

Registration form

Mosquito Control CEU Training Course Assignment \$150.00

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

Name _____ **Signature** _____
(This will appear on your certificate as above)

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Phone:
Home () _____ **Work** () _____ **Fax** () _____

License or Operator ID # _____ **Exp Date** _____

Class/Grade _____

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

Commercial Applicator Residential Applicator Industrial Applicator

Pesticide Handler Agricultural Applicator Advisor Aerial Applicator

Other _____

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

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Mosquito Control Answer Key

Name

Phone Number

Address

Please circle the best answer

- | | | | |
|---------------|---------------|----------|----------------|
| 1. A B C D E | 46. A B C D E | 91. A B | 136. A B |
| 2. A B C D E | 47. A B C D E | 92. A B | 137. A B |
| 3. A B C D E | 48. A B C D E | 93. A B | 138. A B |
| 4. A B C D E | 49. A B C D E | 94. A B | 139. A B |
| 5. A B C D E | 50. A B C D E | 95. A B | 140. A B |
| 6. A B C D E | 51. A B C D E | 96. A B | 141. A B |
| 7. A B C D E | 52. A B C D E | 97. A B | 142. A B |
| 8. A B C D E | 53. A B C D E | 98. A B | 143. A B |
| 9. A B C D E | 54. A B C D E | 99. A B | 144. A B |
| 10. A B C D E | 55. A B C D E | 100. A B | 145. A B |
| 11. A B C D E | 56. A B C D E | 101. A B | 146. A B |
| 12. A B C D E | 57. A B C D E | 102. A B | 147. A B |
| 13. A B C D E | 58. A B C D E | 103. A B | 148. A B |
| 14. A B C D E | 59. A B C D E | 104. A B | 149. A B |
| 15. A B C D E | 60. A B C D E | 105. A B | 150. A B |
| 16. A B C D E | 61. A B C D E | 106. A B | 151. A B |
| 17. A B C D E | 62. A B C D E | 107. A B | 152. A B |
| 18. A B C D E | 63. A B C D E | 108. A B | 153. A B |
| 19. A B C D E | 64. A B C D E | 109. A B | 154. A B |
| 20. A B C D E | 65. A B C D E | 110. A B | 155. A B |
| 21. A B C D E | 66. A B | 111. A B | 156. A B |
| 22. A B C D E | 67. A B | 112. A B | 157. A B |
| 23. A B C D E | 68. A B | 113. A B | 158. A B |
| 24. A B C D E | 69. A B | 114. A B | 159. A B |
| 25. A B C D E | 70. A B | 115. A B | 160. A B |
| 26. A B C D E | 71. A B | 116. A B | 161. A B |
| 27. A B C D E | 72. A B | 117. A B | 162. A B |
| 28. A B C D E | 73. A B | 118. A B | 163. A B |
| 29. A B C D E | 74. A B | 119. A B | 164. A B |
| 30. A B C D E | 75. A B | 120. A B | 165. A B |
| 31. A B C D E | 76. A B | 121. A B | 166. A B |
| 32. A B C D E | 77. A B | 122. A B | 167. A B |
| 33. A B C D E | 78. A B | 123. A B | 168. A B |
| 34. A B C D E | 79. A B | 124. A B | 169. A B |
| 35. A B C D E | 80. A B | 125. A B | 170. A B |
| 36. A B C D E | 81. A B | 126. A B | 171. A B |
| 37. A B C D E | 82. A B | 127. A B | 172. A B |
| 38. A B C D E | 83. A B | 128. A B | 173. A B |
| 39. A B C D E | 84. A B | 129. A B | 174. A B |
| 40. A B C D E | 85. A B | 130. A B | 175. A B |
| 41. A B C D E | 86. A B | 131. A B | 176. A B C D E |
| 42. A B C D E | 87. A B | 132. A B | 177. A B C D E |
| 43. A B C D E | 88. A B | 133. A B | 178. A B C D E |
| 44. A B C D E | 89. A B | 134. A B | 179. A B C D E |
| 45. A B C D E | 90. A B | 135. A B | 180. A B C D E |

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|------|-----------|------|-----------|------|-----------|------|-----------|
| 181. | A B C D E | 196. | A B C D E | 211. | A B C D E | 226. | A B C D E |
| 182. | A B C D E | 197. | A B C D E | 212. | A B C D E | 227. | A B C D E |
| 183. | A B C D E | 198. | A B C D E | 213. | A B C D E | 228. | A B C D E |
| 184. | A B C D E | 199. | A B C D E | 214. | A B C D E | 229. | A B C D E |
| 185. | A B C D E | 200. | A B C D E | 215. | A B C D E | 230. | A B C D E |
| 186. | A B C D E | 201. | A B C D E | 216. | A B C D E | 231. | A B C D E |
| 187. | A B C D E | 202. | A B C D E | 217. | A B C D E | 232. | A B C D E |
| 188. | A B C D E | 203. | A B C D E | 218. | A B C D E | 233. | A B C D E |
| 189. | A B C D E | 204. | A B C D E | 219. | A B C D E | 234. | A B C D E |
| 190. | A B C D E | 205. | A B C D E | 220. | A B C D E | 235. | A B C D E |
| 191. | A B C D E | 206. | A B C D E | 221. | A B C D E | 236. | A B C D E |
| 192. | A B C D E | 207. | A B C D E | 222. | A B C D E | 237. | A B C D E |
| 193. | A B C D E | 208. | A B C D E | 223. | A B C D E | 238. | A B C D E |
| 194. | A B C D E | 209. | A B C D E | 224. | A B C D E | 239. | A B C D E |
| 195. | A B C D E | 210. | A B C D E | 225. | A B C D E | 240. | A B C D E |

Please mail this with your final exam

MOSQUITO CONTROL CEU COURSE
PROFESSIONAL DEVELOPMENT COURSE
CUSTOMER SERVICE RESPONSE CARD

DATE: _____

NAME: _____

ADDRESS: _____

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?

Any other concerns or comments.

Mosquito Control CEU Training Course Assignment

You will have 90 days from the start of this course to have successfully completed this assignment with a score of 70% or better. You may e-mail the answers to TLC, info@tlch2o.com or fax the answers to TLC (928) 272-0747.

Mosquito Identification Section

1. Eastern Treehole Mosquito

- A. *Aedes tivittatus*
- B. *Aedes triseriatus*
- C. *Aedes canadensis*
- D. *Aedes albopictus*
- E. None of the Above

2. Asian Tiger Mosquito

- A. *Aedes tivittatus*
- B. *Aedes triseriatus*
- C. *Aedes canadensis*
- D. *Aedes albopictus*
- E. None of the Above

3. Banded Spring Mosquito

- A. *Aedes tivittatus*
- B. *Aedes triseriatus*
- C. *Aedes canadensis*
- D. *Aedes albopictus*
- E. None of the Above

4. Flood-water Mosquito

- A. *Aedes tivittatus*
- B. *Aedes triseriatus*
- C. *Aedes canadensis*
- D. *Aedes albopictus*
- E. None of the Above

5. Vexans Mosquito

- A. *Anopheles quadrimaculatus*
- B. *Culex pipiens*
- C. *Coquillettidia perturbans*
- D. *Aedes vexans*
- E. None of the Above

If you need any assistance, utilize the Search function in Adobe Acrobat.

6. Northern House Mosquito
A. Anopheles quadrimaculatus
B. Culex pipiens
C. Coquillettidia perturbans
D. Aedes vexans
E. None of the Above

7. Cattail Mosquito
A. Anopheles quadrimaculatus
B. Culex pipiens
C. Coquillettidia perturbans
D. Aedes vexans
E. None of the Above

8. Common Malaria Mosquito
A. Anopheles quadrimaculatus
B. Culex pipiens
C. Coquillettidia perturbans
D. Aedes vexans
E. None of the Above

Identify the Definition or Term

9. Inflammation of the brain, which can be caused by numerous viruses, including West Nile Virus endemic the normal presence of a disease or infectious agent among human beings within a geographic area.

- A. Enzootic
B. Encephalitis
C. Endemic
D. Epizootic
E. Etiologic

10. A disease naturally present in certain human or animal populations.

- A. Enzootic
B. Encephalitis
C. Endemic
D. Epizootic
E. Etiologic

11. A disease naturally present in certain animal populations (sometimes used in contrast with "endemic").

- A. Enzootic
B. Encephalitis
C. Endemic
D. Epizootic

12. A disease outbreak affecting certain human or animal populations.

- A. Enzootic
B. Encephalitis
C. Endemic
D. Epizootic
E. None of the Above

13. A disease outbreak affecting certain animal populations (sometimes used in contrast with "**epidemic**").

- A. Enzootic
- B. Encephalitis
- C. Endemic
- D. Epizootic
- E. Etiologic

14. Agents biologic organism or chemical material that cause disease.

- A. Enzootic
- B. Encephalitis
- C. Endemic
- D. Epizootic
- E. Etiologic

15. A subset of arboviruses (transmitted by arthropods); this family of viruses includes West Nile Virus, St. Louis Encephalitis and several others.

- A. Flavivirus
- B. Gravid Traps
- C. Host
- D. Intermediate Host
- E. IPM

16. Type of mosquito traps designed to attract pregnant female mosquitoes.

- A. Flavivirus
- B. Gravid Traps
- C. Host
- D. Intermediate Host
- E. IPM

17. A living organism that serves as a blood source for blood-feeding arthropods, or on which a parasite lives.

- A. Flavivirus
- B. Gravid Traps
- C. Host
- D. Intermediate Host

18. The arthropod carrier of a parasitic organism.

- A. Flavivirus
- B. Gravid Traps
- C. Host
- D. Intermediate Host
- E. IPM

19. A system for minimizing the impact of vectors and pests by using a variety of control procedures, and decreasing the chemical input to the environment.

- A. Flavivirus
- B. Gravid Traps
- C. Host
- D. Intermediate Host
- E. IPM

20. Immature mosquitoes; stage which hatches from the egg, prior to adult stage.
- A. Larvae
 - B. Autochthonous
 - C. Adulticide
 - D. Larvicide
 - E. None of the Above
21. A type of pesticide used to eradicate immature mosquitoes (larvae).
- A. Larvae
 - B. Autochthonous
 - C. Adulticide
 - D. Larvicide
 - E. None of the Above
22. A type of pesticide used to kill adult mosquitoes.
- A. Larvae
 - B. Autochthonous
 - C. Adulticide
 - D. Larvicide
 - E. None of the Above
23. Native to a place; not imported; used to describe a disease transmitted by vectors that became infected from a local source.
- A. Larvae
 - B. Autochthonous
 - C. Adulticide
 - D. Larvicide
 - E. None of the Above
24. A type of larvicide; chemical that is used to prevent mosquito larvae from emerging and developing into adult mosquitoes.
- A. Methoprene
 - B. Altosid
 - C. Microbial insecticide
 - D. Bacillus Sphaericus
25. An insecticide made of bacteria whose infection kills insects; a substance produced by bacteria that is lethal to insects.
- A. Methoprene
 - B. Altosid
 - C. Microbial insecticide
 - D. Bacillus Sphaericus
 - E. Convalescent Blood Sera
26. A location where mosquitoes lay eggs, usually in stagnant water with organic material.
- A. Larvae
 - B. Autochthonous
 - C. Adulticide
 - D. Larvicide
 - E. None of the Above

27. Brand name of methoprene, a type of larvicide.
- A. Methoprene
 - B. Altosid
 - C. Microbial insecticide
 - D. Bacillus Sphaericus
 - E. Convalescent Blood Sera
28. A bacterium; type of biological pesticide used to eradicate mosquito larvae in water. Mosquito larvae die after ingesting this bacteria.
- A. Methoprene
 - B. Altosid
 - C. Microbial insecticide
 - D. Bacillus Sphaericus
 - E. Convalescent Blood Sera
29. Blood serum collected from patients recently recovered from a disease, often used to test whether a person has had a specific infection.
- A. Methoprene
 - B. Altosid
 - C. Microbial insecticide
 - D. Bacillus Sphaericus
 - E. Convalescent Blood Sera
30. A virus whose life cycle includes transmission by arthropods.
- A. Aseptic Meningitis
 - B. Mosquito Pools
 - C. Arthropod
 - D. Arbovirus
 - E. None of the Above
31. An invertebrate animal with jointed legs and a segmented body (includes flies, mosquitoes, ticks; also centipedes, scorpions, spiders etc.).
- A. Aseptic Meningitis
 - B. Mosquito Pools
 - C. Arthropod
 - D. Arbovirus
 - E. None of the Above
32. Inflammation of the lining of the brain and spinal cord, not due to a bacterial infection.
- A. Aseptic Meningitis
 - B. Mosquito Pools
 - C. Arthropod
 - D. Arbovirus
 - E. None of the Above
33. A group of mosquitoes collected in one area and combined at the laboratory for testing for the presence of West Nile and related viruses.
- A. Aseptic Meningitis
 - B. Mosquito Pools
 - C. Arthropod
 - D. Arbovirus

34. This chemical name ***N,N-diethyl-meta-toluamide***, is the active ingredient in many insect repellent products.
- A. Malathion
 - B. Naled
 - C. Dursban
 - D. Sevin
 - E. DEET
35. Autopsy on an animal.
- A. Aseptic Meningitis
 - B. Necropsy
 - C. Neurology
 - D. Arbovirus
 - E. None of the Above
36. The study of the nervous system and its disorders.
- A. Aseptic Meningitis
 - B. Necropsy
 - C. Neurology
 - D. Arbovirus
 - E. None of the Above
37. The jointed feelers on each side of the mouth of some arthropods.
- A. Phlebotomy
 - B. Palpi
 - C. Overwintering
 - D. Outbreak
 - E. Pesticide
38. Substance used to kill pests such as insects, mice and rats; insecticide is a form of pesticide.
- A. Phlebotomy
 - B. Palpi
 - C. Overwintering
 - D. Outbreak
 - E. Pesticide
39. Blood Drawing.
- A. Phlebotomy
 - B. Palpi
 - C. Overwintering
 - D. Outbreak
 - E. Pesticide
40. An unexpected increase in frequency or distribution of a disease.
- A. Phlebotomy
 - B. Palpi
 - C. Overwintering
 - D. Outbreak
 - E. Pesticide

41. A period of rest or hibernation by which insects survive the winter.
- A. Phlebotomy
 - B. Palpi
 - C. Overwintering
 - D. Outbreak
 - E. Pesticide
42. The straw-like sucking mouthparts of some blood feeding arthropods.
- A. Proboscis
 - B. Resmethrin
 - C. Rickettsia
 - D. Vectobac
 - E. ULV
43. Brand name for larvicide *Bacillus thuringiensis* var. *israelensis* (**BTI**).
- A. Proboscis
 - B. Resmethrin
 - C. Rickettsia
 - D. Vectobac
 - E. ULV
44. Brand name for larvicide *Bacillus sphaericus*.
- A. Proboscis
 - B. Resmethrin
 - C. Vectolex
 - D. Vectobac
 - E. ULV
45. A synthetic pyrethroid pesticide used to eradicate adult mosquitoes in the home, lawn, garden and at industrial sites; active ingredient in the product **Scourge**.
- A. Proboscis
 - B. Resmethrin
 - C. Rickettsia
 - D. Vectobac
 - E. ULV
46. A group of small bacteria that live inside tissue cells, and are carried by ticks, mites, fleas or lice.
- A. Proboscis
 - B. Resmethrin
 - C. Rickettsia
 - D. Vectobac
 - E. ULV
47. A method of insecticide distribution in which a small portion of the compound is fragmented into extremely fine particles for aerial dispersal.
- A. Proboscis
 - B. Resmethrin
 - C. Rickettsia
 - D. Vectobac
 - E. ULV

48. An arthropod carrier of a disease producing organism. Usually used when part of the organism's natural life cycle takes place in the arthropod (= intermediate host).

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector control
- E. Vector Surveillance

49. Management of organisms that carry disease.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Control
- E. Vector Surveillance

50. Instituted to control and reduce the vector population.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Control
- E. Vector Surveillance

51. Monitoring of the vector population for presence of a disease.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector Control
- E. Vector Surveillance

52. A disease carried by arthropod intermediate hosts.

- A. Vector-borne disease
- B. Vector
- C. Vector Control Mechanism
- D. Vector control
- E. Vector Surveillance

53. Of, or relating to, a virus.

- A. Viral Encephalitis
- B. Zoonosis
- C. Viral
- D. Salt Marsh
- E. Sentinel 'Guard'

54. Inflammation of the brain caused by a virus.

- A. Viral Encephalitis
- B. Zoonosis
- C. Viral
- D. Salt Marsh
- E. Sentinel 'Guard'

55. A disease of animals that may be secondarily transmitted to man.
- A. Viral Encephalitis
 - B. Zoonosis
 - C. Viral
 - D. Salt Marsh
 - E. Sentinel 'Guard'
56. Areas of vegetation in bodies of salt water that may support the breeding of certain types of mosquitoes such as *Aedes sollicitans*.
- A. Viral Encephalitis
 - B. Zoonosis
 - C. Viral
 - D. Salt Marsh
 - E. Sentinel 'Guard'
57. The testing of birds and other animals as an early warning system for the presence of virus (e.g. sentinel chickens).
- A. Viral Encephalitis
 - B. Zoonosis
 - C. Viral
 - D. Salt Marsh
 - E. Sentinel 'Guard'
58. This means of, or relating to serum.
- A. Serologic
 - B. Zoonosis
 - C. Viral
 - D. Salt Marsh
 - E. Sentinel 'Guard'
59. Positive laboratory result of a serum sample.
- A. Serum
 - B. *Aedes Sollicitans*
 - C. *Culex Pipiens*
 - D. Sumithrin
 - E. None of the Above
60. Liquid portion of the blood containing proteins, including antibodies.
- A. Serum
 - B. *Aedes Sollicitans*
 - C. *Culex Pipiens*
 - D. Sumithrin
 - E. St. Louis Encephalitis (SLE)
61. Container used to hold a substance producing dense smoke; used to drive away insects.
- A. Serum
 - B. *Aedes Sollicitans*
 - C. *Culex Pipiens*
 - D. Sumithrin
 - E. None of the Above

62. Mosquito-borne viral disease that causes inflammation of the brain; very similar to West Nile Virus.

- A. Serum
- B. Aedes Sollicitans
- C. Culex Pipiens
- D. Sumithrin
- E. St. Louis Encephalitis (SLE)

63. A synthetic pyrethroid pesticide used to eradicate adult mosquitoes in swamps,

- A. Serum
- B. Aedes Sollicitans
- C. Culex Pipiens
- D. Sumithrin
- E. St. Louis Encephalitis (SLE)

64. Species of mosquito, the primary known vector for West Nile virus, commonly found in urban areas; breeds in fresh but stagnant water.

- A. Serum
- B. Aedes Sollicitans
- C. Culex Pipiens
- D. Sumithrin
- E. St. Louis Encephalitis (SLE)

65. Species of mosquito that is not known to transmit West Nile virus; breeds in salt marshes.

- A. Serum
- B. Aedes Sollicitans
- C. Culex Pipiens
- D. Sumithrin
- E. St. Louis Encephalitis (SLE)

True or False Section

66. About 3000 species of mosquitoes have been described on a world-wide basis.

- A. True
- B. False

67. Approximately 50-100 species of mosquitoes are known to occur in North America.

- A. True
- B. False

68. Mosquitoes belong to a group of insects that requires blood to develop fertile eggs. Females do not lay eggs, thus, female mosquitoes do not bite. The females are the egg producers and "**host-seek**" for a blood meal.

- A. True
- B. False

69. Female mosquitoes lay single batches of eggs and require a blood meal for every batch they lay. Few people realize that mosquitoes rely on blood as their main source of energy.

- A. True
- B. False

70. Both male and female mosquitoes feed on plant nectar, fruit juices and liquids that ooze from plants. The sugar is burned as fuel for flight and is replenished on a daily basis. Blood is reserved for egg production and is imbibed less frequently.

- A. True
- B. False

71. When a female mosquito pierces the skin with her mouthparts, she injects a small amount of her eggs into the wound before drawing blood.

- A. True
- B. False

72. The saliva makes penetration easier and prevents the blood from clotting in the narrow channel of her food canal. The welts that appear after the mosquito leaves is not a reaction to the wound but an allergic reaction to the saliva injected to prevent clotting.

- A. True
- B. False

73. In most cases, the itching sensation and swellings subside within several days. Some people are highly sensitive and symptoms persist for several weeks. Scratching the bites cannot result in infection.

- A. True
- B. False

74. Scientists are still investigating the complexities involved with mosquito host acceptance and rejection. Some people are highly attractive to mosquitoes and others are rarely bothered. Mosquitoes have specific requirements to satisfy and process many different factors before they feed.

- A. True
- B. False

75. Many of the mosquito's physiological demands are fully understood and many of the processes they use to evaluate potential blood meal hosts are simple to figure. Male mosquitoes use the CO₂ we exhale as their primary cue to our location. A host seeking mosquito is guided to our skin by following the slip stream of CO₂ that exudes from our breath.

- A. True
- B. False

76. Once they have landed, they rely on a number of long range attractants to determine if we are an acceptable blood meal host. Nitric acid is one chemical that appears to be particularly important. Fragrances from hair sprays, perfumes, deodorants and soap can cover these chemical cues. They can also function to either enhance or repel the host seeking drive.

- A. True
- B. False

77. Light colors capture heat and make most people more attractive to mosquitoes. Dark colors refract heat and are generally less attractive.

- A. True
- B. False

78. Detergents, fabric softeners, perfumes and body odor can counteract the effects of color. In most cases, only the mosquito knows why one person is more attractive than another.

- A. True
- B. False

79. Mosquitoes are relatively strong insects with an adult life span that lasts about 2 years. The vast majority meet a violent end by serving as food for birds, dragonflies and spiders or are killed by the effects of pesticides.

- A. True
- B. False

80. The mosquito species that only has multiple generations each year are longer lived and may persist in large numbers for as long as 2-3 months if environmental conditions are favorable.

- A. True
- B. False

81. Mosquitoes that hibernate in the adult stage live for 6-8 weeks but spend most of that time in a state of torpor. Some of the mosquito species found in arctic regions enter hibernation four times and take more than a year to complete their life cycle.

- A. True
- B. False

82. Mosquitoes, like most insects, are cold blooded creatures. As a result, they are incapable of regulating body heat and their temperature is essentially the same as their surroundings. Mosquitoes function best at 100° F, become lethargic at 90° F and cannot function below 80° F.

- A. True
- B. False

83. In tropical areas, mosquitoes are active year round. In temperate climates, adult mosquitoes become inactive with the onset of cool weather and enter hibernation to live through the winter. Some kinds of mosquitoes have winter hardy eggs and hibernate as embryos in eggs laid by the last generation of females in late summer.

- A. True
- B. False

84. The eggs are usually submerged under ice and hatch in spring when water temperatures rise.

- A. True
- B. False

85. Other kinds of mosquitoes overwinter as adult females that mate in the fall, enter hibernation in animal burrows, hollow logs or basements and pass the winter in a state of torpor. In spring, the females emerge from hibernation, blood feed and lay the eggs that produce the next generation of adults.

- A. True
- B. False

86. A limited number of mosquitoes overwinter in the larval stage, often buried in the mud of freshwater swamps. When temperatures rise in spring, these mosquitoes begin feeding, complete their immature growth and eventually emerge as adults to continue their kind.
A. True
B. False
87. Mosquitoes cannot transmit diseases such as dengue, yellow fever, and malaria to humans.
A. True
B. False
88. Mosquito-borne encephalitis is a viral inflammation of the heart.
A. True
B. False
89. Encephalitis can infect humans, horses, and a variety of other mammals and birds. Eastern equine encephalomyelitis (**EEE**), although very rare is not fatal. A small rural outbreak in late 1991 resulted in more than 20 farm animal injuries, most of which were horses.
A. True
B. False
90. Transmission of the disease occurs when an infected mosquito takes a blood meal. Birds serve as natural hosts for EEE and St. Louis encephalitis (**SLE**). St. Louis encephalitis, like EEE is an epidemic disease, meaning that it is usually rare. It can be absent from an area for several years and then reoccur suddenly without warning. LaCrosse encephalitis (**LAC**) is the third type found and is considered endemic to some states and occurs year after year at low levels.
A. True
B. False
91. Small woodland mammals, such as chipmunks and squirrels, serve as the natural host for the virus, however LAC virus can also be passed, transovarially, from mother mosquito to her offspring.
A. True
B. False
92. Not only can mosquitoes carry diseases which afflict humans, but they also can transmit several diseases and parasites that dogs and horses are very susceptible to. These include rabies and colic. Rabies is the most significant of these, however in some areas; veterinarians are beginning to see more heartworm in cats.
A. True
B. False
93. The mosquitoes in the United States, all of which live in specific habitats, exhibit unique behaviors and bite different types of animals. Despite these differences, all mosquitoes share some common traits, such as a five-stage life cycle.
A. True
B. False

94. After the female mosquito obtains a blood meal (**male mosquitoes do not bite**), she lays her eggs directly on the surface of stagnant water, in a depression, or on the edge of a container where rainwater may collect and flood the eggs. The eggs hatch and a mosquito pupa or "**tumbler**" emerges.

- A. True
- B. False

95. The larva lives in the water, feeds and develops into the third stage of the life cycle called a larva. The larva also lives in the water, but no longer feeds. Finally, the mosquito emerges from the larval case and the water as a fully developed adult, ready to bite.

- A. True
- B. False

96. Mosquitoes may overwinter as eggs, fertilized adult females or larvae. Eggs, larvae, and pupae must have water to develop. Some female mosquitoes lay their eggs directly on the water surface.

- A. True
- B. False

97. Others lay their eggs on substrates above the water line (flood pool mosquitoes); the eggs hatch upon flooding. In some cases, the eggs will remain viable for several years until further flooding occurs. Mosquitoes belonging to the genus *Culex* lay their eggs in bunches or "rafts."

- A. True
- B. False

98. Each raft may contain up to 40 individual eggs. Larvae feed on bits of inorganic matter dispersed in the water, becoming full grown in about three weeks. The pupal stage lasts two to three days.

- A. True
- B. False

99. Female mosquitoes are ready to bite one to two months after adult emergence.

- A. True
- B. False

100. Male mosquitoes do not bite but feed on flower nectar or plant juices. Some mosquitoes have only one generation per year, whereas others may have four or more. Adults may fly 5 to 10 miles, but usually rest in grass, shrubbery or other foliage close to the water breeding area.

- A. True
- B. False

Pesticide Identification Section

101. Naled target larvae in the breeding habitat before they can mature into adult mosquitoes and disperse.

- A. True
- B. False

102. Larvicides include the bacterial insecticides *Bacillus thuringiensis israelensis* and *Bacillus sphaericus*, the insect growth inhibitor methoprene, and the organophosphate insecticide Naled.

- A. True
- B. False

103. Mineral oils and other materials form a thin film on the surface of the water which cause larvae and pupae to drown.

- A. True
- B. False

104. Liquid larvicide products are applied directly to water using backpack sprayers and truck or aircraft-mounted sprayers. Tablet, pellet, granular, and briquette formulations of larvicides are also applied by mosquito controllers to breeding areas.

- A. True
- B. False

105. Homeowners may apply Mosquito Dunks (made with *Bacillus thuringiensis* Berliner var. *israelensis* or B.t.i.) to kill mosquito larvae in the water. This natural ingredient is harmless to other living things and is biodegradable.

- A. True
- B. False

106. Sevin is another safe material for control of mosquito larvae. It is an insect hormone which retards the development of larvae (disrupts molting) and prevents mosquitoes from developing into adults.

- A. True
- B. False

107. Altosid XR Briquettes can be placed even on ice for season-long control. Treat swamps, ponds, and marsh areas in early winter before thawing. These extended-release briquettes will provide up to 10 days of uninterrupted mosquito control once they hit the water.

- A. True
- B. False

108. The product known as **Bti** (*Bacillus thuringiensis israeliensis*) can be as effective as chemical insecticides. When the bacteria Bti encysts, it produces a protein crystal toxic to mosquito and midge larvae. Once the bacteria has been ingested, the toxin disrupts the lining of the larvae's intestine. It has no effect on a vast array of other aquatic organisms except midges in the same habitat. Bti strains are sold under the names Bactimos®, Teknar® and Vectobac®.

- A. True
- B. False

109. Oils have always been used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. The only other option would be draining the source. Closer surveillance and timing of other agents and techniques can greatly reduce the need for larvicidal oils.

- A. True
- B. False

110. Costs and complexity of mosquito control have increased markedly since the passage of the Environmental Protection Act in 1969. The increasing number of governmental regulations and permitting bodies, rising costs of alternative chemicals and the spreading resistance of many vector species to existing pesticides have almost completely changed or eliminated the use of chemical control agents.

- A. True
- B. False

111. Chlorinated hydrocarbons like DDT and Chlordane are easy to use and should be distributed, as are the use of Organophosphate and Carbamate insecticides.

- A. True
- B. False

112. Chlorinated hydrocarbons were invented for the US market in 1964, and in 1987.

- A. True
- B. False

113. Adult mosquito control may be undertaken to combat an outbreak of mosquito-borne disease or a very heavy nuisance infestation of mosquitoes in a community.

- A. True
- B. False

114. Pesticides registered for the use of adulticides can be applied either by aircraft or on the ground employing truck-mounted sprayers.

- A. True
- B. False

115. State and local agencies commonly use the organophosphate insecticides Sevin and Dursban and the synthetic pyrethroid insecticides permethrin, resmethrin, and sumithrin for adult mosquito control.

- A. True
- B. False

116. Mosquito adulticides are applied as ultra-low volume (**ULV**) sprays. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill flying mosquitoes on contact. ULV applications involve large quantities of pesticide active ingredient in relation to the size of the area treated, typically less than 5 ounces per acre, which minimizes exposure and risks to people and the environment.

- A. True
- B. False

117. The technique used for adult mosquito control is known as ultra-low volume (**ULV**) spray.

- A. True
- B. False

118. A large quantity of the pesticide is atomized into tiny particles and broadcast in a fog that drifts into sites where the larva mosquitoes hide. At best control is achieved up to 700 feet away, but it does help reduce the numbers of biting mosquitoes to tolerable levels. In recent years the use of vehicle-mounted units has decreased in favor of small, hand-carried dispersal units. This allows a more precise application of the pesticide.

- A. True
- B. False

119. The pesticide used for ULV spraying is **Sevin**, a naturally occurring substance harvested from two species of Old World chrysanthemums, or pyrethrum flowers.

- A. True
- B. False

120. This material is the most toxic available for mosquito control, and it degrades into toxic by-products within 4 to 6 hours after spraying.

- A. True
- B. False

121. Space sprays or aerosol "**bombs**," containing synergized pyrethrins 0.1%, are effective against adult mosquitoes. Frequent treatments may be needed during problem periods.

- A. True
- B. False

122. Space sprays or aerosol foggers, containing pyrethrins, will give rapid knockdown of adult mosquitoes. However, it is a temporary treatment with little residual effect.

- A. True
- B. False

123. Residual sprays applied to tall grasses, weeds, trees, shrubs, and outbuildings, one to two days before use of the area, are effective. Use water solution or emulsions instead of oil-based formulations to prevent plant injury.

- A. True
- B. False

124. Some insecticides registered for residual mosquito control include: carbaryl (**Sevin**), chlorpyrifos (**Dursban**) and Malathion. There are a number of different formulations available.

- A. True
- B. False

125. Malathion and carbaryl (**Sevin**) are extremely friendly to honey bees. Spray plants when in bloom. Mow weedy areas after treatment. Bee losses are minimized by spraying late in the afternoon when bees are gone or when temperatures are below 45 deg F. Malathion and methoxychlor are not toxic to fish.

- A. True
- B. False

126. Mosquito fish can eat 10 to 20 larvae per day. They play an important role in mosquito control in ponds, canals, irrigated fields and some other freshwater sources.
A. True
B. False
127. Mosquito fish live twenty to thirty years; they are live-bearing and produce 1 to 1 broods each year.
A. True
B. False
128. Release of mosquito fish in open freshwater situations should only be done by certified vector technicians.
A. True
B. False
129. Repellents applied to the skin and clothing will prevent mosquito bites for one to five hours depending on the person, type, and number of mosquitoes and the type and percent of active ingredient in the repellent.
A. True
B. False
130. Repellents are available as aerosol sprays, pump sprays, creamsticks, lotions, or foams.
A. True
B. False
131. N, N-Diethyl-m-toluamide (**Deet**) is not very effective and is not widely used as a repellent and it should not be used indiscriminately as severe allergies can develop.
A. True
B. False
132. Formulations containing high concentrations of Deet, 50% or more, should not be used on children. Formulations containing 5 to 10% Deet will work just as well as those containing 90% or more, however, they will not last as long.
A. True
B. False
133. Avon **Skin-So-Soft** has been widely used as a mosquito "**insecticide**" for a number of years without being labeled.
A. True
B. False
134. Since most of the mosquitoes that transmit encephalitis can travel very far, the risk of contracting encephalitis cannot be minimized by controlling the mosquito breeding sites which are in close proximity to your home. Water management, to prevent mosquito breeding, is recommended for control. Eggs can even hatch outside water.
A. True
B. False

135. Remove old tires, buckets, tin cans, glass jars, broken toys and other water-catching devices. Change water in bird baths and wading pools once or twice a week; clean out roof gutters holding stagnant water; and place tight covers over cisterns, cesspools, septic tanks, barrels, and tubs where water is stored.

- A. True
- B. False

136. Naled is an organophosphate (**OP**) insecticide that has been registered for use in the United States since 1956. It is used in agriculture, residential gardens, public recreation areas, and in public health pest control programs. When applied in accordance with the rate of application and safety precautions specified on the label, Naled can be used to kill mosquitoes without posing unreasonable risks to human health or the environment.

- A. True
- B. False

137. The mosquito goes through four distinct stages during its life cycle: egg, larva, pupa, and adult.

- A. True
- B. False

138. BTI is an **adulticides**, used to kill adult mosquitoes. In mosquito control programs conducted by state or local authorities, malathion is applied by truck-mounted or aircraft-mounted sprayers.

- A. True
- B. False

139. Malathion is applied as an ultra-low volume (**ULV**) spray. ULV sprayers dispense very fine aerosol droplets that stay aloft and kill mosquitoes on contact. ULV applications involve small quantities of pesticide active ingredient in relation to the size of the area treated. For mosquito control, malathion is applied at a maximum rate of 0.23 pounds (or about 2.5 fluid ounces) of active ingredient per acre, which minimizes exposure and risks to people and the environment.

- A. True
- B. False

140. Malathion cannot be used for public health mosquito control programs without posing un-reasonable risks to the general population when applied according to the label.

- A. True
- B. False

141. Because of the very small amount of active ingredient released per acre of ground, the estimates found that for all scenarios considered, exposures were hundreds or even thousands of times below an amount that might pose a health concern.

- A. True
- B. False

142. These estimates assumed several spraying events over a period of weeks, and also assumed that a toddler would ingest some soil and grass in addition to skin and inhalation exposure.

- A. True
- B. False

143. However, at very low doses, malathion, like other organophosphates, can over stimulate the nervous system causing nausea, dizziness, or confusion. Severe low-dose poisoning with any organophosphate can cause convulsions, respiratory paralysis, and death.

- A. True
- B. False

144. Malathion used in mosquito control programs does not pose unreasonable risks to wildlife or the environment.

- A. True
- B. False

145. Malathion does not degrade in the environment, especially in moist soil, and it displays high toxicity to birds and mammals.

- A. True
- B. False

146. Prevention programs, such as elimination of any standing water that could serve as a breeding site, help reduce the adult mosquito population and the need to apply other pesticides for adult mosquito control.

- A. True
- B. False

147. Most pesticides can be considered 100 percent safe, pesticide applicators and the general public should always but not required to exercise care and follow specified safety precautions during use to reduce risks.

- A. True
- B. False

148. Adulticides kill mosquito larvae. Adulticides include biological insecticides, such as the microbial larvicides **Bacillus sphaericus** and **Bacillus thuringiensis israelensis**.

- A. True
- B. False

149. Larvicides do not include other pesticides, such as temephos, methoprene, oils, and monomolecular films.

- A. True
- B. False

150. Larvicide treatment of breeding habitats help increase the adult mosquito population in nearby areas.

- A. True
- B. False

151. State and local agencies in charge of mosquito control typically employ a variety of techniques in an Integrated Pest Management (**IPM**) program.

- A. True
- B. False

152. An IPM approach includes surveillance, source reduction, larviciding and adulticiding to control mosquito populations.
A. True
B. False
153. Since mosquitoes do not need water to breed, source reduction cannot be as simple as turning over trapped water in a container to undertaking large-scale engineering and management of marsh water levels.
A. True
B. False
154. Larviciding involves applying pesticides to breeding habitats to kill mosquito larvae.
A. True
B. False
155. Larviciding can reduce overall pesticide usage in a control program.
A. True
B. False
156. Killing mosquito larvae before they emerge as adults can reduce or eliminate the need for ground or aerial application of pesticides to kill adult mosquitoes.
A. True
B. False
157. Microbial larvicides are bacteria that are registered as pesticides for control of mosquito larvae in outdoor areas such as irrigation ditches, flood water, standing ponds, woodland pools, pastures, tidal water, fresh or saltwater marshes, and storm water retention areas.
A. True
B. False
158. The microbial larvicides used for mosquito control are *Bacillus thuringiensis israelensis* (**Bti**) and *Bacillus sphaericus* (**B. sphaericus**).
A. True
B. False
159. ***Bacillus thuringiensis israelensis*** is a manmade bacterium registered for control of mosquito larvae. Bti was first registered by the EPA as an insecticide in 1993.
A. True
B. False
160. Mosquito larvae eat the Bti product that is made up of the dormant spore form of the bacterium and an associated pure toxin.
A. True
B. False
161. The toxin disrupts the gut in the mosquito by binding to receptor cells present in insects, and reluctantly in mammals too.
A. True
B. False

162. There are 400 **Bti** products registered for use in the United States. Aquababy, Tennar, Vectorbact, and LarvX are examples of common trade names for the mosquito control products.

- A. True
- B. False

163. **VectoLex CG** and **WDG** are registered ***B. sphaericus*** products and are effective for approximately one to four months after application.

- A. True
- B. False

164. Naled is a compound first registered by the EPA in 1975 that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae.

- A. True
- B. False

165. It is applied to water to kill mosquito larvae, and it may be used along with other mosquito control measures in an IPM program.

- A. True
- B. False

166. Sevin is the name of the methoprene product used in mosquito control and is applied as briquettes (similar in form to charcoal briquettes), pellets, sand granules, and liquids. The liquid and pelletized formulations can be applied by helicopter and fixed-wing aircraft.

- A. True
- B. False

167. Methoprene, used for mosquito control according to its label directions, does not pose unreasonable risks to human health. In addition to posing low toxicity to mammals, there is little opportunity for human exposure, since the material is applied directly to ditches, ponds, marshes, or flooded areas that are not drinking water sources.

- A. True
- B. False

168. Methoprene used in mosquito control programs does pose unreasonable risks to wildlife or the environment.

- A. True
- B. False

169. Toxicity of methoprene to birds and fish is high, and it is toxic to bees. Methoprene does not break down quickly in water and soil and will not leach into ground water.

- A. True
- B. False

170. Temephos mosquito control products present minimal acute and chronic risk to freshwater fish, freshwater invertebrates, and estuarine species.

- A. True
- B. False

171. Methoprene is an organophosphate (**OP**) pesticide registered by the EPA in 1965 to control mosquito larvae, and it is the only organophosphate with larvicidal use. It is an important resistance management tool for mosquito control programs; its use helps prevent mosquitoes from developing resistance to the bacterial larvicides.

- A. True
- B. False

172. Temephos is used in areas of standing water, shallow ponds, swamps, marshes, and intertidal zones. It may be used along with other mosquito control measures in an IPM program.

- A. True
- B. False

173. Dursban is the trade name of the temephos product used for mosquito control.

- A. True
- B. False

174. Temephos is applied most commonly by helicopter but can be applied by backpack sprayers, fixed-wing aircraft, and right-of-way sprayers in either liquid or granular form.

- A. True
- B. False

175. Temephos, applied according to the label for mosquito control, does not pose unreasonable risks to human health. It is applied to water, and the amount of temephos is very small in relation to the area covered, less than 1 ounce of active ingredient per acre for the liquid and 8 ounces per acre for the granular formulations.

- A. True
- B. False

When finished, please e-mail the answers and registration form to info@tlch2o.com or fax to (928) 272-0747. If you paid on the Internet, please write your customer number on your registration form.

Thank you for your business.