



Agronomy Career Development Event

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50 Question Multiple Choice - Choose the best answer.

WRITTEN EXAM – NUTRIENT MANAGEMENT

1. pH is the measurement of the concentration of what ion in the soil?
 - A. hydroxide
 - B. hydrogen
 - C. phosphorus
 - D. helium

2. Soil samples for distinctly different areas of the field should be (i.e. different soil types or hill tops vs. bottom lands):
 - A. analyzed separately
 - B. mixed together to represent a single production unit
 - C. ignored as being meaningless
 - D. mixed together for large fields and kept separate for small fields

3. What is the conversion of ammonium to nitrate known as?
 - A. ammonification
 - B. denitrification
 - C. mineralization
 - D. nitrification

4. When do broadcast applications of dry fertilizer become plant available?
 - A. when crop residues are decomposed
 - B. after irrigation or rainfall dissolves the fertilizer and moves into the root zone
 - C. when is tilled 6 to 8 inches into the soil with a tillage tool
 - D. when soil temperatures rise above 70 degrees Fahrenheit

5. What are national regulatory agencies regulating manure applications most concerned about?
 - A. excessive phosphorus
 - B. phosphorus deficiency
 - C. excessive potassium
 - D. potassium deficiency

6. When thinking of crop nutrient fertilization, what does agronomic rate of application mean?
- A. applying a balanced amount of nutrients
 - B. matching fertilizer inputs with crop requirements under given soil conditions
 - C. applying both a broadcast and starter fertilizer along with a side-dress treatment
 - D. applying only a broadcast and starter fertilizer
7. What do the 4R's of fertilizer application refer to?
- A. The Right price, Right brand, Right rate, Right place
 - B. The Right source, Right rate, Right price, Right form
 - C. The Right source, Right rate, Right time, Right place
 - D. The Right price, Right rate, Right form, Right analysis
8. What is the key benefit to banding phosphorus fertilizers?
- A. less phosphate leaching
 - B. a concentrated alkaline zone
 - C. less tie up in the soil leading to better plant availability
 - D. required for higher fertilizer rates
9. Visual symptoms of zinc deficiency usually appear as:
- A. chlorosis
 - B. twisted stems
 - C. pale foliage on older leaves first
 - D. stem pitting
10. _____ is adsorbed as a cation and is part of the chlorophyll molecule.
- A. Na^+
 - B. H^+
 - C. Ca^{+2}
 - D. Mg^{+2}

WRITTEN EXAM – PEST MANAGEMENT

11. Select the condition that could help reduce pesticide volatilization.
- A. high air temperatures
 - B. low relative humidity
 - C. incorporation
 - D. small droplets

12. A weed is described as?
- A. **a plant that is not valued where it is growing**
 - B. a fast-growing plant
 - C. a plant that lives for more than one year
 - D. a plant growing from a seed
13. What type of flowering plant takes 12-24 months to complete its life cycle? It grows vegetative the first year and then reproduces the second year.
- A. annual plant
 - B. **biennial plant**
 - C. triennial plant
 - D. perennial plant
14. Epinasty in plants is described as:
- A. **the twisting and bending of plant leaves and stems due to an auxin**
 - B. the discoloration of leaves caused by a toxin
 - C. interveinal yellowing of leaves caused by a nutrient deficiency
 - D. spotting of leaves from a contact herbicide
15. Which type of insecticide moves throughout the plant?
- A. photosynthetic
 - B. **systemic**
 - C. contact
 - D. juvenile
16. Plant diseases occur when the following occur at the same time:
- A. **a susceptible plant, a virulent pathogen, and a favorable environment**
 - B. a susceptible plant, a virulent pathogen and insect pests
 - C. a virulent pathogen, an environment favorable for disease and insect pests
 - D. a susceptible plant, insect pests, and freezing temperatures
17. Spray drift is the least when which of the following conditions exist?
- A. droplet size increases, wind speed increases
 - B. droplet size decreases, wind speed decreases
 - C. droplet size decreases, wind speed increases
 - D. **droplet size increases, wind speed decreases**

18. What does IPM stand for?
- A. Intensive Pesticide Management
 - B. Intensive Personnel Management
 - C. **Integrated Pest Management**
 - D. Intensive Pest Manipulation
19. Which of these is an example of biological aphid control?
- A. using an insect growth regulator
 - B. **introduction and protection of natural predators**
 - C. destroying all-natural predators
 - D. setting and maintaining traps
20. After a herbicide drifts onto a plant, only small spots on the plant leaves and stem are dead. The herbicide that drifted was most likely what type of herbicide?
- A. **contact**
 - B. systemic
 - C. adsorptive
 - D. generic

WRITTEN EXAM – SOIL AND WATER MANAGEMENT

21. How does soil texture influence the development of soil compaction?
- A. **Clay soils are more likely to suffer compaction than are sandy soils.**
 - B. Sandy soils are quite subject to compaction when dry.
 - C. It is basically impossible to compact a silt loam.
 - D. The amount of water present is far more important than its textural class.
22. A sodic soil is characterized by having a disproportionally high concentration of what exchangeable cation in the Cation Exchange Capacity (CEC) complex?
- A. calcium
 - B. chloride
 - C. magnesium
 - D. **sodium**

23. The point at which soil holds moisture so tightly that plants cannot extract it is called?
- A. **the permanent wilting point**
 - B. the drought point
 - C. field capacity
 - D. the transient wilting point
24. Compaction is the reduction of:
- A. soil CEC
 - B. soil weight
 - C. **soil pore space**
 - D. soil density
25. What is a horizontal layer of soil, created by soil forming processes, that differ in physical or chemical properties from adjacent layers called?
- A. hardpan
 - B. **soil horizon**
 - C. fragipan
 - D. tillage pan
26. What soil contains significant amounts of naturally occurring calcium carbonate? These soils are characterized by a high soil pH and fizz when a dilute acid is applied.
- A. **calcareous soil**
 - B. mineral soil
 - C. volcanic soil
 - D. organic soil
27. _____ is an eroded material deposited by running water including gravel, sand, silt, and clay.
- A. Bedrock
 - B. Glacial till
 - C. A loess deposit
 - D. **An alluvial deposit**

28. What causes clay soils to often drain slower than loam soils following heavy rain or irrigation?
- A. clay soils have more sodium
 - B. clay soils have smaller diameter pores**
 - C. loam soils have less total pore space
 - D. clay soils often have less organic matter
29. Nutrient leaching is most likely to occur in what soil type?
- A. silty clay soil
 - B. clay soil
 - C. compacted soil
 - D. sandy soil**
30. 70-80% of soil compaction severity occurs with the _____ tire pass although the depth of the compaction is determined by the _____ axle load.
- A. first, lightest
 - B. first, heaviest**
 - C. last, lightest
 - D. last, heaviest

WRITTEN EXAM – CROP MANAGEMENT

31. Which system uses a constellation of orbiting satellites to identify a location on Earth based on longitude and latitude coordinates along with altitude?
- A. Geographic Directional Coordinates (GDC)
 - B. Variable Rate Technology (VRT)
 - C. Geographic Information System (GIS)**
 - D. National Air and Space Association (NASA)
32. Growing two or more crops together in the same field at the same time is known as?
- A. intercropping**
 - B. strip till
 - C. continuous cropping
 - D. double crop

33. At which stage of growth should plant tissue samples should be taken?
- A. sufficiently in advance of fertilization to allow time for analysis and return of results from the lab
 - B. any time before bloom
 - C. early season shortly after emergence
 - D. **the stage that corresponds to those used to develop interpretive guidelines**
34. What is the name of the group of nitrogen-fixing bacteria in legume nodules?
- A. nitrosomonas bacteria
 - B. nonsymbiotic bacteria
 - C. rhizome bacteria
 - D. **rhizobium bacteria**
35. In small grain production, jointing refers to which of the following?
- A. tiller production
 - B. the head is in the boot
 - C. **the first node is visible above the soil surface**
 - D. the flag leaf has emerged
36. Which of the following definitions best describes a petiole?
- A. the surface of the leaf
 - B. **the small stem attached to the leaf**
 - C. the vein structure in the leaf
 - D. the edge of the leaf
37. What is the growth of a plant toward any stimulus is called?
- A. **tropism**
 - B. hormones
 - C. receptors
 - D. vernalization

38. Name the condition in which stalks or stems break or fall over above the soil surface because of weak stalks, weak roots, damage, or weather events.
- A. germination
 - B. **lodging**
 - C. maturation
 - D. emergence
39. A _____ plant has a fibrous root system and parallel venation.
- A. annual
 - B. biennial
 - C. dicot
 - D. **monocot**
40. What is the pigment associated with sugar metabolism, when it accumulates in the plant, it gives the plant a reddish/purple color?
- A. chlorophyll
 - B. carotenoid
 - C. **anthocyanin**
 - D. xanthophyll

WRITTEN EXAM – CALCULATIONS

41. A fertilizer spreader has an effective application width of 37.5 feet. If 21.6 pounds of fertilizer is collected from the spreader in 60 seconds. When traveling 6.8 mph, what is the rate of fertilizer that is being applied per acre with this spreader?
- A. 3.2
 - B. 11.1
 - C. **41.9**
 - D. 54.5
42. Approach Prima Fungicide is used at the rate of 6.8 fl oz/ac on soybean for the control of Frog Eye and Brown Spot. How many acres will a 2.5-gal jug treat?
- A. 5.9 acres
 - B. 11.8 acres
 - C. 23.6 acres
 - D. **47.1 acres**

43. A wheat farmer is budgeting expenses for his coming growing season as this time he projects his total expenses to be \$412.80 per acre. His average wheat yield is 80 bu/ac. What is his breakeven price per bushel?
- A. **\$5.16**
 - B. \$5.29
 - C. \$6.49
 - D. \$7.74
44. Current university research shows a soybean yield response to the application of 20 pounds of sulfur preplant. How much 21-0-0-24 per acre do you need to spread?
- A. 4.2 pounds/ac
 - B. 4.8 pounds/ac
 - C. **83.3 pounds/ac**
 - D. 93.3 pounds/ac
45. UAN fertilizer at 28% nitrogen costs \$226.50 per ton. The liquid fertilizer weighs 10.67 pounds per gallon. What is the per pound cost for the nitrogen?
- A. \$0.37/pound
 - B. **\$0.40/pound**
 - C. \$0.55/pound
 - D. \$0.63/pound

Using the following information answer the next five questions (46-50).

Traci is making plans to seed her field to winter six-row malting barley on her farm in Maryland. The field is capable of producing 135 bu/acre under irrigation. The field has a center pivot irrigation system with eight 156 ft spans and an end gun that effectively reaches 50 ft. Traci will plant in concentric circles under the pivot and leave the dry corners fallow. She is targeting 1.25 million plants per acre, the seed she had purchased has 13,500 seeds per pound and 92% germination. Barely weighs 48 pounds per bushel. Total nitrogen for the crop will be 1.2 pounds of nitrogen per bushel of grain. She plans on applying 30 pounds of nitrogen broadcast preplant and the remainder in two spring (top-dress) applications. Soil tests were used to make fertilizer recommendations, the recommendations call for 83.7 pounds of P_2O_5 and 47.3 lbs/ac K_2O to be broadcast preplant.

46. What is the area of Traci's field?
- A. .19 acre
 - B. 112.3 acres
 - C. **121.4 acres**
 - D. 485.8 acres

47. What will the total nitrogen program per acre be?
- A. 132 pounds of N per acre
 - B. **162 pounds of N per acre**
 - C. 178 pounds of N per acre
 - D. 192 pounds of N per acre
48. What is Traci's target seeding rate?
- A. 85.2 pounds per acre
 - B. 92.6 pounds per acre
 - C. **100.6 pounds per acre**
 - D. 112.3 pounds per acre
49. How much 0-0-60 will Traci need to apply preplant?
- A. **78.8 pounds per acre**
 - B. 83.7 pounds per acre
 - C. 111.1 pounds per are
 - D. 139.5 pounds per acre
50. If Traci uses UAN 28-0-0 for her spring nitrogen applications, how many total gallons of UAN per acre will she need for her split spring top-dress applications? (1 gal UAN weighs 10.67 pounds)
- A. 10.0 gallons/ac
 - B. 17.2 gallons/ac
 - C. 23.8 gallons/ac
 - D. **44.2 gallons/ac**