

NTSI 2026

Knowledge Check Review

[Archived 2025 Test]



[Please mark all answers on the answer sheet. You may write on this test]

1. If you want to increase the pH of the soil, what should you use?
 - a. Lime
 - b. Sulfur
 - c. Magnesium
 - d. Phosphorus
2. If you want to decrease the pH of the soil, what should you use?
 - a. Lime
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 - d. Phosphorus
3. A golf course with primarily warm-season grass covering all surfaces is looking for a green, aesthetically pleasing fairway for the winter. What method would you use for the cool-season grass to take over and provide a green color in the cooler temperatures?
 - a. Sodding
 - b. Plugging
 - c. Sprigging
 - d. Overseeding
4. What method is using pieces of grass stems placed over an entire area?
 - a. Sodding
 - b. Plugging
 - c. Sprigging
 - d. Overseeding
5. Which is an example of stressed turf?
 - a. Vibrant green color
 - b. Wilted, folded, or curled leaves
 - c. Watered daily
 - d. Nutrients given
6. Which nutrient promotes healthy roots and seed production?
 - a. Phosphorous
 - b. Potassium
 - c. Calcium
 - d. Nitrogen
7. Which nutrient is needed for physiological processes in plants and overall hardiness and vigor?
 - a. Phosphorus
 - b. Potassium
 - c. Calcium
 - d. Nitrogen



8. What type of mower consists of a blade that spins very rapidly in a horizontal fashion?
 - a. Flail
 - b. Gang
 - c. Reel
 - d. Rotary
9. Which mower type employs a scissor-like motion and are suited for grasses that will be cut less than 1”?
 - a. Rotary
 - b. Reel
 - c. Weedeater
 - d. Lopping Shears
10. Which turf management practice uses a machine to pull out cores or plugs of soil and the holes left in the soil allow the root zone to obtain more oxygen flow and water infiltration?
 - a. Thatch Control
 - b. Verticutting
 - c. Irrigation
 - d. Aeration
11. What does IPM stand for?
 - a. Individual Program Method
 - b. Insect Prevention Method
 - c. Integrated Pest Management
 - d. Integrated Pest Medicine
12. When irrigating, you should:
 - a. Water deep and infrequent
 - b. Water shallow and infrequent
 - c. Water deep and frequent
 - d. Water shallow and frequent
13. What are the three primary macronutrients?
 - a. Boron, Phosphorus, Magnesium
 - b. Zinc, Iron, Copper
 - c. Manganese, Nitrogen, Potassium
 - d. Nitrogen, Phosphorus, Potassium
14. What are microscopic invertebrate roundworms?
 - a. Nematodes
 - b. Bacteria
 - c. Fungi
 - d. Viruses



15. Which of the following is used to control annual weeds and is applied before the weed seeds germinate?
- Non-selective Herbicides
 - Pre-emergence Herbicides
 - Post-emergence Herbicides
 - Selective Herbicides
16. How does soil compaction caused by people and equipment traffic impact turfgrass?
- Grass roots begin to grow in the buildup of thatch
 - Loss of soil pore space puts stress on turfgrass
 - Soil compaction increases microbial activity
 - Turfgrass roots are literally crushed from the weight of the soil
17. What is the accumulation of excess live and dead grass stems and roots on the soil surface?
- Thatch
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 - Stolons
18. What is the best course of action to manage insect pests?
- A weekly application of preventative pesticide
 - Adherence to mowing and fertilizing schedules
 - An introduction of natural enemies of the insect pests
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19. Which of the following formulations is typically applied using a broadcasting method?
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22. Which of the following statements is true about: white grubs, mole crickets, billbugs, sod webworms, armyworms, and cutworms?
- They are all types of grubs
 - They all have chewing mouthparts
 - They all feed below the surface on the roots of turfgrass
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 - A weed that completes its life cycle in one year
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24. How are insect pests typically classified?
- By their method of locomotion
 - By the way they chirp or make sounds
 - By their length of winter hibernation
 - By the way they feed and where they feed
25. What part of a golf course has the highest mowing blade height and receives the least fertilization?
- Fairway
 - Fringe
 - Rough
 - Tee Box
26. _____ refers to the non-seed material in a bag of seed.
- Certified seed
 - Inert material
 - Germination percentage
 - Seed mixture
27. _____ is the process by which water is lost from plant tissues.
- Evapotranspiration
 - Evaporation
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- Contact insecticide
 - Stomach insecticide
 - Respiratory insecticide
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- Disease
 - Parasite
 - Pest
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- Poor shade tolerance
 - Poor heat tolerance
 - Poor germination
 - High potassium requirements
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- True
 - False
38. Optimal growth conditions for Warm Season Grasses include soil temps between 65 and 75° F.
- True
 - False
39. In general, the less photosynthetic tissue (shoots) means the plant will have less root growth
- True
 - False
40. The crown (apical meristem) is a stem.
- True
 - False
41. C3 grasses require light to germinate.
- True
 - False
42. Fine fescues need high amounts of irrigation and fertilizer to persist
- True
 - False
43. What is the section of a turfgrass stem that will form a leaf called?
- Collar
 - Node
 - Internode
 - Auricle
44. What is a turfgrass' growth habit if daughter plants are formed by lateral underground shoots?
- Rhizomatous
 - Stoloniferous
 - Bunch type
 - None of the above
45. What is a turfgrass' growth habit if daughter plants are formed by lateral aboveground shoots?
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- Bermuda grass
 - Fine fescues
 - Buffalo grass
 - Centipede grass
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- Insects
 - Diseases
 - Weeds
 - Nematodes
48. Which micronutrient can cause immediate green-up or dark green coloration?
- Boron
 - Nickel
 - Iron
 - Manganese
49. How can we tell whether the turf needs Nitrogen
- Color
 - Soil tests
 - Clippings
 - All of the above
50. Which macronutrient is most important in turfgrass growth
- Nitrogen
 - Phosphorus
 - Potassium
 - Potash
51. Which secondary macronutrient, when applied excessively, can raise the pH of the soil
- Phosphorus
 - Iron
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52. What is a major limitation to the widespread use of Bermudagrass in the transition zone and north?
- Weed invasion
 - Cold tolerance
 - Heat tolerance
 - Mowing tolerance



53. What should your irrigation strategy be immediately after seeding a new turf stand
- Light and frequent amounts of water
 - Heavy and infrequent amounts of water
 - Heavy water in the morning, lighter amounts at night
 - Light water in the morning, heavier amounts at night
54. Which of the following is NOT a vegetative establishment of turf?
- Sprigging
 - Stolonizing
 - Sodding
 - Seeding
55. Which C3 genus typically has the lowest fertility and water requirements?
- Poa
 - Lolium
 - Festuca
 - Agrostis
56. What is meant by vernation?
- Appendages occurring in pairs at the base of the plant
 - Above ground membranous structure behind the stem
 - The way the leaf is formed within the bud
 - Veins that run along the midrib of the leaf
57. What characteristics do all bluegrasses have in common?
- Rolled vernation
 - Folded vernation
 - Large pointed ligule
 - Ridged abaxial surface
58. What effects does high levels of Nitrogen have on Shoot density
- Increase
 - Decrease
 - No effect
59. What effects does high levels of Nitrogen have on Root growth
- Increase
 - Decrease
 - No effect
 - Not known
60. Where is the bench height of a reel mower calculated from?
- Between the roller and the reel
 - Between the rake angle and the relief angle
 - Between the top angle and the bedknife
 - Between the roller and the bedknife



61. How many pounds of N are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 2.4
 - 3.5
 - 7
 - 14
62. How many pounds of P are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 0.2
 - 0.22
 - 0.5
 - 2.2
63. How many pounds of K are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 1.72
 - 3.32
 - 3.44
 - 8
64. How much topdressing is needed to topdress 175,000 ft² of greens with a light (1/16 inch) topdressing?
- 34 cu.yds.
 - 102 cu.yds
 - 405 cu.yds
 - 911 cu. yds.
65. A 20-2-15 fertilizer is to be applied to the fairways at 0.75 lbs N/1000ft². There are 43 acres of fairways. How much fertilizer will be needed?
- 1405 lbs
 - 7024 lbs
 - 281 lbs
 - 4200 lbs
66. A 3 EC liquid insecticide has
- Has 3 lbs of active ingredient per gallon
 - Has 3 lbs of active ingredient per pound
 - Is 3 % active ingredient
 - All of the above
67. Creeping bentgrass is distinguished by the following features:
- stoloniferous growth, ridged adaxial leaf blades, and rolled vernation
 - stoloniferous growth, ridged abaxial leaf blades, and rolled vernation
 - stoloniferous growth, ridged adaxial leaf blades, and folded vernation
 - stoloniferous growth, ridged abaxial leaf blades, and folded vernation



68. Which warm-season turfgrass has the poorest shade adaptation?
- St. Augustinegrass
 - Zoysiagrass
 - Buffalograss
 - Bermudagrass
69. Which of the following warm-season turfgrasses is the most cold hardy?
- zoysiagrass
 - Seashore paspalum
 - common bermudagrass
 - hybrid bermudagrass
70. Of the following turfgrass species, which has the finest texture?
- rough bluegrass
 - tall fescue
 - red fescue
 - perennial ryegrass
71. Which one of the following turfgrasses can be identified by its fringe of hairs located on the ligules and collars?
- Bentgrass
 - Bermudagrass
 - Bluegrass
 - Seashore paspalum
72. Kentucky bluegrass differs from rough bluegrass by its:
- shorter ligule, glossy abaxial leaf and parallel-sided leaf blades
 - longer ligule, glossy adaxial leaf and tapering leaf blades
 - shorter ligule, dull abaxial leaf and parallel-sided leaf blades
 - longer ligule, dull abaxial leaf and tapering leaf blades
73. Kentucky bluegrass is distinguished by the following features:
- stoloniferous growth, folded vernation, and smooth adaxial leaf blades
 - rhizomatous growth, folded vernation, and smooth adaxial leaf blades
 - stoloniferous growth, rolled vernation, and smooth adaxial leaf blades
 - bunch-type growth, folded vernation, and ridged adaxial leaf blades
74. A _____ is an asexual reproductive structure that grows below the surface.
- Seed
 - Rhizome
 - Stolon
 - Root
75. Seashore Paspalum is primarily known for its



- a. exuberant color
 - b. salt tolerance
 - c. fine texture
 - d. Auricles
76. What is the material of plant or animal remains at various stages of decay?
- a. Nitrogen
 - b. Clipping yield
 - c. Organic Matter
 - d. Endophytes
77. Original golf courses in the British Isles were laid out across _____ that became known as linksland.
- a. Pavement
 - b. Sand Dunes
 - c. Street Alleys
 - d. Forest Clearings
78. The golf hole cut into a green measures:
- a. 2.25"
 - b. 3.25"
 - c. 4.25"
 - d. 5.25"
79. Sand dunes and their slip faces occurred naturally in linksland areas as a result of wind-driven movement of sand particles. Modern golf courses recreate these areas which are known as _____.
- a. Gullies
 - b. Barrancas
 - c. Bunkers
 - d. Ravines
80. Golf courses use a great deal of inputs and take up space that could be used for housing or farming, but also provide a space for recreation and sequester _____, which is considered an ecosystem service.
- a. Carbon
 - b. Hydrogen
 - c. Nitrogen
 - d. Oxygen
81. Soil texture is defined by the size of the _____
- a. Particle
 - b. Atom
 - c. Bond
 - d. Climate



82. Organic matter or _____ builds up as bacteria break down plant matter and leave behind fats and waxes

- a. Humus
- b. Lime
- c. Phosphoric acid
- d. Silt

83. pH is a measure of H^+ connections. A low pH would fall between

- a. 1-6
- b. 7
- c. 8-11
- d. 20-25

84. The phosphorus cycle is different than the Nitrogen cycle in that P can become immobilized or leech out/runoff of the local area through which if let to build up can cause _____ blooms

- a. Algal
- b. Sunflower
- c. Mushroom
- d. Clover

85. Much of the phosphorus that is applied on crops, including turfgrass, is lost.

- a. True
- b. False

86. When introducing more potassium into the soil, it often comes in the form of

- a. K_2O
- b. KOH
- c. P_2O_5
- d. N_2

87. Potassium can return to the soil when plant material is broken down by

- a. Decomposers
- b. Consumers
- c. Predators
- d. The Sun

88. Common fertilizers come in a package that includes Nitrogen, Phosphorus, and

_____.



- a. Potassium
 - b. Calcium
 - c. Manganese
 - d. Sodium
89. Growth in turfgrass occurs primarily at the _____ where the meristem tissue is located.
- a. Crown
 - b. Leaf tip
 - c. Seed
 - d. Seed coat
90. Turfgrass plants are dicots
- a. True
 - b. False
91. The products of photosynthesis include all the following except:
- a. CO₂
 - b. O₂
 - c. Glucose
 - d. H₂
92. Respiration uses O₂, Glucose, ATP, and NADPH to produce ATP
- a. True
 - b. False
93. Cool season grasses are C₃ plants, warm season grasses are C₄ plants
- a. True
 - b. False
94. The four primary factors for plant growth include:
- a. Light, temperature, moisture, and humidity
 - b. Shade, temperature, moisture, and humidity
 - c. Light, temperature, moisture, and disease
 - d. Light, temperature, nutrients, and humidity
95. Primary Benefits of turfgrass include all of the following except:
- a. All options are benefits
 - b. Erosion control
 - c. Traffic tolerance
 - d. Cooling effect
96. When talking about turfgrass characteristics, it is common to refer to turfgrass leaf width as
- a. Texture



- b. Density
 - c. Color
 - d. Uniformity
97. _____ refers to the number of shoots per defined area (typically an in²)
- a. Density
 - b. Texture
 - c. Color
 - d. Uniformity
98. All of the following are types of synthetic insecticides except:
- a. Nerve Poisons
 - b. Metabolic Inhibitors
 - c. Growth regulators
 - d. Botanicals
99. Targeting an insect pest during an instar stage for treatment may be a more successful method of control vs waiting till the insect matures into an adult.
- a. True
 - b. False
100. The three primary components of the turfgrass disease triangle include:
- a. Host, Pathogen, and Chance
 - b. Interaction, Pathogen, and Environment
 - c. Host, Pathway, and Environment
 - d. Host, Pathogen, and Environment

Please check to make sure you have filled out each bubble on the answer sheet and marked both your name and your chapter correctly. Nothing written on this test will be scored.



Conversions

WEIGHTS

1 kilogram (kg) = 1000 grams (g) = 2.2 pounds (lb.)

1 lb. = 16 oz. = 454.5 g

1 ton = 2,000 lbs.

1 gallon of water = 8.3 lbs.

LINEAR MEASURES

1 foot (ft.) = 12 inches (in.)

1 yard (yd.) = 3 ft. = 36 in.

1 meter (m) = 100 centimeters (cm.)

1 m = 1.09 yd. = 3.28 ft.

1 mile (mi.) = 5,280 ft.

1 kilometer (km.) = 1000 m. = 0.62 mi.

SQUARE MEASURES

1 ft² = 144 in²

1 yd² = 9 ft²

1 acre (ac.) = 43,560 ft² = 208.7ft. × 208.7ft.

1 hectare = 2.471 ac.

1 mile² = 640 ac.

“M” = 1000 ft²

CUBIC MEASURES

1 ft³ = 1,728 in³

1 yd³ = 27 ft³

1 m³ = 1.3 yd³ = 35.3 ft³



DRY AND LIQUID VOLUMES

1 gallon (gal.) = 128 fluid ounces (fl. oz.) = 4 quarts (qt.) = 8 pints

1 bushel = 32 qt. = 64 pints

1 gal. = 3.785 liters (L)

1 L = 1000 milliliters (mL) = 0.264 gal.

1 cm³ = 1 mL

1 gal. (water) = 231 in³ = 0.134ft³

1 ft³ (water) = 7.48 gal.

1 acre-foot = 1 foot of irrigation (depth) × ac. = 325 851.4 gal.

1 acre- inch = 1 inch of irrigation (depth) × ac. = 27, 154 gal.



Answer Key

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 - c. Festuca
 - d. Agrostis
56. What is meant by vernation?
- a. Appendages occurring in pairs at the base of the plant
 - b. Above ground membranous structure behind the stem
 - c. The way the leaf is formed within the bud
 - d. Veins that run along the midrib of the leaf
57. What characteristics do all bluegrasses have in common?
- a. Rolled vernation
 - b. Folded vernation
 - c. Large pointed ligule
 - d. Ridged abaxial surface
58. What effects does high levels of Nitrogen have on Shoot density
- a. Increase
 - b. Decrease
 - c. No effect
 - d. Not known
59. What effects does high levels of Nitrogen have on Root growth
- a. Increase
 - b. Decrease
 - c. No effect
60. Where is the bench height of a reel mower calculated from?
- a. Between the roller and the reel
 - b. Between the rake angle and the relief angle
 - c. Between the top angle and the bedknife
 - d. Between the roller and the bedknife



61. How many pounds of N are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 2.4
 - 3.5
 - 7
 - 14
62. How many pounds of P are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 0.2
 - 0.22
 - 0.5
 - 2.2
63. How many pounds of K are in a 50 lb bag of fertilizer with an analysis of 14-10-8?
- 1.72
 - 3.32
 - 3.44
 - 8
64. How much topdressing is needed to topdress 175,000 ft² of greens with a light (1/16 inch) topdressing?
- 34 cu.yds.
 - 102 cu.yds
 - 405 cu.yds
 - 911 cu. yds.
65. A 20-2-15 fertilizer is to be applied to the fairways at 0.75 lbs N/1000ft². There are 43 acres of fairways. How much fertilizer will be needed?
- 1405 lbs
 - 7024 lbs
 - 281 lbs
 - 4200 lbs
66. A 3 EC liquid insecticide has
- Has 3 lbs of active ingredient per gallon
 - Has 3 lbs of active ingredient per pound
 - Is 3 % active ingredient
 - All of the above
67. Creeping bentgrass is distinguished by the following features:
- stoloniferous growth, ridged adaxial leaf blades, and rolled vernation
 - stoloniferous growth, ridged abaxial leaf blades, and rolled vernation
 - stoloniferous growth, ridged adaxial leaf blades, and folded vernation
 - stoloniferous growth, ridged abaxial leaf blades, and folded vernation



68. Which warm-season turfgrass has the poorest shade adaptation?
- St. Augustinegrass
 - Zoysiagrass
 - Buffalograss
 - Bermudagrass**
69. Which of the following warm-season turfgrasses is the most cold hardy?
- zoysiagrass**
 - Seashore paspalum
 - common bermudagrass
 - hybrid bermudagrass
70. Of the following turfgrass species, which has the finest texture?
- rough bluegrass
 - tall fescue
 - red fescue**
 - perennial ryegrass
71. Which one of the following turfgrasses can be identified by its fringe of hairs located on the ligules and collars?
- Bentgrass
 - Bermudagrass
 - Bluegrass
 - Seashore paspalum**
72. Kentucky bluegrass differs from rough bluegrass by its:
- shorter ligule, glossy abaxial leaf and parallel-sided leaf blades**
 - longer ligule, glossy adaxial leaf and tapering leaf blades
 - shorter ligule, dull abaxial leaf and parallel-sided leaf blades
 - longer ligule, dull abaxial leaf and tapering leaf blades
73. Kentucky bluegrass is distinguished by the following features:
- stoloniferous growth, folded vernation, and smooth adaxial leaf blades
 - rhizomatous growth, folded vernation, and smooth adaxial leaf blades**
 - stoloniferous growth, rolled vernation, and smooth adaxial leaf blades
 - bunch-type growth, folded vernation, and ridged adaxial leaf blades
74. A _____ is an asexual reproductive structure that grows below the surface.
- Seed
 - Rhizome**
 - Stolon
 - Root
75. Seashore Paspalum is primarily known for its



- a. exuberant color
 - b. salt tolerance
 - c. fine texture
 - d. Auricles
76. What is the material of plant or animal remains at various stages of decay?
- a. Nitrogen
 - b. Clipping yield
 - c. Organic Matter
 - d. Endophytes
77. Original golf courses in the British Isles were laid out across _____ that became known as linksland.
- a. Pavement
 - b. Sand Dunes
 - c. Street Alleys
 - d. Forest Clearings
78. The golf hole cut into a green measures:
- a. 2.25"
 - b. 3.25"
 - c. 4.25"
 - d. 5.25"
79. Sand dunes and their slip faces occurred naturally in linksland areas as a result of wind-driven movement of sand particles. Modern golf courses recreate these areas which are known as _____.
- a. Gullies
 - b. Barrancas
 - c. Bunkers
 - d. Ravines
80. Golf courses use a great deal of inputs and take up space that could be used for housing or farming, but also provide a space for recreation and sequester _____, which is considered an ecosystem service.
- a. Carbon
 - b. Hydrogen
 - c. Nitrogen
 - d. Oxygen
81. Soil texture is defined by the size of the _____
- a. Particle
 - b. Atom
 - c. Bond
 - d. Climate



82. Organic matter or _____ builds up as bacteria break down plant matter and leave behind fats and waxes

- a. Humus
- b. Lime
- c. Phosphoric acid
- d. Silt

83. pH is a measure of H⁺ connections. A low pH would fall between

- a. 1-6
- b. 7
- c. 8-11
- d. 20-25

84. The phosphorus cycle is different than the Nitrogen cycle in that P can become immobilized or leech out/runoff of the local area through which if let to build up can cause _____ blooms

- a. Algal
- b. Sunflower
- c. Mushroom
- d. Clover

85. Much of the phosphorus that is applied on crops, including turfgrass, is lost.

- a. True
- b. False

86. When introducing more potassium into the soil, it often comes in the form of

- a. K₂O
- b. KOH
- c. P₂O₅
- d. N₂

87. Potassium can return to the soil when plant material is broken down by

- a. Decomposers
- b. Consumers
- c. Predators
- d. The Sun

88. Common fertilizers come in a package that includes Nitrogen, Phosphorus, and



- a. Potassium
 - b. Calcium
 - c. Manganese
 - d. Sodium
89. Growth in turfgrass occurs primarily at the _____ where the meristem tissue is located.
- a. Crown
 - b. Leaf tip
 - c. Seed
 - d. Seed coat
90. Turfgrass plants are dicots
- a. True
 - b. False
91. The products of photosynthesis include all the following except:
- a. CO₂
 - b. O₂
 - c. Glucose
 - d. H₂
92. Respiration uses O₂, Glucose, ATP, and NADPH to produce ATP
- a. True
 - b. False
93. Cool season grasses are C₃ plants, warm season grasses are C₄ plants
- a. True
 - b. False
94. The four primary factors for plant growth include:
- a. Light, temperature, moisture, and humidity
 - b. Shade, temperature, moisture, and humidity
 - c. Light, temperature, moisture, and disease
 - d. Light, temperature, nutrients, and humidity
95. Primary Benefits of turfgrass include all of the following except:
- a. All options are benefits
 - b. Erosion control
 - c. Traffic tolerance
 - d. Cooling effect
96. When talking about turfgrass characteristics, it is common to refer to turfgrass leaf width as
- a. Texture



- b. Density
 - c. Color
 - d. Uniformity
97. _____ refers to the number of shoots per defined area (typically an in²)
- a. Density
 - b. Texture
 - c. Color
 - d. Uniformity
98. All of the following are types of synthetic insecticides except:
- a. Nerve Poisons
 - b. Metabolic Inhibitors
 - c. Growth regulators
 - d. Botanicals
99. Targeting an insect pest during an instar stage for treatment may be a more successful method of control vs waiting till the insect matures into an adult.
- a. True
 - b. False
100. The three primary components of the turfgrass disease triangle include:
- a. Host, Pathogen, and Chance
 - b. Interaction, Pathogen, and Environment
 - c. Host, Pathway, and Environment
 - d. Host, Pathogen, and Environment

