

National FFA 2006 Agronomy Career Development Event  
Written Test  
50 Multiple Choice Questions  
Choose the Best Answer.

**I. Soil fertility and nutrient management**

1. Generally which nutrient deficiency causes tissues to turn purple?
  - a) phosphorus
  - b) iron
  - c) nitrogen
  - d) sulfur
  
2. Which of the following groups of essential elements are classified as primary?
  - a) N, K, and Ca
  - b) P, N, and K
  - c) Mg, Ca, and S
  - d) N, P, and S
  
3. A local farmer wants to apply a total of 200 pounds of nitrogen per acre on his corn field. He has spread 9 tons per acre of dry manure with an average analysis of 10 pounds of nitrogen per ton. How many additional pounds of nitrogen must he apply?
  - a) 100
  - b) 110
  - c) 283
  - d) None. He has applied enough already.
  
4. The smallest particle in soil is?
  - a) sand
  - b) silt
  - c) clay
  - d) loam
  
5. Which of the following would be a disadvantage for applying manure to a field?
  - a) increased organic matter
  - b) potential nitrogen runoff
  - c) added soil nutrients
  - d) all are advantages
  
6. Fertilizers are chemical compounds. The ratio of elements in a particular fertilizer (chemical) can be easily calculated by knowing the weight of the individual components. Given that the atomic weight of potassium is 39.1 (and you have 2 of these!) and oxygen is 16, what is the percentage of potassium in 200 pounds of  $K_2O$ ?
  - a) 55%
  - b) 45%
  - c) 39.1%
  - d) 83%



7. A soil is classified as "acidic" if it has a pH
- a) below 6.5
  - b) higher than 7.5
  - c) that is neutral
  - d) has no pH
8. Plant analysis
- a) is a very good substitute for a soil test
  - b) provides a tool to develop more efficient and economical fertilizer usage
  - c) should be correlated with soil sampling and field problems or situations
  - d) both b and c
9. The primary source of error from a soil test is
- a) laboratory analysis
  - b) field sampling technique
  - c) soil that is too wet
  - d) none of the above
10. A fertilizer is being advertised as an all purpose 13-13-13. What does the 13-13-13 indicate?
- a) very very very bad luck
  - b) 13 % nitrogen, 13% phosphorus 13% potassium
  - c) 13% urea, 13%  $P_2O_5$ , 13%  $K_2O$
  - d) both b and c

## **II. Plant physiology, morphology, and taxonomy**

11. Giberellins used as a plant growth regulator
- a) induce shoot cells and are used to thin fruit
  - b) intensify enzyme production and stimulate cell growth
  - c) prolong storage
  - d) induce stem shortening
12. What part of a plant cell contains non-nuclear DNA?
- a) mitochondria
  - b) nucleus
  - c) chloroplasts
  - d) cell wall
13. In soybean growth staging, which of the following refers to full bloom?
- a) R2
  - b) R8
  - c) VC
  - d) V4



14. As a rice, wheat, rye or other grain crop plant emerges through the soil surface the primary leaf or plumule is protected by the
- a) mesocotyl
  - b) coleoptile
  - c) rhizome
  - d) hypocotyls
15. The vascular tissue in a crop plant that conducts nutrients is the ...
- a) phloem
  - b) xylem
  - c) parenchyma
  - d) hypocomida
16. Peanut plants grow.....
- a) with pods forming from flowers above ground
  - b) with pods forming at the end of pegs below ground
  - c) with nodules forming on the roots that become nuts
  - d) with pods in the axils of branches and petioles
17. Which of the following is a warm season (C4) grass?
- a) orchardgrass
  - b) Kentucky bluegrass
  - c) Tall fescue
  - d) bermudagrass
18. Why do some forage plants not re-grow after they are cut?
- a) they are annuals
  - b) they are determinant
  - c) they are in-determinant
  - d) both a and b
19. The leaf blade of a grass plant is attached to a leaf sheath which in turn attaches to the stem of the plant at the
- a) auricles
  - b) ligules
  - c) node
  - d) stemata
20. Phototropism is caused by plant hormones that cause a plant to
- a) lean toward a light source
  - b) have downward growth of roots
  - c) have upward growth of stems
  - d) both b and c



### III. Pesticides

21. An example of a biological pesticide is
- a) an organophosphate
  - b) bacillus thuringensis
  - c) a carbamate
  - d) a pyrethroid
22. What are two insecticides that can inhibit the important enzyme cholinesterase, resulting in rapid twitching and paralysis?
- a) organophosphates and carbamates
  - b) chlorinated hydrocarbons and organophosphates
  - c) carbamates and chlorinated hydrocarbons
  - d) none of the above
23. Always read the label of a pesticide at least;
- a) 1 time
  - b) 2 times
  - c) 3 times
  - d) 4 times
24. A pesticide is most likely to pollute groundwater if it has which of the following characteristics?
- a) high volatility
  - b) high solubility
  - c) strongly adsorbed to soil colloids
  - d) rapidly degraded by soil organisms
25. The proper mixing order for pesticides is:
- a) wettable powders – dispersible granules – emulsifiable concentrates – surfactants
  - b) surfactants – liquid fertilizers – wettable powders – dispersible granules – emulsifiable concentrates
  - c) surfactants – liquid fertilizers
  - d) emulsifiable concentrates – dispersible granules – wettable powders – surfactants – surfactants
26. The weeds in your field are turning white. Which of the following herbicide types would most likely cause such injury?
- a) cell membrane disrupter
  - b) growth regulator
  - c) pigment inhibitor
  - d) amino acid inhibitor



27. You are applying Prowl 3.3EC at a rate of 2 pints per acre using 20 gallons of water per acre of application. You are traveling at 4.5 MPH. The field size is 1000 ft. X 1089 ft. The nozzles are 20 inches apart. How much herbicide and water will you need to treat the field?

- a) 6.25 gallons of Prowl and 500 gallons of water
- b) 50 gallons of Prowl and 500 gallons of water
- c) 10 gallons of Prowl and 200 gallons of water
- d) 500 gallons of Prowl and 20 gallons of water

28. Which of the following statements appears in some form on every pesticide label?

- a) Danger
- b) Keep out of reach of children
- c) Avoid eye contact
- d) Do not inhale dust

29. Soil herbicides that exhibit differential selectivity are generally based on what?

- a) placement
- b) differential metabolism
- c) physiological morphogenesis
- d) both A and B

30. If you wanted to make a banded herbicide application that would apply an equal amount of herbicide over the banded area, you would use which type of nozzle?

- a) hollow cone
- b) flood jet
- c) flat-fan EVS
- d) flat-fan

#### **IV. Weeds, insects and diseases**

31. The large phylum Arthropoda includes:

- a) insects and arachnids
- b) snakes and lizards
- c) fungus and mold
- d) none of the above

32. Sclerotinia is:

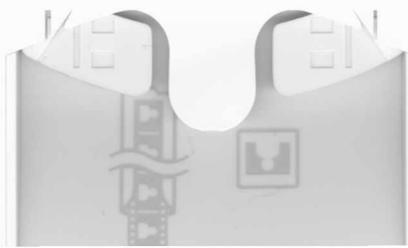
- a) insect
- b) a bacteria
- c) a virus
- d) a fungus

33. Pink bollworms damage cotton by;

- a) damaging the bolls
- b) feeding on the flowers
- c) feeding on the squares
- d) all of the above



34. Which of the following soybean disorders is caused by a microscopic pathogenic roundworm?
- a) phytophthora root rot
  - b) Soybean cyst nematode
  - c) sclerotinia mold
  - d) charcoal rot
35. Plant pathogens consist of four main groups. They are:
- a) fungi, weeds, bacteria and viruses
  - b) insects, weeds, fungi and bacteria
  - c) viruses, fungi, bacteria and nematodes
  - d) fungi, insects, bacteria and viruses
36. Which of the following insects is necessary for pollinating cucumbers, squash, watermelon and cantaloupe?
- a) Japanese beetle
  - b) Lady beetle
  - c) Grasshopper
  - d) None of the above
37. Which of the following insects is best described as a beetle with copper colored wings and a jade green head?
- a) armyworm
  - b) bean leaf beetle
  - c) lady beetle
  - c) Japanese beetle
38. Which of the following weeds contain compounds (alkaloids) that are toxic to animals?
- a) redroot pigweed
  - b) common lambsquarter
  - c) jimson weed
  - d) onion
39. Which of the following pathogens would cause a mottled or mosaic effect in leaf tissue?
- a) fungi
  - b) bacteria
  - c) virus
  - d) nematode
40. Tomato spotted wilt virus (TSWV) affects which of the following crops?
- a) tomatoes
  - b) peppers
  - c) peanuts
  - d) all of the above



V. General crop management including conservation practices

41. Your tomatoes are planted in 30 inch rows. In 17 ft. 5 in. of row length you count 21 plants. What is your estimated plant population per acre?

- a) 21,000
- b) 25,400
- c) 16,000
- d) 17,500

42. Earliest planting date for a crop species is determined by . . .

- a) calendar date
- b) crop variety
- c) soil temperature
- d) soil moisture

43. What is the main purpose for flooding rice during production?

- a) improved soil aeration
- b) weed control
- c) increased nitrogen uptake
- d) none of the above

44. A friend wants to plant his 125 acre corn field with a population of 32,000 plants per acre. The seed he will purchase has 80,000 kernels per bag. The germination rate is 99%. How many bags of seed does he need to purchase?

- a) 51 bags
- b) 48 bags
- c) 94 bags
- d) 120 bags

45. An accurate estimate of a plant population per acre can be obtained by counting the number of plants in a length of row equal to one-thousandth (1/1000) of an acre. How many feet equals one-thousandth of an acre based on 30 inch row spacing?

- a) 17 feet 5 inches
- b) 18 feet 2 inches
- c) 16 feet 4 inches
- d) 20 feet

46. Which of the following is the highest acceptable moisture content for long term storage of corn for grain?

- a) 20.2%
- b) 18.8%
- c) 12.3%
- d) 15.5%



47. You are purchasing hay and have a choice between two lots of alfalfa hay that are equivalent in quality and both are selling for \$150 per ton. There is only one difference, lot A is 10% moisture and lot B is 15% moisture. What is the actual price per ton of dry matter for each lot of hay? Round to the nearest dollar.

- a) A = \$167 and B = \$176
- b) A = \$140 and B = \$135
- c) A = \$135 and B = \$128
- d) There is no difference

48. You have a bunker silo that will hold 400 tons of wet corn silage packed at an average density. If you anticipate corn silage yields of 5 tons per acre of dry matter (harvested at 35% dry matter) how many acres of corn will you need to plant in order to fill your bunker silo at harvest (round to the nearest whole number).

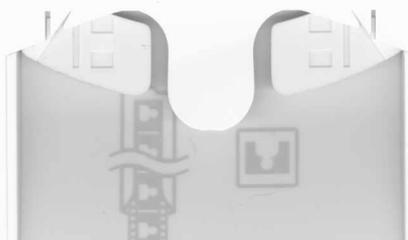
- a) 28 acres
- b) 35 acres
- c) 42 acres
- d) 24 acres

49. You have planted 100 acres of winter wheat and you realize that the price of cattle is pretty good and the price of wheat is uncertain. So, you decide to contract to graze some stocker cattle on your wheat. You can graze these cattle for approximately 42 days from about mid-February until April 1<sup>st</sup> (you need to remove the cattle by first hollow stem since you want to retain the option of a grain harvest). You estimate that you can safely remove 1500 lbs/acre of forage (on a dry basis) over the 42 day period (about 35 lbs per acre per day). Animals are expected to gain 2 lbs per day. Average animal forage intake is 3% of body weight per day (dry forage) how many 500 lb steers should you contract?

- a) 233
- b) 1111
- c) 105
- d) 200

50. You have planted your corn along the river in a field that is very heavy clay. Right after planting you received a heavy rain and the soil crusted badly. You are worried about your corn being able to emerge through this hard crust. What can you do about this situation?

- a) nothing, just pray for more rain to soften the ground
- b) borrow your neighbors rotary hoe (and use it on this field)
- c) cultivate between the row to break up as much crust as possible
- d) replant as soon as possible



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KEY

- |     |   |     |   |
|-----|---|-----|---|
| 1.  | A | 26. | C |
| 2.  | B | 27. | A |
| 3.  | B | 28. | B |
| 4.  | C | 29. | B |
| 5.  | B | 30. | C |
| 6.  | D | 31. | A |
| 7.  | A | 32. | D |
| 8.  | D | 33. | D |
| 9.  | B | 34. | B |
| 10. | B | 35. | C |
| 11. | B | 36. | D |
| 12. | A | 37. | D |
| 13. | A | 38. | C |
| 14. | D | 39. | C |
| 15. | A | 40. | D |
| 16. | B | 41. | A |
| 17. | D | 42. | C |
| 18. | A | 43. | B |
| 19. | C | 44. | A |
| 20. | A | 45. | A |
| 21. | B | 46. | D |
| 22. | A | 47. | A |
| 23. | D | 48. | A |
| 24. | B | 49. | D |
| 25. | A | 50. | B |

