSH on the top of your Registration Form. We will place you in the front of the grading and processing line.

***Please fax or e-mail the registration form, answer key and a copy of your driver's license. Always call us to ensure we've received the materials.***

# African Honey Bee CEU Training Course Assignment #1

## Last Names T-Z

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

### Topic 1 Bee Introduction Final Examination

#### Fill-In-the-blank

#### The Waggle Dance

1. The other bees take in the information by keeping in close contact with the dancing bee and reconstructing its movements. They also receive information via their sense of smell about what is to be found at the food source (type of food, pollen, propolis, water) as well as its specific characteristics. \_\_\_\_\_ so well that the bees can find a food source with the help of the waggle dance even if there are hindrances they must detour around like an intervening mountain.

- A. The orientation function(s)
- B. Defensive behavior
- C. The movement is
- D. The foraging
- E. The absconding
- F. None of the Above

#### Absconding

2. Absconding is usually the result of a severe disturbance, such as predator activity, flooding, starvation, or other major stress. Absconding bees may travel 30-50 miles before finding a suitable nest site. Long flights may have to be \_\_\_\_\_.

- A. Barbed so that when it stings
- B. Have to be forced to sting
- C. The cause of stinging incidents
- D. A defensive behavior
- E. Interrupted several times to forage for food
- F. None of the Above

#### Food Gathering

3. Worker bees forage for \_\_\_\_\_, pollen, propolis, and water. They bring these raw materials back to the colony for use or storage.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

4. \_\_\_\_\_ is converted from sucrose, a complex sugar, into fructose and glucose, simple sugars, by enzyme activity in the bee's "honey stomach." Then it is dehydrated from 60 to 65 percent water to the 17 to 20 percent water found in ripe honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

5. Worker bees also forage for propolis, often called "\_\_\_\_\_."

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

6. Propolis is a mixture of tree resins and \_\_\_\_\_. It is used to secure and seal cracks and crevices within the colony. Water is collected by foragers and has three important functions in the colony: to dilute thick honey, to maintain the desired humidity in the hive, and to maintain the proper temperature.
- A. Honey
  - B. Propolis
  - C. Pollen
  - D. Water
  - E. Nectar
  - F. None of the Above

### Defensive Behavior

7. \_\_\_\_\_ that have a tendency to increase the defensive behavior of bees include sudden and rapid movements, jarring or bumping hives or frames, vibrations and noise such as operating lawn mowers or tractors, odors (both good and bad), and dark colors. Bees are also more defensive in cooler, cloudy weather.
- A. Waggle dance
  - B. Defensive behavior
  - C. Stimuli
  - D. Foraging
  - E. Absconding
  - F. None of the Above

### The Africanization of the Honey Bee

8. The Africanized honey bee is simply \_\_\_\_\_, a result of breeding the European honey bee, *Apis mellifera mellifera*, with the African honey bee, *Apis mellifera scutellata*. The genetic differences in the hybrid Africanized bee make its habits different from those of the domestic European honey bee cultured in the United States.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. Worker bees
  - D. A hybrid honey bee
  - E. European honey bee, *Apis mellifera mellifera*, or EHB
  - F. None of the Above

### Honey Bee Breeding

9. For more than 300 years honey bees have been bred in the Americas. Honey bee breeding programs have used genetic material from all over the world, including Africa, but have concentrated mostly on \_\_\_\_\_. Desired characteristics include winter hardiness, tendency not to swarm, gentleness, low drone production, and other valuable traits.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. Worker bees
  - D. African honey bee, *Apis mellifera scutellata*, or AHB
  - E. European strains
  - F. None of the Above
10. The African strain of the honey bee is a tropical bee and has been selected by nature more than by man. African bee strains tend to be more defensive, swarm more often, and don't conform as well to our \_\_\_\_\_ management practices.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. "American" bee
  - D. African honey bee, *Apis mellifera scutellata*, or AHB
  - E. European honey bee, *Apis mellifera mellifera*, or EHB
  - F. None of the Above

## Topic 2 Bees and Related Bee-Like Insects

### Fill-In-the-blank

#### How Bees Make Honey

1. Bees actually have two stomachs, their honey stomach which they use like a \_\_\_\_\_ backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.
- A. Honey
  - B. Propolis
  - C. Pollen
  - D. Water
  - E. Nectar
  - F. None of the Above



2. The honeybees return to the hive and pass the \_\_\_\_\_ onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

3. During this time, enzymes are breaking the complex sugars in the nectar into \_\_\_\_\_ so that it is both more digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

4. The bees make the nectar dry even faster by fanning it with their wings. Once the honey is gooey enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 120 and 200 pounds of \_\_\_\_\_.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

#### **Carbohydrate Element**

5. \_\_\_\_\_ form the energy (or carbohydrate) element of the bees' diet while pollen forms the proteinaceous part of their diet. Both pollen and nectar are essential to normal colony growth. Without nectar the colony has no energy with which to perform its normal tasks and without pollen young bees cannot be reared.

- A. Honey
- B. Propolis
- C. Pollen
- D. Nectar and honey
- E. Nectar
- F. None of the Above

#### **Prevention of Absconding**

6. Where bees abscond frequently it is an indication that food, probably nectar is limited within the environment. Feeding bees is common in temperate bees; perhaps where the bees have collected insufficient honey or perhaps where too much honey has been harvested from a colony. In these cases the feeding of \_\_\_\_\_ will enable bees to survive a long period of dearth.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. \_\_\_\_\_ is NOT suitable for feeding bees as they lack the enzymes to deal with the complex sugars that remain in the unrefined sugar and will die of dysentery.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

#### **Feeding Pollen**

8. Feeding pollen is also practiced in areas where pollen is limited. This is most likely to be in the monoculture agricultural landscapes that are associated with large-scale industrialized farming. There are many places in the world where there is plenty of forage, \_\_\_\_\_. The level of bee absconding and ease of colonization is probably an indicator of the richness and health of the environment (for the people who live there as well as the bees).

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

9. Feeding \_\_\_\_\_ is normally practiced at the start of the colony build up period. This is the time when protein demands will be highest as the bees are rearing large numbers of young brood. If the colony build up seems unusual and there are no signs of pollen in the colony then it is possible that supplementary pollen feeding may be helpful. If beekeepers believe either pollen or nectar shortage is affecting the bees, the first line of investigation should be the availability of enough suitable tree species and the implementation of a planting program if possible.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

### **New Colonies**

10. Hives should have a volume, according to \_\_\_\_\_ flow, between 80 and 150 liters. Traditional hives should have an opening at the back side, for inspection and harvesting, far from the brood, which is positioned near the bee entrance.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

## **Topic 3 Bee Control Section**

### **Fill-In-the-blank**

#### **Bee Swarms**

1. A swarm of honey bees is a temporary inconvenience that may last a few hours or days. Honey bees in a swarm are usually gentle because they have stomachs full of \_\_\_\_\_. If left undisturbed, a swarm will locate new quarters and often disappear as quickly as it appeared. In the past, local beekeepers collected swarms to put into their unused hives. They would at times charge a nominal fee for their time and effort.

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

#### **Bees in Buildings**

2. Simply killing the bees will only make for more complex problems in the future. For instance, an unattended nest of \_\_\_\_\_ will attract other insects and animals. Wax moths will enter to consume the wax, cockroaches and ants will find the brood and honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

3. Decaying brood and fermenting honey will cause undesirable odors. \_\_\_\_\_ can soak into walls, making them impossible to paint or wallpaper. Walls will also remain moist to the touch for a considerable period of time. If removing the bees and their nest is not practical, then other methods of dealing with them can be considered.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

#### **Avoiding Bee Problems**

4. Most serious incidents involving bees can be avoided with a little effort. In areas where the \_\_\_\_\_ has become established, people should learn the basics about bees and their habits. When activities increase the possibility of interaction with bees, care should be taken to reduce incidents.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

### General Bee Control and Treatments

5. In some cases, attempting to destroy a nest becomes a greater health risk than simply tolerating and avoiding it. But nests, especially those of social species, should be destroyed if they are close enough to humans to pose a stinging threat. The nests of honey bees, bumble bees, yellowjackets and hornets should always be approached with caution, preferably at night when most of the workers are present but \_\_\_\_\_.

- A. Create Colony Collapse Disorder
- B. Reluctant to fly
- C. Will swarm
- D. Nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

6. \_\_\_\_\_ is a natural bee insecticide. This effective bee killer is a dust that sticks to the legs and bodies of bees. Once on their legs and bodies, bees unwittingly carry it into their hives or nests and poison the rest of the colony.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. Sprinkle \_\_\_\_\_ on the ground around ground nesting sites, at the entrances of hives and nests, or, when dealing with honeybees in the walls, directly into hives via holes drilled through the wall and into the side of the hive.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

8. \_\_\_\_\_ are not generally used to destroy entire bee colonies. Instead, as they only kill the bees that get sprayed directly, pyrethrins are usually just used to keep populations from getting too out of hand. Microcare Aerosol is a good brand.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

### Specific Bee Treatments

9. Certain pesticides are harmful to bees. That's why we require instructions for protecting bees on the labels of pesticides that are known to be particularly harmful to bees. This is one of many reasons why everyone must read and follow pesticide label instructions. When most or all of the bees in a hive are killed by overexposure to a pesticide, we call that a bee kill incident resulting from acute pesticide poisoning. \_\_\_\_\_ from Colony Collapse Disorder and is almost always avoidable.

- A. But acute pesticide poisoning of a hive is very different
- B. Ground nesting sites
- C. Swarming
- D. But nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

10. Pesticides can affect honey bees in different ways. Some kill bees on contact in the field; others may cause brood damage or contaminate pollen, thus killing house bees. Before dying, poisoned bees can become irritable (likely to sting), paralyzed or stupefied, appear to be 'chilled' or exhibit other abnormal behavior. \_\_\_\_\_ are likely to be superseded when a colony is being poisoned.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

## Topic 4 Wasp Section

### Fill-In-the-blank

#### Mud Dauber (*Sceliphron caementarium*)

1. This is a common wasp. Females build a mud nest of cells laid side by side usually in a series of two to six, on the sides and eaves of buildings. The adults are mostly black with a yellow waist and legs. Many solitary wasps fall into the group of '\_\_\_\_\_ ' and what distinguishes them is that they build nesting sites out of mud. There is the black and yellow dauber, blue, potter's wasp, organ pipe and many more. Usually their name depicts the shape of the nest they build but sometimes it simply refers to their colors or marking.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasp(s)
- E. Mud dauber(s)
- F. None of the Above

#### Umbrella Wasps (*Polistes* spp. and *Mischocyttarus flavitarsis*)

2. Umbrella wasps are also commonly referred to as \_\_\_\_\_. These wasps have been named umbrella wasps because their nests are the shape of an inverted umbrella. They usually have small nests and are usually inhabited by about 250 wasps.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasp(s)
- E. Mud dauber(s)
- F. None of the Above

3. Unlike many other wasps and yellowjackets, Umbrella wasps do not have a worker caste. All female wasps are capable of becoming the queen. Umbrella wasp nests do not have a paper envelope around them and are only a single comb. \_\_\_\_\_ usually hang their nests in eaves, attics, and sheds. Knocking down the nest is a waste of time because the wasps will rebuild it. Therefore, the wasps themselves must be destroyed.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasps
- E. Mud dauber(s)
- F. None of the Above

#### Hibernate Underground

4. As winter approaches, the wasps die – except any just-fertilized queens. These hibernate underground, under logs or in hollow trees until spring. The nest itself is generally abandoned by winter, and will not be reused. When spring arrives, the young queens emerge and the cycle begins again. \_\_\_\_\_ visit flowers, especially in late summer, and can be minor pollinators.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasps
- E. Mud dauber(s)
- F. None of the Above

5. \_\_\_\_\_ is available in both liquid and wettable powder concentrates.

- A. DE
- B. Chemicals alone
- C. Cypermethrin
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

#### Apply Pesticide when Bees are not Flying

6. Besides wasps any of these products can be used for general purpose pest control in and around the home. Liquid concentrates are more cost effective for this particular job. If you are positive that you are dealing with only one nest, a 4 ounce bottle of \_\_\_\_\_ concentrate may be all that you will need, especially if you have no other pest control needs.

- A. DE
- B. Cypermethrin
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. There are three different sizes of liquid concentrate Cypermethrin: 4 ounce, 16 ounce, and 32 ounce. If you do not intend on doing your own general household pest control, you will usually not need the larger containers. Only when there is a great deal of landscape area to deal with will you need larger volumes of liquid insecticides. In this case, \_\_\_\_\_ is your best bet. For smaller jobs, buy one or two 4 ounce bottles of Cypermethrin. Always follow the label instructions.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

#### **Choosing Pest Products**

8. There are two different dusts that will work: Drione Dust and \_\_\_\_\_. The advantage of Drione Dust is that it has a very fast knock-down or kill of targeted pests.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

9. Delta Dust has the advantage of being water-proof, an asset that is very attractive when treating soil that might contain any type of moisture. \_\_\_\_\_ is the more popular of the two insecticides.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

#### **Application of Pest Products**

10. If large amounts of \_\_\_\_\_ are merely "dumped" into the nest entrance, the majority of the dust will merely pile up in one place. Properly applied dust will "float" through the chambers and most of the particles will tend to stick to top, bottom and sides of the tunnel as well as the nest itself.

- A. Deltamethrin (Delta Dust or Drione Dust)
- B. Chemicals alone
- C. Other insecticidal dusts
- D. Drione Dust
- E. Fenvalerate
- F. None of the Above



## African Honey Bee CEU Training Course Assignment #2

### Last Names N-S

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### Topic 1 Bee Introduction Final Examination

#### Fill-In-the-blank

#### Genus Apis

1. Colonies are established not by solitary queens, as in most bees, but by groups known as "swarms", which consist of a mated queen and a large contingent of worker bees. This group moves en masse to a nest site that has been scouted by worker bees beforehand. Once they arrive, they immediately construct a new wax comb and begin to raise new \_\_\_\_\_ brood.

- A. Solitary queen(s)
- B. Worker
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### Biology and Habits of the Honey Bee

2. The honey bee undergoes complete metamorphosis, passing through four stages: egg, larva, pupa, and adult. Bees develop into three different castes: \_\_\_\_\_, queens, and drones.

- A. Solitary queen(s)
- B. Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

3. At first their body is soft, but the \_\_\_\_\_ hardens in about 12-24 hours. During the next few days, glands and reproductive organs (in the queens and drones) develop and mature.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

4. Drones produce semen in about 12 days and \_\_\_\_\_ begin to lay eggs about three days after mating.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### Virgin Queens

5. When mature, virgin queens take a mating flight and mate with 10-15 \_\_\_\_\_. In about three days the queen begins to lay eggs.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

6. Fertilized eggs develop into females (workers) and unfertilized eggs develop into \_\_\_\_\_. About 99 percent of the eggs laid by a queen are fertilized and develop into workers.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

### The Waggle Dance

7. The other bees take in the information by keeping in close contact with the dancing bee and reconstructing its movements. They also receive information via their sense of smell about what is to be found at the food source (type of food, pollen, propolis, water) as well as its specific characteristics. \_\_\_\_\_ so well that the bees can find a food source with the help of the waggle dance even if there are hindrances they must detour around like an intervening mountain.

- A. The orientation function(s)
- B. Defensive behavior
- C. The movement is
- D. The foraging
- E. The absconding
- F. None of the Above

### Absconding

8. Absconding is usually the result of a severe disturbance, such as predator activity, flooding, starvation, or other major stress. Absconding bees may travel 30-50 miles before finding a suitable nest site. Long flights may have to be \_\_\_\_\_.

- A. Barbed so that when it stings
- B. Have to be forced to sting
- C. The cause of stinging incidents
- D. A defensive behavior
- E. Interrupted several times to forage for food
- F. None of the Above

### Food Gathering

9. Worker bees forage for \_\_\_\_\_, pollen, propolis, and water. They bring these raw materials back to the colony for use or storage.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

10. \_\_\_\_\_ is converted from sucrose, a complex sugar, into fructose and glucose, simple sugars, by enzyme activity in the bee's "honey stomach." Then it is dehydrated from 60 to 65 percent water to the 17 to 20 percent water found in ripe honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

## Topic 2 Bees and Related Bee-Like Insects

### Fill-In-the-blank

#### How Bees Make Honey

1. Bees actually have two stomachs, their honey stomach which they use like a \_\_\_\_\_ backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

2. The honeybees return to the hive and pass the \_\_\_\_\_ onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above



3. During this time, enzymes are breaking the complex sugars in the nectar into \_\_\_\_\_ so that it is both more digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

4. The bees make the nectar dry even faster by fanning it with their wings. Once the honey is gooey enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 120 and 200 pounds of \_\_\_\_\_.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

### Carbohydrate Element

5. \_\_\_\_\_ form the energy (or carbohydrate) element of the bees' diet while pollen forms the proteinaceous part of their diet. Both pollen and nectar are essential to normal colony growth. Without nectar the colony has no energy with which to perform its normal tasks and without pollen young bees cannot be reared.

- A. Honey
- B. Propolis
- C. Pollen
- D. Nectar and honey
- E. Nectar
- F. None of the Above

### Prevention of Absconding

6. Where bees abscond frequently it is an indication that food, probably nectar is limited within the environment. Feeding bees is common in temperate bees; perhaps where the bees have collected insufficient honey or perhaps where too much honey has been harvested from a colony. In these cases the feeding of \_\_\_\_\_ will enable bees to survive a long period of dearth.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. \_\_\_\_\_ is NOT suitable for feeding bees as they lack the enzymes to deal with the complex sugars that remain in the unrefined sugar and will die of dysentery.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

### Feeding Pollen

8. Feeding pollen is also practiced in areas where pollen is limited. This is most likely to be in the monoculture agricultural landscapes that are associated with large-scale industrialized farming. There are many places in the world where there is plenty of forage, \_\_\_\_\_. The level of bee absconding and ease of colonization is probably an indicator of the richness and health of the environment (for the people who live there as well as the bees).

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

9. Feeding \_\_\_\_\_ is normally practiced at the start of the colony build up period. This is the time when protein demands will be highest as the bees are rearing large numbers of young brood.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

### New Colonies

10. Hives should have a volume, according to \_\_\_\_\_ flow, between 80 and 150 liters. Traditional hives should have an opening at the back side, for inspection and harvesting, far from the brood, which is positioned near the bee entrance.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

### Topic 3 Bee Control Section

#### Fill-In-the-blank

#### Bee Swarms

1. A swarm of honey bees is a temporary inconvenience that may last a few hours or days. Honey bees in a swarm are usually gentle because they have stomachs full of \_\_\_\_\_. If left undisturbed, a swarm will locate new quarters and often disappear as quickly as it appeared. In the past, local beekeepers collected swarms to put into their unused hives. They would at times charge a nominal fee for their time and effort.

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

#### Bees in Buildings

2. Simply killing the bees will only make for more complex problems in the future. For instance, an unattended nest of \_\_\_\_\_ will attract other insects and animals. Wax moths will enter to consume the wax, cockroaches and ants will find the brood and honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

3. Decaying brood and fermenting honey will cause undesirable odors. \_\_\_\_\_ can soak into walls, making them impossible to paint or wallpaper. Walls will also remain moist to the touch for a considerable period of time. If removing the bees and their nest is not practical, then other methods of dealing with them can be considered.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

#### Avoiding Bee Problems

4. Most serious incidents involving bees can be avoided with a little effort. In areas where the \_\_\_\_\_ has become established, people should learn the basics about bees and their habits. When activities increase the possibility of interaction with bees, care should be taken to reduce incidents.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

#### General Bee Control and Treatments

5. In some cases, attempting to destroy a nest becomes a greater health risk than simply tolerating and avoiding it. But nests, especially those of social species, should be destroyed if they are close enough to humans to pose a stinging threat. The nests of honey bees, bumble bees, yellowjackets and hornets should always be approached with caution, preferably at night when most of the workers are present but \_\_\_\_\_.

- A. Create Colony Collapse Disorder
- B. Reluctant to fly
- C. Will swarm
- D. Nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

6. \_\_\_\_\_ is a natural bee insecticide. This effective bee killer is a dust that sticks to the legs and bodies of bees. Once on their legs and bodies, bees unwittingly carry it into their hives or nests and poison the rest of the colony.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. Sprinkle \_\_\_\_\_ on the ground around ground nesting sites, at the entrances of hives and nests, or, when dealing with honeybees in the walls, directly into hives via holes drilled through the wall and into the side of the hive.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

8. \_\_\_\_\_ are not generally used to destroy entire bee colonies. Instead, as they only kill the bees that get sprayed directly, pyrethrins are usually just used to keep populations from getting too out of hand. Microcare Aerosol is a good brand.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

### Specific Bee Treatments

9. Certain pesticides are harmful to bees. That's why we require instructions for protecting bees on the labels of pesticides that are known to be particularly harmful to bees. This is one of many reasons why everyone must read and follow pesticide label instructions. When most or all of the bees in a hive are killed by overexposure to a pesticide, we call that a bee kill incident resulting from acute pesticide poisoning. \_\_\_\_\_ from Colony Collapse Disorder and is almost always avoidable.

- A. But acute pesticide poisoning of a hive is very different
- B. Ground nesting sites
- C. Swarming
- D. But nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

10. Pesticides can affect honey bees in different ways. Some kill bees on contact in the field; others may cause brood damage or contaminate pollen, thus killing house bees. Before dying, poisoned bees can become irritable (likely to sting), paralyzed or stupefied, appear to be 'chilled' or exhibit other abnormal behavior. \_\_\_\_\_ are likely to be superseded when a colony is being poisoned.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

## Topic 4 Wasp Section

### Fill-In-the-blank

#### Yellowjackets

1. The social wasps can be fractured into 2 groups, the Yellowjackets / Hornets and Paper wasps. Most of these wasps feed on insect pests eliminating large numbers of them. \_\_\_\_\_ feed abundantly on armyworms, corn earworms and other ag pests.

- A. Hornet(s)
- B. Honey bee
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. The social wasp(s)
- F. None of the Above

2. Hornets will take house flies, blow flies and caterpillars. Other Yellowjacket species are exclusively scavengers. Unless they nest or are active near human activities, it's best to leave them alone. But unlike \_\_\_\_\_, these wasps can become very defensive when their nests are disturbed. Loud noises such as a lawnmower, vibration from even footsteps or just coming too close to a nest can elicit a defensive response.

- A. Hornet(s)
- B. Honey bee
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. The social wasp(s)
- F. None of the Above

3. Workers forage mainly for protein at this time—usually in the form of other insects—and for some sugars. By late summer, however, the colonies grow more slowly or cease growth and require large amounts of sugar to maintain \_\_\_\_\_, so foraging wasps are particularly interested in sweet things at this time.

- A. Solitary queen(s)
- B. Worker
- C. Queen(s)
- D. The queen and workers
- E. Drones or Males
- F. None of the Above

#### Eastern Yellowjacket (*Vespula maculifrons*)

4. Most yellowjackets have very slightly barbed stingers but the sting will not set in the victim's tissue like the barbed stinger of the honey bee. The stinger of \_\_\_\_\_, however, often sticks and when the insect is slapped off, the stinger may remain.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

5. Aerial-nesting yellowjackets, \_\_\_\_\_, build paper nests that they attach to the eaves of a building or that hang from the limb of a tree. The entrance normally is a hole at the bottom of the nest. These aerial nesters don't become scavengers at the end of the season, but they are extremely defensive when their nests are disturbed. Defending *D. arenaria* sometimes bite and/or sting, simultaneously.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

6. Wasp stingers have no barbs and can be used repeatedly, especially when the wasp gets inside clothing. As with any \_\_\_\_\_, it is best to leave the area of the nest site as quickly as possible if wasps start stinging.

- A. Food gathering habits
- B. Attack
- C. Threat
- D. Minor pollinators
- E. Stinging incident
- F. None of the Above

### **Aerial Nesters**

7. The \_\_\_\_\_ is larger than the other yellowjackets and is black and white -- not black and yellow. It lives along the west coast, across Canada, and in all of the states in the eastern half of the country.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

### **Other Wasps**

#### **Blue Mud Wasp (*Chalybion californicum*)**

8. This wasp is a "poor relative" of the Mud Dauber. The females use vacant mud wasp nests. They hunt on the ground, preying mainly on \_\_\_\_\_. Adults are metallic blue, blue green or bluish black.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

### **Hibernate Underground**

9. As winter approaches, the wasps die – except any just-fertilized queens. These hibernate underground, under logs or in hollow trees until spring. The nest itself is generally abandoned by winter, and will not be reused. When spring arrives, the young queens emerge and the cycle begins again.

\_\_\_\_\_ visit flowers, especially in late summer, and can be minor pollinators.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasps
- E. Mud dauber(s)
- F. None of the Above

### **Treating Nests beneath Grass, Mulch**

10. Treating nests in covered or over-grown areas is best done by first broadcasting an insecticide over the area. This is especially important when the entrance hole is not visible due to loose materials. The area should be fairly well drenched both on and around the suspected entrance to the nest. Products containing \_\_\_\_\_ work well for this job.

- A. DE
- B. Chemicals alone
- C. Cypermethrin
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above



## African Honey Bee CEU Training Course Assignment #3

### Last Names H-M

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- A. Solitary queen(s)
- B. Worker
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### Biology and Habits of the Honey Bee

2. At first their body is soft, but the \_\_\_\_\_ hardens in about 12-24 hours. During the next few days, glands and reproductive organs (in the queens and drones) develop and mature.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### Virgin Queens

3. When mature, virgin queens take a mating flight and mate with 10-15 \_\_\_\_\_. In about three days the queen begins to lay eggs.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### The Waggle Dance

4. The other bees take in the information by keeping in close contact with the dancing bee and reconstructing its movements. They also receive information via their sense of smell about what is to be found at the food source (type of food, pollen, propolis, water) as well as its specific characteristics. \_\_\_\_\_ so well that the bees can find a food source with the help of the waggle dance even if there are hindrances they must detour around like an intervening mountain.

- A. The orientation function(s)
- B. Defensive behavior
- C. The movement is
- D. The foraging
- E. The absconding
- F. None of the Above

#### Food Gathering

5. Worker bees forage for \_\_\_\_\_, pollen, propolis, and water. They bring these raw materials back to the colony for use or storage.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

6. \_\_\_\_\_ is converted from sucrose, a complex sugar, into fructose and glucose, simple sugars, by enzyme activity in the bee's "honey stomach." Then it is dehydrated from 60 to 65 percent water to the 17 to 20 percent water found in ripe honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. Worker bees also forage for propolis, often called "\_\_\_\_\_."

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

8. Propolis is a mixture of tree resins and \_\_\_\_\_. It is used to secure and seal cracks and crevices within the colony. Water is collected by foragers and has three important functions in the colony: to dilute thick honey, to maintain the desired humidity in the hive, and to maintain the proper temperature.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

### Defensive Behavior

9. \_\_\_\_\_ that have a tendency to increase the defensive behavior of bees include sudden and rapid movements, jarring or bumping hives or frames, vibrations and noise such as operating lawn mowers or tractors, odors (both good and bad), and dark colors. Bees are also more defensive in cooler, cloudy weather.

- A. Waggle dance
- B. Defensive behavior
- C. Stimuli
- D. Foraging
- E. Absconding
- F. None of the Above

10. The African strain of the honey bee is a tropical bee and has been selected by nature more than by man. African bee strains tend to be more defensive, swarm more often, and don't conform as well to our \_\_\_\_\_ management practices.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

## Topic 2 Bees and Related Bee-Like Insects

### Fill-In-the-blank

#### How Bees Make Honey

1. Bees actually have two stomachs, their honey stomach which they use like a \_\_\_\_\_ backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

2. The honeybees return to the hive and pass the \_\_\_\_\_ onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above



3. During this time, enzymes are breaking the complex sugars in the nectar into \_\_\_\_\_ so that it is both more digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

4. The bees make the nectar dry even faster by fanning it with their wings. Once the honey is gooey enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 120 and 200 pounds of \_\_\_\_\_.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

### Carbohydrate Element

5. \_\_\_\_\_ form the energy (or carbohydrate) element of the bees' diet while pollen forms the proteinaceous part of their diet. Both pollen and nectar are essential to normal colony growth. Without nectar the colony has no energy with which to perform its normal tasks and without pollen young bees cannot be reared.

- A. Honey
- B. Propolis
- C. Pollen
- D. Nectar and honey
- E. Nectar
- F. None of the Above

### Prevention of Absconding

6. Where bees abscond frequently it is an indication that food, probably nectar is limited within the environment. Feeding bees is common in temperate bees; perhaps where the bees have collected insufficient honey or perhaps where too much honey has been harvested from a colony. In these cases the feeding of \_\_\_\_\_ will enable bees to survive a long period of dearth.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. \_\_\_\_\_ is NOT suitable for feeding bees as they lack the enzymes to deal with the complex sugars that remain in the unrefined sugar and will die of dysentery.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

### Feeding Pollen

8. Feeding pollen is also practiced in areas where pollen is limited. This is most likely to be in the monoculture agricultural landscapes that are associated with large-scale industrialized farming. There are many places in the world where there is plenty of forage, \_\_\_\_\_. The level of bee absconding and ease of colonization is probably an indicator of the richness and health of the environment (for the people who live there as well as the bees).

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

9. Feeding \_\_\_\_\_ is normally practiced at the start of the colony build up period. This is the time when protein demands will be highest as the bees are rearing large numbers of young brood. If the colony build up seems unusual and there are no signs of pollen in the colony then it is possible that supplementary pollen feeding may be helpful.

- A. Honey
- B. Propolis
- D. Vegetational nectar
- E. Nectar

- C. Pollen      F. None of the Above

### **New Colonies**

10. Hives should have a volume, according to \_\_\_\_\_ flow, between 80 and 150 liters. Traditional hives should have an opening at the back side, for inspection and harvesting, far from the brood, which is positioned near the bee entrance.

- A. Honey      D. Vegetational nectar  
B. Propolis      E. Nectar  
C. Pollen      F. None of the Above

## **Topic 3 Bee Control Section**

### **Fill-In-the-blank**

#### **Bee Swarms**

1. A swarm of honey bees is a temporary inconvenience that may last a few hours or days. Honey bees in a swarm are usually gentle because they have stomachs full of \_\_\_\_\_. If left undisturbed, a swarm will locate new quarters and often disappear as quickly as it appeared. In the past, local beekeepers collected swarms to put into their unused hives. They would at times charge a nominal fee for their time and effort.

- A. Honey      D. Both nectar and pollen  
B. Propolis      E. Nectar  
C. Pollen      F. None of the Above

#### **Bees in Buildings**

2. Simply killing the bees will only make for more complex problems in the future. For instance, an unattended nest of \_\_\_\_\_ will attract other insects and animals. Wax moths will enter to consume the wax, cockroaches and ants will find the brood and honey.

- A. Honey      D. Melting wax and honey  
B. Propolis      E. Beeswax, honey, brood, and pollen  
C. Pollen      F. None of the Above

3. Decaying brood and fermenting honey will cause undesirable odors. \_\_\_\_\_ can soak into walls, making them impossible to paint or wallpaper. Walls will also remain moist to the touch for a considerable period of time. If removing the bees and their nest is not practical, then other methods of dealing with them can be considered.

- A. Honey      D. Melting wax and honey  
B. Propolis      E. Beeswax, honey, brood, and pollen  
C. Pollen      F. None of the Above

#### **Avoiding Bee Problems**

4. Most serious incidents involving bees can be avoided with a little effort. In areas where the \_\_\_\_\_ has become established, people should learn the basics about bees and their habits. When activities increase the possibility of interaction with bees, care should be taken to reduce incidents.

- A. Temperate honey bees      D. African honey bee, *Apis mellifera scutellata*, or AHB  
B. Tropical honey bees      E. European honey bee, *Apis mellifera mellifera*, or EHB  
C. "American" bee      F. None of the Above

#### **General Bee Control and Treatments**

5. In some cases, attempting to destroy a nest becomes a greater health risk than simply tolerating and avoiding it. But nests, especially those of social species, should be destroyed if they are close enough to humans to pose a stinging threat. The nests of honey bees, bumble bees, yellowjackets and hornets should always be approached with caution, preferably at night when most of the workers are present but \_\_\_\_\_.

- A. Create Colony Collapse Disorder      D. Nests, especially those of social species  
B. Reluctant to fly      E. New quarters and often disappear as quickly as it appeared  
C. Will swarm      F. None of the Above

6. \_\_\_\_\_ is a natural bee insecticide. This effective bee killer is a dust that sticks to the legs and bodies of bees. Once on their legs and bodies, bees unwittingly carry it into their hives or nests and poison the rest of the colony.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. Sprinkle \_\_\_\_\_ on the ground around ground nesting sites, at the entrances of hives and nests, or, when dealing with honeybees in the walls, directly into hives via holes drilled through the wall and into the side of the hive.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

8. \_\_\_\_\_ are not generally used to destroy entire bee colonies. Instead, as they only kill the bees that get sprayed directly, pyrethrins are usually just used to keep populations from getting too out of hand. Microcare Aerosol is a good brand.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

### Specific Bee Treatments

9. Certain pesticides are harmful to bees. That's why we require instructions for protecting bees on the labels of pesticides that are known to be particularly harmful to bees. This is one of many reasons why everyone must read and follow pesticide label instructions. When most or all of the bees in a hive are killed by overexposure to a pesticide, we call that a bee kill incident resulting from acute pesticide poisoning. \_\_\_\_\_ from Colony Collapse Disorder and is almost always avoidable.

- A. But acute pesticide poisoning of a hive is very different
- B. Ground nesting sites
- C. Swarming
- D. But nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

10. Pesticides can affect honey bees in different ways. Some kill bees on contact in the field; others may cause brood damage or contaminate pollen, thus killing house bees. Before dying, poisoned bees can become irritable (likely to sting), paralyzed or stupefied, appear to be 'chilled' or exhibit other abnormal behavior. \_\_\_\_\_ are likely to be superseded when a colony is being poisoned.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

## Topic 4 Wasp Section

### Fill-In-the-blank

#### Yellowjackets

1. The social wasps can be fractured into 2 groups, the Yellowjackets / Hornets and Paper wasps. Most of these wasps feed on insect pests eliminating large numbers of them. \_\_\_\_\_ feed abundantly on armyworms, corn earworms and other ag pests.

- A. Hornet(s)
- B. Honey bee
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. The social wasp(s)
- F. None of the Above

2. Workers forage mainly for protein at this time—usually in the form of other insects—and for some sugars. By late summer, however, the colonies grow more slowly or cease growth and require large amounts of sugar to maintain \_\_\_\_\_, so foraging wasps are particularly interested in sweet things at this time.

- A. Solitary queen(s)
- B. Worker
- C. Queen(s)
- D. The queen and workers
- E. Drones or Males
- F. None of the Above

### Eastern Yellowjacket (*Vespula maculifrons*)

3. Most yellowjackets have very slightly barbed stingers but the sting will not set in the victim's tissue like the barbed stinger of the honey bee. The stinger of \_\_\_\_\_, however, often sticks and when the insect is slapped off, the stinger may remain.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

### Aerial Nesters

4. The \_\_\_\_\_ is larger than the other yellowjackets and is black and white -- not black and yellow. It lives along the west coast, across Canada, and in all of the states in the eastern half of the country.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

### Mud Dauber (*Sceliphron caementarium*)

5. This is a common wasp. Females build a mud nest of cells laid side by side usually in a series of two to six, on the sides and eaves of buildings. The adults are mostly black with a yellow waist and legs. Many solitary wasps fall into the group of ' \_\_\_\_\_ ' and what distinguishes them is that they build nesting sites out of mud. There is the black and yellow dauber, blue, potter's wasp, organ pipe and many more. Usually their name depicts the shape of the nest they build but sometimes it simply refers to their colors or marking.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasp(s)
- E. Mud dauber(s)
- F. None of the Above

### Umbrella Wasps (*Polistes spp.* and *Mischocyttarus flavitarsis*)

6. Unlike many other wasps and yellowjackets, Umbrella wasps do not have a worker caste. All female wasps are capable of becoming the queen. Umbrella wasp nests do not have a paper envelope around them and are only a single comb. \_\_\_\_\_ usually hang their nests in eaves, attics, and sheds. Knocking down the nest is a waste of time because the wasps will rebuild it. Therefore, the wasps themselves must be destroyed.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasps
- E. Mud dauber(s)
- F. None of the Above

### Treating Nests beneath Grass, Mulch

7. Treating nests in covered or over-grown areas is best done by first broadcasting an insecticide over the area. This is especially important when the entrance hole is not visible due to loose materials. The area should be fairly well drenched both on and around the suspected entrance to the nest. Products containing \_\_\_\_\_ work well for this job.

- A. DE
- B. Chemicals alone
- C. Cypermethrin
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

### **Apply Pesticide when Bees are not Flying**

8. Besides wasps any of these products can be used for general purpose pest control in and around the home. Liquid concentrates are more cost effective for this particular job. If you are positive that you are dealing with only one nest, a 4 ounce bottle of \_\_\_\_\_ concentrate may be all that you will need, especially if you have no other pest control needs.

- A. DE
- B. Cypermethrin
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

### **Choosing Pest Products**

9. There are two different dusts that will work: Drione Dust and \_\_\_\_\_. The advantage of Drione Dust is that it has a very fast knock-down or kill of targeted pests.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

### **Application of Pest Products**

10. If large amounts of \_\_\_\_\_ are merely "dumped" into the nest entrance, the majority of the dust will merely pile up in one place. Properly applied dust will "float" through the chambers and most of the particles will tend to stick to top, bottom and sides of the tunnel as well as the nest itself.

- A. Deltamethrin (Delta Dust or Drione Dust)
- B. Chemicals alone
- C. Other insecticidal dusts
- D. Drione Dust
- E. Fenvalerate
- F. None of the Above



## African Honey Bee CEU Training Course Assignment #4 Last Names A-G

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

### Topic 1 Bee Introduction Final Examination Fill-In-the-blank

#### Virgin Queens

1. When mature, virgin queens take a mating flight and mate with 10-15 \_\_\_\_\_. In about three days the queen begins to lay eggs.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

2. Fertilized eggs develop into females (workers) and unfertilized eggs develop into \_\_\_\_\_. About 99 percent of the eggs laid by a queen are fertilized and develop into workers.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

#### The Waggle Dance

3. The other bees take in the information by keeping in close contact with the dancing bee and reconstructing its movements. They also receive information via their sense of smell about what is to be found at the food source (type of food, pollen, propolis, water) as well as its specific characteristics. \_\_\_\_\_ so well that the bees can find a food source with the help of the waggle dance even if there are hindrances they must detour around like an intervening mountain.

- A. The orientation function(s)
- B. Defensive behavior
- C. The movement is
- D. The foraging
- E. The absconding
- F. None of the Above

#### Absconding

4. Absconding is usually the result of a severe disturbance, such as predator activity, flooding, starvation, or other major stress. Absconding bees may travel 30-50 miles before finding a suitable nest site. Long flights may have to be \_\_\_\_\_.

- A. Barbed so that when it stings
- B. Have to be forced to sting
- C. The cause of stinging incidents
- D. A defensive behavior
- E. Interrupted several times to forage for food
- F. None of the Above

#### Food Gathering

5. Worker bees forage for \_\_\_\_\_, pollen, propolis, and water. They bring these raw materials back to the colony for use or storage.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

6. Propolis is a mixture of tree resins and \_\_\_\_\_. It is used to secure and seal cracks and crevices within the colony. Water is collected by foragers and has three important functions in the colony: to dilute thick honey, to maintain the desired humidity in the hive, and to maintain the proper temperature.
- A. Honey
  - B. Propolis
  - C. Pollen
  - D. Water
  - E. Nectar
  - F. None of the Above

### Defensive Behavior

7. \_\_\_\_\_ that have a tendency to increase the defensive behavior of bees include sudden and rapid movements, jarring or bumping hives or frames, vibrations and noise such as operating lawn mowers or tractors, odors (both good and bad), and dark colors. Bees are also more defensive in cooler, cloudy weather.
- A. Waggle dance
  - B. Defensive behavior
  - C. Stimuli
  - D. Foraging
  - E. Absconding
  - F. None of the Above

### The Africanization of the Honey Bee

8. The Africanized honey bee is simply \_\_\_\_\_, a result of breeding the European honey bee, *Apis mellifera mellifera*, with the African honey bee, *Apis mellifera scutellata*. The genetic differences in the hybrid Africanized bee make its habits different from those of the domestic European honey bee cultured in the United States.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. Worker bees
  - D. A hybrid honey bee
  - E. European honey bee, *Apis mellifera mellifera*, or EHB
  - F. None of the Above

### Honey Bee Breeding

9. For more than 300 years honey bees have been bred in the Americas. Honey bee breeding programs have used genetic material from all over the world, including Africa, but have concentrated mostly on \_\_\_\_\_. Desired characteristics include winter hardiness, tendency not to swarm, gentleness, low drone production, and other valuable traits.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. Worker bees
  - D. African honey bee, *Apis mellifera scutellata*, or AHB
  - E. European strains
  - F. None of the Above
10. The African strain of the honey bee is a tropical bee and has been selected by nature more than by man. African bee strains tend to be more defensive, swarm more often, and don't conform as well to our \_\_\_\_\_ management practices.
- A. Temperate honey bees
  - B. Tropical honey bees
  - C. "American" bee
  - D. African honey bee, *Apis mellifera scutellata*, or AHB
  - E. European honey bee, *Apis mellifera mellifera*, or EHB
  - F. None of the Above

## Topic 2 Bees and Related Bee-Like Insects

### Fill-In-the-blank

#### How Bees Make Honey

1. Bees actually have two stomachs, their honey stomach which they use like a \_\_\_\_\_ backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.
- A. Honey
  - B. Propolis
  - C. Pollen
  - D. Water
  - E. Nectar
  - F. None of the Above



2. The honeybees return to the hive and pass the \_\_\_\_\_ onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

3. During this time, enzymes are breaking the complex sugars in the nectar into \_\_\_\_\_ so that it is both more digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

4. The bees make the nectar dry even faster by fanning it with their wings. Once the honey is gooey enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 120 and 200 pounds of \_\_\_\_\_.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

#### **Carbohydrate Element**

5. \_\_\_\_\_ form the energy (or carbohydrate) element of the bees' diet while pollen forms the proteinaceous part of their diet. Both pollen and nectar are essential to normal colony growth. Without nectar the colony has no energy with which to perform its normal tasks and without pollen young bees cannot be reared.

- A. Honey
- B. Propolis
- C. Pollen
- D. Nectar and honey
- E. Nectar
- F. None of the Above

#### **Prevention of Absconding**

6. Where bees abscond frequently it is an indication that food, probably nectar is limited within the environment. Feeding bees is common in temperate bees; perhaps where the bees have collected insufficient honey or perhaps where too much honey has been harvested from a colony. In these cases the feeding of \_\_\_\_\_ will enable bees to survive a long period of dearth.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. \_\_\_\_\_ is NOT suitable for feeding bees as they lack the enzymes to deal with the complex sugars that remain in the unrefined sugar and will die of dysentery.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

#### **Feeding Pollen**

8. Feeding pollen is also practiced in areas where pollen is limited. This is most likely to be in the monoculture agricultural landscapes that are associated with large-scale industrialized farming. There are many places in the world where there is plenty of forage, \_\_\_\_\_. The level of bee absconding and ease of colonization is probably an indicator of the richness and health of the environment (for the people who live there as well as the bees).

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

9. Feeding \_\_\_\_\_ is normally practiced at the start of the colony build up period. This is the time when protein demands will be highest as the bees are rearing large numbers of young brood. If the colony build up seems unusual and there are no signs of pollen in the colony then it is possible that supplementary pollen feeding may be helpful. If beekeepers believe either pollen or nectar shortage is affecting the bees, the first line of investigation should be the availability of enough suitable tree species and the implementation of a planting program if possible.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

### **New Colonies**

10. Hives should have a volume, according to \_\_\_\_\_ flow, between 80 and 150 liters. Traditional hives should have an opening at the back side, for inspection and harvesting, far from the brood, which is positioned near the bee entrance.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

## **Topic 3 Bee Control Section**

### **Fill-In-the-blank**

#### **Bee Swarms**

1. A swarm of honey bees is a temporary inconvenience that may last a few hours or days. Honey bees in a swarm are usually gentle because they have stomachs full of \_\_\_\_\_. If left undisturbed, a swarm will locate new quarters and often disappear as quickly as it appeared. In the past, local beekeepers collected swarms to put into their unused hives. They would at times charge a nominal fee for their time and effort.

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

#### **Bees in Buildings**

2. Simply killing the bees will only make for more complex problems in the future. For instance, an unattended nest of \_\_\_\_\_ will attract other insects and animals. Wax moths will enter to consume the wax, cockroaches and ants will find the brood and honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

3. Decaying brood and fermenting honey will cause undesirable odors. \_\_\_\_\_ can soak into walls, making them impossible to paint or wallpaper. Walls will also remain moist to the touch for a considerable period of time. If removing the bees and their nest is not practical, then other methods of dealing with them can be considered.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

#### **Avoiding Bee Problems**

4. Most serious incidents involving bees can be avoided with a little effort. In areas where the \_\_\_\_\_ has become established, people should learn the basics about bees and their habits. When activities increase the possibility of interaction with bees, care should be taken to reduce incidents.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

### General Bee Control and Treatments

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- A. Create Colony Collapse Disorder
- B. Reluctant to fly
- C. Will swarm
- D. Nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

6. \_\_\_\_\_ is a natural bee insecticide. This effective bee killer is a dust that sticks to the legs and bodies of bees. Once on their legs and bodies, bees unwittingly carry it into their hives or nests and poison the rest of the colony.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. Sprinkle \_\_\_\_\_ on the ground around ground nesting sites, at the entrances of hives and nests, or, when dealing with honeybees in the walls, directly into hives via holes drilled through the wall and into the side of the hive.

- A. DE
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- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
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8. \_\_\_\_\_ are not generally used to destroy entire bee colonies. Instead, as they only kill the bees that get sprayed directly, pyrethrins are usually just used to keep populations from getting too out of hand. Microcare Aerosol is a good brand.

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- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

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9. Certain pesticides are harmful to bees. That's why we require instructions for protecting bees on the labels of pesticides that are known to be particularly harmful to bees. This is one of many reasons why everyone must read and follow pesticide label instructions. When most or all of the bees in a hive are killed by overexposure to a pesticide, we call that a bee kill incident resulting from acute pesticide poisoning. \_\_\_\_\_ from Colony Collapse Disorder and is almost always avoidable.

- A. But acute pesticide poisoning of a hive is very different
- B. Ground nesting sites
- C. Swarming
- D. But nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

10. Pesticides can affect honey bees in different ways. Some kill bees on contact in the field; others may cause brood damage or contaminate pollen, thus killing house bees. Before dying, poisoned bees can become irritable (likely to sting), paralyzed or stupefied, appear to be 'chilled' or exhibit other abnormal behavior. \_\_\_\_\_ are likely to be superseded when a colony is being poisoned.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

## Topic 4 Wasp Section

### Fill-In-the-blank

#### Eastern Yellowjacket (*Vespula maculifrons*)

1. Most yellowjackets have very slightly barbed stingers but the sting will not set in the victim's tissue like the barbed stinger of the honey bee. The stinger of \_\_\_\_\_, however, often sticks and when the insect is slapped off, the stinger may remain.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

2. Aerial-nesting yellowjackets, \_\_\_\_\_, build paper nests that they attach to the eaves of a building or that hang from the limb of a tree. The entrance normally is a hole at the bottom of the nest. These aerial nesters don't become scavengers at the end of the season, but they are extremely defensive when their nests are disturbed. Defending *D. arenaria* sometimes bite and/or sting, simultaneously.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

3. Wasp stingers have no barbs and can be used repeatedly, especially when the wasp gets inside clothing. As with any \_\_\_\_\_, it is best to leave the area of the nest site as quickly as possible if wasps start stinging.

- A. Food gathering habits
- B. Attack
- C. Threat
- D. Minor pollinators
- E. Stinging incident
- F. None of the Above

#### Aerial Nesters

4. The \_\_\_\_\_ is larger than the other yellowjackets and is black and white -- not black and yellow. It lives along the west coast, across Canada, and in all of the states in the eastern half of the country.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

#### Other Wasps

##### Blue Mud Wasp (*Chalybion californicum*)

5. This wasp is a "poor relative" of the Mud Dauber. The females use vacant mud wasp nests. They hunt on the ground, preying mainly on \_\_\_\_\_. Adults are metallic blue, blue green or bluish black.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

#### Apply Pesticide when Bees are not Flying

6. Besides wasps any of these products can be used for general purpose pest control in and around the home. Liquid concentrates are more cost effective for this particular job. If you are positive that you are dealing with only one nest, a 4 ounce bottle of \_\_\_\_\_ concentrate may be all that you will need, especially if you have no other pest control needs.

- A. DE
- B. Cypermethrin
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

7. There are three different sizes of liquid concentrate Cypermethrin: 4 ounce, 16 ounce, and 32 ounce. If you do not intend on doing your own general household pest control, you will usually not need the larger containers. Only when there is a great deal of landscape area to deal with will you need larger volumes of liquid insecticides. In this case, \_\_\_\_\_ is your best bet. For smaller jobs, buy one or two 4 ounce bottles of Cypermethrin. Always follow the label instructions.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

#### Choosing Pest Products

8. There are two different dusts that will work: Drione Dust and \_\_\_\_\_. The advantage of Drione Dust is that it has a very fast knock-down or kill of targeted pests.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

9. Delta Dust has the advantage of being water-proof, an asset that is very attractive when treating soil that might contain any type of moisture. \_\_\_\_\_ is the more popular of the two insecticides.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above

#### Application of Pest Products

10. If large amounts of \_\_\_\_\_ are merely "dumped" into the nest entrance, the majority of the dust will merely pile up in one place. Properly applied dust will "float" through the chambers and most of the particles will tend to stick to top, bottom and sides of the tunnel as well as the nest itself.

- A. Deltamethrin (Delta Dust or Drione Dust)
- B. Chemicals alone
- C. Other insecticidal dusts
- D. Drione Dust
- E. Fenvalerate
- F. None of the Above



## African Honey Bee CEU Training Course Assignment #5 Supplemental Exam for return students

You will have 90 days from the start of this course to have successfully passed this assignment with a score of 70 %. You may e mail the answers to TLC, info@tlch2o.com or fax the answers to TLC, (928) 272-0747. This assignment is available to you in a Word Format on TLC's Website. You can find online assistance for this course on the in the Search function on Adobe Acrobat PDF to help find the answers. Once you have paid the course fee, you will be provided complete course support from Student Services (928) 468-0665.

### Topic 1 Bee Introduction Final Examination Fill-In-the-blank

1. The African strain of the honey bee is a tropical bee and has been selected by nature more than by man. African bee strains tend to be more defensive, swarm more often, and don't conform as well to our \_\_\_\_\_ management practices.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

2. At first their body is soft, but the \_\_\_\_\_ hardens in about 12-24 hours. During the next few days, glands and reproductive organs (in the queens and drones) develop and mature.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

3. Abscinding is usually the result of a severe disturbance, such as predator activity, flooding, starvation, or other major stress. Abscinding bees may travel 30-50 miles before finding a suitable nest site. Long flights may have to be \_\_\_\_\_.

- A. Barbed so that when it stings
- B. Have to be forced to sting
- C. The cause of stinging incidents
- D. A defensive behavior
- E. Interrupted several times to forage for food
- F. None of the Above

4. Worker bees forage for \_\_\_\_\_, pollen, propolis, and water. They bring these raw materials back to the colony for use or storage.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

5. The honey bee undergoes complete metamorphosis, passing through four stages: egg, larva, pupa, and adult. Bees develop into three different castes: \_\_\_\_\_, queens, and drones.

- A. Solitary queen(s)
- B. Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

6. For more than 300 years honey bees have been bred in the Americas. Honey bee breeding programs have used genetic material from all over the world, including Africa, but have concentrated mostly on \_\_\_\_\_. Desired characteristics include winter hardiness, tendency not to swarm, gentleness, low drone production, and other valuable traits.

- A. Temperate honey bees
- B. Tropical honey bees
- C. Worker bees
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European strains
- F. None of the Above

7. \_\_\_\_\_ is converted from sucrose, a complex sugar, into fructose and glucose, simple sugars, by enzyme activity in the bee's "honey stomach." Then it is dehydrated from 60 to 65 percent water to the 17 to 20 percent water found in ripe honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

8. Propolis is a mixture of tree resins and \_\_\_\_\_. It is used to secure and seal cracks and crevices within the colony. Water is collected by foragers and has three important functions in the colony: to dilute thick honey, to maintain the desired humidity in the hive, and to maintain the proper temperature.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

9. \_\_\_\_\_ that have a tendency to increase the defensive behavior of bees include sudden and rapid movements, jarring or bumping hives or frames, vibrations and noise such as operating lawn mowers or tractors, odors (both good and bad), and dark colors. Bees are also more defensive in cooler, cloudy weather.

- A. Waggle dance
- B. Defensive behavior
- C. Stimuli
- D. Foraging
- E. Absconding
- F. None of the Above

10. The Africanized honey bee is simply \_\_\_\_\_, a result of breeding the European honey bee, *Apis mellifera mellifera*, with the African honey bee, *Apis mellifera scutellata*. The genetic differences in the hybrid Africanized bee make its habits different from those of the domestic European honey bee cultured in the United States.

- A. Temperate honey bees
- B. Tropical honey bees
- C. Worker bees
- D. A hybrid honey bee
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

## Topic 2 Bees and Related Bee-Like Insects

### Fill-In-the-blank

1. Where bees abscond frequently it is an indication that food, probably nectar is limited within the environment. Feeding bees is common in temperate bees; perhaps where the bees have collected insufficient honey or perhaps where too much honey has been harvested from a colony. In these cases the feeding of \_\_\_\_\_ will enable to bees to survive a long period of dearth.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

2. Feeding pollen is also practiced in areas where pollen is limited. This is most likely to be in the monoculture agricultural landscapes that are associated with large-scale industrialized farming. There are many places in the world where there is plenty of forage, \_\_\_\_\_. The level of bee absconding and ease of colonization is probably an indicator of the richness and health of the environment (for the people who live there as well as the bees).

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above



3. Feeding \_\_\_\_\_ is normally practiced at the start of the colony build up period. This is the time when protein demands will be highest as the bees are rearing large numbers of young brood. If the colony build up seems unusual and there are no signs of pollen in the colony then it is possible that supplementary pollen feeding may be helpful. If beekeepers believe either pollen or nectar shortage is affecting the bees, the first line of investigation should be the availability of enough suitable tree species and the implementation of a planting program if possible.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

4. \_\_\_\_\_ is NOT suitable for feeding bees as they lack the enzymes to deal with the complex sugars that remain in the unrefined sugar and will die of dysentery.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

5. Bees actually have two stomachs, their honey stomach which they use like a \_\_\_\_\_ backpack and their regular stomach. The honey stomach holds almost 70 mg of nectar and when full, it weighs almost as much as the bee does. Honeybees must visit between 100 and 1500 flowers in order to fill their honey stomachs.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

6. The honeybees return to the hive and pass the \_\_\_\_\_ onto other worker bees. These bees suck the nectar from the honeybee's stomach through their mouths. These "house bees" "chew" the nectar for about half an hour.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

7. During this time, enzymes are breaking the complex sugars in the nectar into \_\_\_\_\_ so that it is both more digestible for the bees and less likely to be attacked by bacteria while it is stored within the hive. The bees then spread the nectar throughout the honeycombs where water evaporates from it, making it a thicker syrup.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

8. The bees make the nectar dry even faster by fanning it with their wings. Once the honey is gooey enough, the bees seal off the cell of the honeycomb with a plug of wax. The honey is stored until it is eaten. In one year, a colony of bees eats between 120 and 200 pounds of \_\_\_\_\_.

- A. Honey
- B. Propolis
- C. Pollen
- D. Water
- E. Nectar
- F. None of the Above

9. \_\_\_\_\_ form the energy (or carbohydrate) element of the bees' diet while pollen forms the proteinaceous part of their diet. Both pollen and nectar are essential to normal colony growth. Without nectar the colony has no energy with which to perform its normal tasks and without pollen young bees cannot be reared.

- A. Honey
- B. Propolis
- C. Pollen
- D. Nectar and honey
- E. Nectar
- F. None of the Above

10. Hives should have a volume, according to \_\_\_\_\_ flow, between 80 and 150 liters. Traditional hives should have an opening at the back side, for inspection and harvesting, far from the brood, which is positioned near the bee entrance.

- A. Honey
- B. Propolis
- C. Pollen
- D. Vegetational nectar
- E. Nectar
- F. None of the Above

### Topic 3 Bee Control Section

#### Fill-In-the-blank

1. In some cases, attempting to destroy a nest becomes a greater health risk than simply tolerating and avoiding it. But nests, especially those of social species, should be destroyed if they are close enough to humans to pose a stinging threat. The nests of honey bees, bumble bees, yellowjackets and hornets should always be approached with caution, preferably at night when most of the workers are present but \_\_\_\_\_.

- A. Create Colony Collapse Disorder
- B. Reluctant to fly
- C. Will swarm
- D. Nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

2. \_\_\_\_\_ is a natural bee insecticide. This effective bee killer is a dust that sticks to the legs and bodies of bees. Once on their legs and bodies, bees unwittingly carry it into their hives or nests and poison the rest of the colony.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

3. Pesticides can affect honey bees in different ways. Some kill bees on contact in the field; others may cause brood damage or contaminate pollen, thus killing house bees. Before dying, poisoned bees can become irritable (likely to sting), paralyzed or stupefied, appear to be 'chilled' or exhibit other abnormal behavior. \_\_\_\_\_ are likely to be superseded when a colony is being poisoned.

- A. Solitary queen(s)
- B. Females or Workers
- C. Queen(s)
- D. Bee colonies
- E. Drones or Males
- F. None of the Above

4. Sprinkle \_\_\_\_\_ on the ground around ground nesting sites, at the entrances of hives and nests, or, when dealing with honeybees in the walls, directly into hives via holes drilled through the wall and into the side of the hive.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

5. A swarm of honey bees is a temporary inconvenience that may last a few hours or days. Honey bees in a swarm are usually gentle because they have stomachs full of \_\_\_\_\_. If left undisturbed, a swarm will locate new quarters and often disappear as quickly as it appeared. In the past, local beekeepers collected swarms to put into their unused hives. They would at times charge a nominal fee for their time and effort.

- A. Honey
- B. Propolis
- C. Pollen
- D. Both nectar and pollen
- E. Nectar
- F. None of the Above

6. Simply killing the bees will only make for more complex problems in the future. For instance, an unattended nest of \_\_\_\_\_ will attract other insects and animals. Wax moths will enter to consume the wax, cockroaches and ants will find the brood and honey.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

7. Decaying brood and fermenting honey will cause undesirable odors. \_\_\_\_\_ can soak into walls, making them impossible to paint or wallpaper. Walls will also remain moist to the touch for a considerable period of time. If removing the bees and their nest is not practical, then other methods of dealing with them can be considered.

- A. Honey
- B. Propolis
- C. Pollen
- D. Melting wax and honey
- E. Beeswax, honey, brood, and pollen
- F. None of the Above

8. Most serious incidents involving bees can be avoided with a little effort. In areas where the \_\_\_\_\_ has become established, people should learn the basics about bees and their habits. When activities increase the possibility of interaction with bees, care should be taken to reduce incidents.

- A. Temperate honey bees
- B. Tropical honey bees
- C. "American" bee
- D. African honey bee, *Apis mellifera scutellata*, or AHB
- E. European honey bee, *Apis mellifera mellifera*, or EHB
- F. None of the Above

9. \_\_\_\_\_ are not generally used to destroy entire bee colonies. Instead, as they only kill the bees that get sprayed directly, pyrethrins are usually just used to keep populations from getting too out of hand. Microcare Aerosol is a good brand.

- A. DE
- B. Boric acid
- C. Pyrethrin(s)
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

10. Certain pesticides are harmful to bees. That's why we require instructions for protecting bees on the labels of pesticides that are known to be particularly harmful to bees. This is one of many reasons why everyone must read and follow pesticide label instructions. When most or all of the bees in a hive are killed by overexposure to a pesticide, we call that a bee kill incident resulting from acute pesticide poisoning. \_\_\_\_\_ from Colony Collapse Disorder and is almost always avoidable.

- A. But acute pesticide poisoning of a hive is very different
- B. Ground nesting sites
- C. Swarming
- D. But nests, especially those of social species
- E. New quarters and often disappear as quickly as it appeared
- F. None of the Above

## Topic 4 Wasp Section

### Fill-In-the-blank

1. Most yellowjackets have very slightly barbed stingers but the sting will not set in the victim's tissue like the barbed stinger of the honey bee. The stinger of \_\_\_\_\_, however, often sticks and when the insect is slapped off, the stinger may remain.

- A. Hornet(s)
- B. *D. arenaria* and *D. maculata*
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. *V. maculifrons*
- F. None of the Above

2. This is a common wasp. Females build a mud nest of cells laid side by side usually in a series of two to six, on the sides and eaves of buildings. The adults are mostly black with a yellow waist and legs. Many solitary wasps fall into the group of '\_\_\_\_\_,' and what distinguishes them is that they build nesting sites out of mud. There is the black and yellow dauber, blue, potter's wasp, organ pipe and many more. Usually their name depicts the shape of the nest they build but sometimes it simply refers to their colors or marking.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Umbrella wasp(s)
- E. Mud dauber(s)
- F. None of the Above

3. The social wasps can be fractured into 2 groups, the Yellowjackets / Hornets and Paper wasps. Most of these wasps feed on insect pests eliminating large numbers of them. \_\_\_\_\_ feed abundantly on armyworms, corn earworms and other ag pests.

- A. Hornet(s)
- B. Honey bee
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. The social wasp(s)
- F. None of the Above

4. Hornets will take house flies, blow flies and caterpillars. Other Yellowjacket species are exclusively scavengers. Unless they nest or are active near human activities, it's best to leave them alone. But unlike \_\_\_\_\_, these wasps can become very defensive when their nests are disturbed. Loud noises such as a lawnmower, vibration from even footsteps or just coming too close to a nest can elicit a defensive response.

- A. Hornet(s)
- B. Honey bee
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. The social wasp(s)
- F. None of the Above

5. Besides wasps any of these products can be used for general purpose pest control in and around the home. Liquid concentrates are more cost effective for this particular job. If you are positive that you are dealing with only one nest, a 4 ounce bottle of \_\_\_\_\_ concentrate may be all that you will need, especially if you have no other pest control needs.

- A. DE
- B. Cypermethrin
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Fenvalerate
- F. None of the Above

6. Aerial-nesting yellowjackets, \_\_\_\_\_, build paper nests that they attach to the eaves of a building or that hang from the limb of a tree. The entrance normally is a hole at the bottom of the nest. These aerial nesters don't become scavengers at the end of the season, but they are extremely defensive when their nests are disturbed. Defending D. arenaria sometimes bite and/or sting, simultaneously.

- A. Hornet(s)
- B. D. arenaria and D. maculata
- C. Paper wasp(s)
- D. Both yellowjacket and paper wasps
- E. V. maculifrons
- F. None of the Above

7. Wasp stingers have no barbs and can be used repeatedly, especially when the wasp gets inside clothing. As with any \_\_\_\_\_, it is best to leave the area of the nest site as quickly as possible if wasps start stinging.

- A. Food gathering habits
- B. Attack
- C. Threat
- D. Minor pollinators
- E. Stinging incident
- F. None of the Above

8. The \_\_\_\_\_ is larger than the other yellowjackets and is black and white -- not black and yellow. It lives along the west coast, across Canada, and in all of the states in the eastern half of the country.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

9. This wasp is a "poor relative" of the Mud Dauber. The females use vacant mud wasp nests. They hunt on the ground, preying mainly on \_\_\_\_\_. Adults are metallic blue, blue green or bluish black.

- A. Hornet(s)
- B. Bald Faced hornet(s)
- C. Paper wasp(s)
- D. Black Widow spider(s)
- E. Mud dauber(s)
- F. None of the Above

10. There are three different sizes of liquid concentrate Cypermethrin: 4 ounce, 16 ounce, and 32 ounce. If you do not intend on doing your own general household pest control, you will usually not need the larger containers. Only when there is a great deal of landscape area to deal with will you need larger volumes of liquid insecticides. In this case, \_\_\_\_\_ is your best bet. For smaller jobs, buy one or two 4 ounce bottles of Cypermethrin. Always follow the label instructions.

- A. Cypermethrin
- B. Delta Dust
- C. Other insecticidal dusts
- D. Drione Dust (pyrethrins, pipernyl butoxide, and silica gel)
- E. Demon Max (Demon EC)
- F. None of the Above