EXAM KEY

IDENTIFICATION
(each correct answer is worth 2 points)

1. stalk borer larvae
2. leafhoppers
3. rice water weevil pupae
4. long-horned grasshoppers
5. rice water weevil larvae
6. rice stink bug adults
7. rice stink bug nymphs
8. fall armyworms
9. chinch bugs
10. rice water weevil adults
11. hornworm

Items 12-19 are from the milling process and seed identification information. Identify each sample.

12. This rice comes directly from the combine. What is it called? rough rice
13. This rice does not have hulls. What is it called? brown rice
14. This rice has the bran layer removed leaving whole and broken grains. What is this rice called? milled rice
15. This rice has the bran layer removed and broken grains removed. What is this rice called? whole or head rice
16. This rice is left over after milling and whole grains removed. What is this rice called? brokens
17. This rice is subjected to a steam or hot water treatment before milling. What is this rice called? parboiled
18. What kind of rice will grow from these seeds? (hint: this is a major weed pest)  
red rice

19. This seed has been hulled so you can see the bran layer. From what weed were these seeds produced?  
red rice

In items 20 and 21 identify the disease.

20. narrow brown leaf spot

21. panicle blight

22. What caused this damage to this panicle?  
black birds

In items 23-43 identify the common name of the weeds/plants and answer the questions.

23. broadleaf signalgrass

24. dayflower

25. ducksalad

26. sedge

27. sprangletop

28. paspalum/vassey grass/dallis grass

29. sorghum

30. arrowhead

31. watergrass/barnyard grass

32. goose weed

33. morning glory

34. Texas weed

35. alligator weed
36. red stem/ammania

37. ratoon rice

38. hemp sesbania

39. sugarcane

40. johnsongrass

41. water primrose

42. soybeans

43. What are inside the nodules on the roots of this plant? bacteria

44. What function do these organisms perform? fix nitrogen for the plant

45. What group of plants fix nitrogen? legumes

**TRUE/FALSE**

*each correct answer is worth 1 point*

Circle Answer (T = True F = False)

46. The rice water weevil is a major pest of rice. T F

47. Grasshoppers are not major pests of rice. T F

48. The chinch bug has chewing mouthparts. T F

49. Rice water weevil adults feed on rice foliage. T F

50. Rice water weevils pupate in cocoons made of plant debris. T F

51. Rice stink bugs feed on developing grains. T F

52. Rice stink bug feeding can result in discolored rice which is called “pecky” rice. T F
### Ruben Stringer Memorial Texas Rice Education Contest 2015

#### EXAM KEY

**TRUE/FALSE (cont.)**
*(each correct answer is worth 1 point)*

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>53. The adult fall armyworm is a moth.</td>
<td>T</td>
</tr>
<tr>
<td>54. Generally, fall armyworms are more severe on rice before the permanent flood.</td>
<td>T</td>
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<tr>
<td>55. Flooding frequently controls chinch bugs attacking seedling rice.</td>
<td>T</td>
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<tr>
<td>56. Rice blast is caused by a fungus.</td>
<td>T</td>
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<tr>
<td>57. Sheath blight is caused by a fungus.</td>
<td>T</td>
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<td>58. Leaf blast will usually appear in the high areas of fields where the flood has been lost or is shallow.</td>
<td>T</td>
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<td>59. The blast pathogen overwinters on infected straw and leaves.</td>
<td>T</td>
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<tr>
<td>60. Agronomic practices that favor blast development include over-fertilizing with nitrogen.</td>
<td>T</td>
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<tr>
<td>61. Environmental conditions that favor blast development include high relative humidity and long dew periods.</td>
<td>T</td>
</tr>
<tr>
<td>62. Sheath blight is not favored by thick rice stands and high humidity.</td>
<td>T</td>
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<tr>
<td>63. Continuous rice (a given field planted in rice year after year) does increase the amount of sheath blight inoculum in the field.</td>
<td>T</td>
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<td>64. Fungicides are applied to control weeds.</td>
<td>T</td>
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<td>65. The sheath blight organism produces sclerotia which help the organism survive unfavorable environmental conditions.</td>
<td>T</td>
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<tr>
<td>66. The most commonly grown rice variety in Texas is an aromatic variety.</td>
<td>T</td>
</tr>
<tr>
<td>67. Clearfield 261 is a herbicide-resistant long grain rice variety.</td>
<td>T</td>
</tr>
<tr>
<td>68. Ducksalad is a grass weed.</td>
<td>T</td>
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</table>
**True/False (Cont.)**
*(each correct answer is worth 1 point)*

69. Rice is a broadleaf plant.  

   | T | F |
---|---|---|

70. Rice water weevil larvae obtain oxygen from rice roots.  

   | T | F |
---|---|---|

71. The node is the joint of a stem from which leaves or branches arise.  

   | T | F |
---|---|---|

72. Panicle blight causes poor grain filling.  

   | T | F |
---|---|---|

73. Panicle blight is associated with a bacterium, but not the environment.  

   | T | F |
---|---|---|

**Fill In The Blank**
*(each correct answer is worth 1 point)*

74. A chlorophyll meter is used to determine the need for **nitrogen**.

75. The three major fertilizer nutrients are phosphorus, potassium and **nitrogen**.

76. Sierra is an **aromatic** rice possessing the flavor and aroma of certain rice from Thailand.

77. Reduced height of varieties can result in **less/reduced** lodging.

78. **Ratoon/2nd** crop rice grows from main crop stubble.

79. The federal agency that regulates pesticide use in the United States is the **Environmental Protection Agency**.

80. The current Governor of Texas is, **Greg Abbott**, who graduated from Texas A&M and was a Texas Commissioner of Agriculture.

81. The current Texas Commissioner of Agriculture is **Sid Miller**.

82. A mite has an exoskeleton like an insect, but has **eight** legs.

83. The rice panicle mite may be associated with the **panicle blight** disease.
Circle 1 Letter Per Question

84. Research shows that an average of 1 rice water weevil larva per plant reduces yield
   a. 1000 lb/acre
   b. 500 lb/acre
   c. 300 lb/acre
   d. none of the above

85. In 2006, Louisiana’s rice production was much less than normal. Why?
   a. excessive hog damage
   b. Roundup drift from soybeans
   c. saltwater intrusion caused by Hurricanes Katrina and Rita
   d. price of rice was at a record low

86. South American rice miner larvae move down to the inside of developing leaves where
    they_______________ the leaves.
   a. roll
   b. blast
   c. mine
   d. fold

87. Populations of rice stink bug are generally higher _______________________.
   a. in soybeans
   b. near field margins
   c. near airports
   d. in June

88. Fall armyworms damage rice by______________________________.
   a. defoliation
   b. causing lodging
   c. pruning roots
   d. extracting nutrients from vascular tissue

89. Rice fields are flooded mainly to help control _________________________.
   a. diseases
   b. rice water weevils
   c. weeds
   d. rice stink bugs
90. Sometimes __________________________can be controlled by applying a permanent flood.
   a. rice water weevils
   b. fall armyworms
   c. South American rice miner
   d. leafhoppers

91. An average of only 1 adult __________________________ per plant can kill seedling rice.
   a. rice stink bug
   b. leafhopper
   c. pinworm
   d. chinch bug

92. __________________________ usually move in mass from weedy field margins to defoliate rice
   and broadleaf weeds.
   a. rice leaf miners
   b. blister beetles
   c. chinch bugs
   d. navyworms

93. Blackbirds are a pest of _____________________________.
   a. sprouting and heading rice
   b. tillering and booting rice
   c. rice in panicle differentiation
   d. postflood rice

94. Rice was grown on about __________________________ acres in Texas in 2014.
   a. 1 million
   b. 500,000
   c. 130,000
   d. 20,000

95. The morphology of rice is divided into the __________________________ phases (including
   germination, seedling, and tillering stages) and the reproductive phases (including panicle
   initiation and heading stages).
   a. beginning
   b. vegetative
   c. embryonic
   d. physiological
Show All Work

(Each correct answer is worth 1 point)

96. Hermione Granger has a 4000-acre rice farm that has a potential rice water weevil problem. She decided to apply the insecticide seed treatment “Where’s Harry?” at 0.05 lb active ingredient/100 lb seed. She planted the field at 80 lb seed/acre. How much active ingredient did she apply to her entire farm?

(4000 A)(80 lb seed/A) = 320,000 lb or 3200 cwt of seed; (3200 cwt)(0.05 lb ai) = 160 lb ai

97. “Where’s Harry?” contains 50% by weight active ingredient and 50% by weight inert ingredients. How much total “Where’s Harry?” did Ms. Granger apply to her 4000 acre farm?

160/0.5 = 320 lb product

98. “Where’s Harry?” costs $250/lb, so how much did Ms. Granger pay to treat her 4000 acre farm? How much did she spend on a per acre basis?

($250/lb)(320) = $80,000; $80,000/4000 = $20/A

99. Ms. Granger harvested her rice which yielded 8000 lb/acre. She received $10/100 lb rice. How much money did she receive on a per acre basis?

8000 lb = 80 cwt; (80 cwt)($10/cwt) = $800/A

100. Ms. Granger did not treat an adjacent field on her farm (same variety, cultural practices and soil properties but with no insecticide seed treatment). This field yielded 6000 lb/acre, so she estimated that the seed treatment increased her yields 2000 lb/acre. How much money did Ms. Granger make on a per acre basis by controlling her rice water weevil problem?

2000 lb = 20 cwt; 20 cwt x $10 = $200 - $20 = $180

101. M. Damon has a rice field next to a soybean field. His rice is dying downwind of the soybean field. What could cause M. Damon’s rice to die?

Herbicide applied to the field drifted onto rice field
Show All Work

102. The economic injury level is the population density of an insect which causes economic damage - cost of control is equal to the value of the increase in yield provided by the control. Assume an average of 1 rice insect per rice plant reduces rice yield 10 lb/acre. Assume this is a linear relationship, so 10 insects reduce yield 100 lb/acre. The cost of control is $18/acre. The price of rice is $10/100 lb or cwt. What is the economic injury level for this insect?

\[
\text{The cost of control ($18/A) = the value of 180 lb rice} \\
180 \text{ lb/(10 lb/insect) = 18 insects/plant}
\]

Fill In The Blank

103. Who is the current U.S. Secretary of Agriculture?

\underline{Tom Vilsak}

104. Who is the current United States Environmental Protection Agency Administrator?

\underline{Gina McCarthy}

105. What does GMO stand for and how has it influenced rice exports?

\underline{Genetically modified organism}

106. How many U.S. Senators represent Texas?

\underline{Two}

107. Name one current U.S. Senator from Texas.

\underline{John Cornyn or Ted Cruz}

108. What Aggie won the Nobel Peace Prize in 1970?

\underline{Dr. Norman Borlaug}

109. The above person was known as the “Father” of what revolution?

\underline{Green}
110. What was the significance of this revolution?
The revolution increased grain yields dramatically in India and other Asian countries which saved millions of lives from starvation.

111. What is Clearfield technology?
The Clearfield System offers, for the first time, the ability to selectively eliminate red rice from a production rice field with the use of an herbicide. The technology is based on an induced mutant resistant to imidazalinone herbicides. This mutant was developed by subjecting a large number of conventional rice seed to a chemical that can cause changes (mutations) in the genetic makeup of the seed. These seed were then planted and the resulting plants were sprayed with the herbicide. Naturally, most of the plants were susceptible and were killed by the herbicide. However, one plant survived the herbicide treatment and was resistant to the herbicide. This plant was resistant because the chemical had caused a subtle change in one enzyme system in that plant which allowed that plant to be resistant to the “imi” herbicides.

112. Who is Ted Poe?
U.S. House of Representatives member – represents SE Texas

113. Who is the Aggie mascot?
Reveille – collie dog

114. What is organic rice?
Grown without synthetic chemicals

115. Name a variety of organic rice?
Sierra, Jasmine 85, Della, Jazzman

116. What state has the most rice acreage?
Arkansas

117. What does the cross section of an ear of corn represent on the FFA emblem?
Common agricultural interests across the U.S.

118. What does the plow represent on the FFA emblem?
Hard work and dedication
119. What are the words on the FFA emblem?

"Agricultural Education"

120. What does the owl represent on the FFA emblem?

Knowledge and wisdom

121. West Nile Fever is a disease caused by a virus. What insect is responsible for transmitting this organism to humans?

Mosquito

122. What other animal is involved in the spread of West Nile?

birds

123. What kind of microorganism causes plague?

bacterium

124. What insect is involved in the transmission to humans?

fleas

125. When was the first Texas Rice Festival?

1969

126. What is the most popular rice variety grown in Texas?

Presidio

127. Who developed this variety?

Dr. Anna McClung

128. Why was rice acreage in Texas drastically reduced in the last 3 years?

Drought in 2011 resulted in very low water levels in lakes supplying rice water along the Colorado River. Low levels triggered water rationing, preventing water release for rice farms.
129. *Consumer Reports* published an article about an element found in US rice grain. What is this element and why the concern? (worth 2 pts.)

The element is arsenic – a heavy metal which can have detrimental human effects.

130. What is hybrid vigor?
Heterosis: increased function (like yield) expressed in offspring of parents of widely differing genetic composition

131. Name 1 hybrid rice variety?

XL753, XL723, XP754, XP760, XP4523, CLXL729, CLXL745, CLXP756, CLXP4534

132. Why is EPA concerned about neonicotinoids?

Honey bees

133. What island nation may buy Texas rice in the future?

Cuba

134. Why is this contest named after Mr. Ruben Stringer?
He was the Vo-Ag teacher for H-F High School and was responsible for organizing the Texas Rice Education Contest.