For Teachers: Please have the students read the sentences one at a time and correct their pronunciation of each sentence then have them repeat after you. Wait until after they read the sentence (use the number in place of the missing word) to have the students choose the correct answer to fill in the blank. When the students finish the article, move on to the further questions.

日本語訳なしタイプ B もございます。スクロールダウンするとございますのでお好きな方をご利用下さい。

3[A] – Honey Bees (みつばち) and CCD

Version3 G1 11-1

1. Honeybees are best own for their honey, but their most important role is actually in the pollination (授粉（じゅふん）) of more than 90 types of agricultural crops (農作物（のうさくもつ）).
2. It is estimated that honeybees contribute to the production of a staggering (驚（おどろ）くほどの) $14.6 billion worth of crops annually (年間（ねんかん）で) in the United States alone.
3. In fact, many professional beekeepers (養蜂家（ようほうか）) make most of their income by renting (貸（か）すこと) their hives (みつばちの巣箱（すばこ）) to orchards (果樹園（かじゅえん）) and farms during pollination season.
4. Since 2005, however, a mysterious syndrome (症候群（しょうこうぐん）) called colony collapse disorder (蜂群崩壊症候群（ほうぐんほうかいしょうこうぐん）) (CCD) has had a profound (重大（じゅうだい）な) effect on North American honeybee colonies. CCD devastates (荒（あ）らす) previously (これまで) flourishing (繁茂（はんも）している) colonies, leaving just the queen and a few young as all the adult worker bees fly away from the hive and die.
5. The bees that remain (残（のこ）る) are typically found to be weakened (弱（よわ）って) by disease, suggesting their immune (免疫（めんえき）の) systems have been compromised (低下（ていか）した).
6. CCD has already reduced the number of honeybee colonies in the United States by as much as 40 percent.
7. Should the colonies be affected even more severely (ひどく), crop yields (収穫（しゅうかく）) would be hit hard as the demand for pollination could not be met.
8. Consumers (消費者（しょうひしゃ）) would be saddled (負（お）わされる) with an unprecedented (空前（くうぜん）の) rise in produce prices and face a shortage of numerous (多（おお）くの) staple (主要（しゅよう）な) foods.

Further Questions&A

*Ask student to answer the question on their own at first. If the student can't answer correctly, have him look at the last page and read the "example answer" for the question. Have the student try to memorize the answer, if it's too long or difficult, you should divide the sentence into 2 or 3 parts to make it easier to remember. Once they have memorized the answer, the teacher should ask the question one last time so that the student can practice answering. Also if you find any mistakes, please mark the page and let me know ASAP.

9. 1) What is the most important role of honeybees? みつばちの最（もっと）も重要（じゅうよう）な役目（やくめ）は何（なん）ですか。

The most important role of honeybees is the pollination of more than 90 types of agricultural crops.

10. 2) How much do honeybees contribute to the production of crops?
11. みつばちは、農作物（のうさくもつ）の生産（せいさん）にいくらくらい貢献（こうけん）していますか。

Honeybees contribute to the production of $14.6 billion worth of crops annually.

12. 3) What does CCD do to a bee colony? CCD ははちの群（む）れに対（たい）してどんなことをしますか。
13. It devastates a previously flourishing colony, leaving just the queen and a few young.

14. A myriad of (無数（むすう）の) factors, including pesticides (農薬（のうやく）), climate change, and even cell-phone (携帯電話（けいたいでんわ）) radiation (放射線（ほうしゃせん）) have been investigated (調査（ちょうさ）された) in attempts to (～するために) determine the cause of CCD.

15. A team lead by University of Montana (モンタナ大学（だいがく）) researcher (研究員（けんきゅういん）) Jerry Bromenshenk, however, believes it has finally put (put～to rest で）～を解決（かいけつ）する) the mystery to rest.

16. Using a technique known as mass spectrometry (質量分析（しつりょうぶんせき）), in which samples of materials can be separated into their molecular components (分子成分（ぶんしせいぶん）), the team analyzed (分析（ぶんせき）した) honeybees from hives that had fallen victim to (～の犠牲（ぎせい）になった) CCD in different locations across North America.

17. In all the affected bees, they found proteins (たんぱく質（しつ）) belonging to two particular pathogens (病原体（びょうげんたい）) : Nosema ceranae (ノゼマ原虫（げんちゅう）), a single-celled (単細胞（たんさいぼう）の) fungus (菌（きん）), and invertebrate iridescent virus (無脊椎動物虹色（むせきついどうぶつにじいろ）ウイルス) (IIV), a virus never before found in North America.

18. When honeybees from hives in Australia—where CCD has yet to occur—and from CCD-free (CCD にかかっていない) hives in the state of Montana were analyzed, neither *Nosema ceranae* proteins nor IIV proteins were discovered.

19. Subsequent (その後（ご）の) laboratory (研究所（けんきゅうしょ）) tests showed that each pathogen in isolation (単独（たんどく）で) is not deadly but that a combination (組（く）み合（あ）わせ) of the two results in certain death for most honeybees.

20. The way the two pathogens interact (互（たが）い影響（えいきょう）しあう) to trigger (引（ひ）き起（お）こす) CCD is still unknown.

21. "They're cofactors (補助因子（ほじょいんし）), that's all we can say at the moment," admits Bromenshenk.

Further Questions&A

22. **4) What is mass spectrometry?** 質量分析（しつりょうぶんせき）とは何（なん）ですか。

Mass spectrometry is a technique in which samples of materials can be separated into their molecular components.

23. **5) What are the two pathogens that Bromenshenk believes are responsible for CCD?** ブロメンシェンク氏（し）が、CCD の原因（げんいん）であると考（かんが）えている二（ふた）つの病原体（びょうげんたい）は何（なん）ですか。

He believes that Nosema cernae, a single-celled fungus, and invertebrate iridescent virus (IIV), a virus never before found in North America, are responsible.

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24. Bromenshenk's findings have been questioned (疑（うたが）われている), however.

25. Dr. James Frazier, an entomologist (昆虫学者（こんちゅうがくしゃ）) and Penn State University, believes Bromenshenk has been too quick to discount (無視（むし）する) the role of pesticides. Frazier says research in Europe has proven (証明（しょうめい）した) that contamination (汚染（おせん）) by certain pesticides makes hives susceptible (影響（えいきょう）を受（う）けやすい) to CCD.

26. He also notes that Bromenshenk runs a company that develops equipment for
(見（み）つける 病気（びょうき）を引（ひ）き起（お）こす)
detecting disease-causing pathogens in bees, and as such would benefit if
(～のせいにされる 生物学的（せいぶつがくてき）な 伝染病（でんせんびょう）)
CCD were blamed on a biological contagion rather than
(農薬（のうやく）)
agricultural chemicals.

27. Moreover, Bromenshenk is (～で訴（うった）えられている) accused of having a (利害対立（りがいたいりつ）) conflict of interest
(一方（いっぽう）で) (相当（そうとう）な)
on another front, as he received substantial funding for research from a
pesticide company (～に関係（かんけい）している) implicated in honeybee deaths in Europe.

28. Until widely accepted conclusions can be made about CCD, Frazier
(強調（きょうちょう）する)
emphasizes the necessity of continued research into all potential causes.

Further Questions&A

29. **6) What does Dr. Frazier feel Bromenshenk has been too quick to dismiss?**

30. フレーザー博士（はかせ）は、ブロメンシェンク氏が早々（はやばや）と無視（むし）したのは何（なん）だと考（かんが）えていますか。

He feels that Bromenshenk has been too quick to dismiss the role of pesticides.

31. **7) What does Bromenshenk's company develop?**

32. ブロメンシェンク氏の会社（かいしゃ）が開発（かいはつ）しているのは何（なん）ですか。

He develops equipment for detecting disease-causing pathogens in bees.

33. **8) Why would Dr. Frazier feel that the funding Bromenshenk received from a pesticide company be a conflict of interest?**

34. フレーザー博士（はかせ）が、ブロメンシェンク氏が農薬会社（のうやくがいしゃ）から受（う）け取（と）った資金（しきん）が利害対立（りがいたいりつ）になると考（かんが）えているのはなぜですか。

The company that funded Bromenshenk has been implicated in honeybee deaths in Europe and wants to create evidence that they are not to blame for CCD.

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35. ***Choose the correct answer from these choices.**

36. **(32) What does the author of the passage say about the future implications of CCD?** この文章（ぶんしょう）の著者（ちょしゃ）は、CCD が将来（しょうらい）に及（およ）ぼす影響（えいきょう）について何（なん）と言（い）っていますか。

37. 1. If CCD continued to spread, honey could (～になる) cease to be the (主（おも）な) primary source of income for beekeepers as most consumers could no longer afford it.

38. 2. Disease carried by (感染（かんせん）した) infected honeybees will (汚染（おせん）する) contaminate orchards and
(大規模（だいきぼ）な)
farms, affecting the quality of produce and causing massive food shortages.

39. 3. A further reduction in the number of honeybees available for crop pollination would have a major impact on the food supply.

40. 4. Even if CCD were to (なくなる) vanish, the fact that it has already reduced the number of honeybee colonies by 40 percent means many crop yields will fail to recover.

41. **(33) Which statement best summarizes the findings of Bromenshenk's team?**

42. ブロメンシェンクのチームの発見（はっけん）を要約（ようやく）した以下（いか）の文（ぶん）のうち最（もっと）も正（ただ）しいものはどれですか。

43. 1. Although the (大規模（だいきぼ）な) mass death of honeybees involves many factors, colonies are more vulnerable to CCD where cell-phone radiation is strong.

44. 2. Two different pathogens that (個々（ここ）には) individually are not (致命的（ちめいてき）な) fatal for
(どういうわけか)
honeybees somehow cause CCD when both are present in honeybees.

3. CCD causes honeybees to lose the ability to breakdown (破壊（はかい）する) and absorb (奪（うば）う) proteins from their food, which is what weakens (弱（よわ）らせる) and eventually (結局（けっきょく）は) kills them.

4. Honeybees taken from supposedly (推定（すいてい）では～と思（おも）われる) CCD-free Australian hives were suffering from a similar syndrome, albeit (たとえ～でも) a nondeadly (致命的（ちめいてき）ではない) one.

(32) James Frazier is critical of the study led by Bromenshenk in part because

ジェームス・フレイザーはブロメンシェンクが筆頭研究者（ひっとうけんきゅうしゃ）である研究（けんきゅう）に批判的（ひはんてき）です。その理由（りゆう）の一（ひと）つは・・・

1. it focused on the effects of agricultural chemicals on honeybees while ignoring (無視（むし）する) other possible causes of CCD suggested by European research.

2. the effects of recent changes in laws governing (管理（かんり）する) the importation (輸入（ゆにゅう）) and use of foreign pesticides in North America were not taken into account (考慮（こうりょ）される).

3. Bromenshenk has ties (つながり) to companies that stand to (～の立場（たちば）にある) gain (得（え）る) an advantage (利益（りえき）) if CCD is found to be the result of natural rather than man-made (人為的（じんいてき）な) factors.

4. the equipment developed by Bromenshenk to measure levels of disease-causing agents (力（ちから）) in honeybees has not been tested by independent researchers.

Review Questions

1) What is the most important role of honeybees?

The most important role of honeybees is the pollination of more than 90 types of agricultural crops.

2) How much do honeybees contribute to the production of crops?

Honeybees contribute to the production of $14.6 billion worth of crops annually.

3) What does CCD do to a bee colony?

It devastates a previously flourishing colony, leaving just the queen and a few young.

4) What is mass spectrometry?

Mass spectrometry is a technique in which samples of materials can be separated into their molecular components.

5) What are the two pathogens that Bromenshenk believes are responsible for CCD?

He believes that Nosema cernae, a single-celled fungus, and invertebrate iridescent virus (IIV), a virus never before found in North America, are responsible.

6) What does Dr. Frazier feel Bromenshenk has been too quick to dismiss?

He feels that Bromenshenk has been too quick to dismiss the role of pesticides.

7) What does Bromenshenk's company develop?

He develops equipment for detecting disease-causing pathogens in bees.

8) Why would Dr. Frazier feel that the funding Bromenshenk received from a pesticide company be a conflict of interest?

The company that funded Bromenshenk has been implicated in honeybee deaths in Europe and wants to create evidence that they are not to blame for CCD.

解答: (32) 3 (33) 2 (34) 3

Type B 日本語訳なし

3[A] – Honey Bees and CCD

Version3 G1 11-1

69. Honeybees are best own for their honey, but their most important role is actually in the pollination of more than 90 types of agricultural crops.
70. It is estimated that honeybees contribute to the production of a staggering $14.6 billion worth of crops annually in the United States alone.
71. In fact, many professional beekeepers make most of their income by renting their hives to orchards and farms during pollination season.
72. Since 2005, however, a mysterious syndrome called colony collapse disorder (CCD) has had a profound effect on North American honeybee colonies.
73. CCD devastates previously flourishing colonies, leaving just the queen and a few young as all the adult worker bees fly away from the hive and die.
74. The bees that remain are typically found to be weakened by disease, suggesting their immune systems have been compromised.
75. CCD has already reduced the number of honeybee colonies in the United States by as much as 40 percent.
76. Should the colonies be affected even more severely, crop yields would be hit hard as the demand for pollination could not be met.
77. Consumers would be saddled with an unprecedented rise in produce prices and face a shortage of numerous staple foods.

Further Questions&A

78. 1) What is the most important role of honeybees?
79. 2) How much do honeybees contribute to the production of crops?
80. 3) What does CCD do to a bee colony?

81. A myriad of factors, including pesticides, climate change, and even cell-phone radiation have been investigated in attempts to determine the cause of CCD.
82. A team lead by University of Montana researcher Jerry Bromenshenk, however, believes it has finally put the mystery to rest.
83. Using a technique known as mass spectrometry, in which samples of materials can be separated into their molecular components, the team analyzed honeybees from hives that had fallen victim to CCD indifferent locations across North America.
84. In all the affected bees, they found proteins belonging to two particular pathogens: Nosema ceranae, a single-celled fungus, and invertebrate iridescent virus (IIV), a virus never before found in North America.
85. When honeybees from hives in Australia—where CCD has yet to occur—and from CCD-free hives in the state of Montana were analyzed, neither *Nosema ceranae* proteins nor IIV proteins were discovered.
86. Subsequent laboratory tests showed that each pathogen in isolation is not deadly but that a combination of the two results in certain death for most honeybees.

87. The way the two pathogens interact to trigger CCD is still unknown.
88. "They're cofactors, that's all we can say at the moment," admits Bromenshenk.

Further Questions&A

89. 4) What is mass spectrometry?
90. 5) What are the two pathogens that Bromenshenk believes are responsible for CCD?

91. Bromenshenk's findings have been questioned, however.
92. Dr. James Frazier, an entomologist and Penn State University, believes Bromenshenk has been too quick to discount the role of pesticides.
93. Frazier says research in Europe has proven that contamination by certain pesticides makes hives susceptible to CCD.
94. He also notes that Bromenshenk runs a company that develops equipment for detecting disease-causing pathogens in bees, and as such would benefit if CCD were blamed on a biological contagion rather than agricultural chemicals.
95. Moreover, Bromenshenk is accused of having a conflict of interest on another front, as he received substantial funding for research from a pesticide company implicated in honeybee deaths in Europe.
96. Until widely accepted conclusions can be made about CCD, Frazier emphasizes the necessity of continued research into all potential causes.

Further Questions&A

97. 6) What does Dr. Frazier feel Bromenshenk has been too quick to dismiss?
98. 7) What does Bromenshenk's company develop?
99. 8) Why would Dr. Frazier feel that the funding Bromenshenk received from a pesticide company be a conflict of interest?

100. *Choose the correct answer from these choices.

101. (32) What does the author of the passage say about the future implications of CCD?
102. 1. If CCD continued to spread, honey could cease to be the primary source of income for beekeepers as most consumers could no longer afford it.
103. 2. Disease carried by infected honeybees will contaminate orchards and farms, affecting the quality of produce and causing massive food shortages.
104. 3. A further reduction in the number of honeybees available for crop pollination would have a major impact on the food supply.
105. 4. Even if CCD were to vanish, the fact that it has already reduced the number of honeybee colonies by 40 percent means many crop yields will fail to recover.

106. (33)Which statement best summarizes the findings of Bromenshenk's team?

107. 1. Although the mass death of honeybees involves many factors, colonies are more vulnerable to CCD where cell-phone radiation is strong.
108. 2. Two different pathogens that individually are not fatal for honeybees somehow cause CCD when both are present in honeybees.
109. 3. CCD causes honeybees to lose the ability to breakdown and absorb proteins from their food, which is what weakens and eventually kills them.

4. Honeybees taken from supposedly CCD-free Australian hives were suffering from a similar syndrome, albeit a nondeadly one.

(32)James Frazier is critical of the study led by Bromenshenk in part because

1. it focused on the effects of agricultural chemicals on honeybees while ignoring other possible causes of CCD suggested by European research.
2. the effects of recent changes in laws governing the importation and use of foreign pesticides in North America were not taken into account.
3. Bromenshenk has ties to companies that stand to gain an advantage if CCD is found to be the result of natural rather than man-made factors.
4. the equipment developed by Bromenshenk to measure levels of disease-causing agents in honeybees has not been tested by independent researchers.

Review Questions

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The company that funded Bromenshenk has been implicated in honeybee deaths in Europe and wants to create evidence that they are not to blame for CCD.

解答: (32) 3 (33) 2 (34) 3