

**2016 AGRONOMY KANSAS FFA CDE
AGRONOMIC QUIZ**

Contestant No. _____ Contestant Name _____ **KEY** _____ Score _____

WRITE ANSWERS ON BLANKS USING CAPITAL LETTERS – (4 points each)

- B_____ 1. Cheat and downy brome are problem weeds in wheat in Kansas because, like wheat, they are classified as:
A) perennial grasses
B) winter annual grasses
C) summer annual grasses
D) summer annual dicots
E) winter annual dicots
- B_____ 2. Which of the following is a common dry fertilizer carrier that supplies both nitrogen and phosphorus with a typical analysis of 18-46-0?
A) triple super phosphate (TSP)
B) di-ammonium phosphate (DAP)
C) mono-ammonium phosphate (MAP)
D) ammonium polyphosphate (APP)
E) urea-ammonium nitrate (UAN)
- D_____ 3. Broadcast application of UAN liquid nitrogen fertilizer to a growing crop of wheat in late February is called:
A) banding B) sidedressing C) fertigating D) topdressing E) incorporating
- D_____ 4. Growing two crops in sequence (one after the other) in the same field in the same year is called:
A) cover cropping
B) strip cropping
C) intercropping
D) double cropping
E) fallowing
- B_____ 5. How many seeds are in a bag of most commercial corn seed sold in the United States?
A) 50,000 B) 80,000 C) 100,000 D) 140,000
E) none of the above, they are a standard weight and it varies depending upon the seed size
- D_____ 6. A harvest concern with regard to wheat seed infected with head scab disease that was especially prevalent in 2015 in Kansas is the potential presence of toxic levels of:
A) nitrate B) *Salmonella* C) aflatoxin D) vomitoxin E) *E. coli*
- B_____ 7. One variation of conservation tillage for row crops is to just till the soil in narrow paths, then plant seeds into these narrow tilled paths (now possible with auto steer and precision planting technology). This practice is called:
A) vertical tillage B) strip tillage C) ridge tillage D) strip intercropping E) fallowing

- D_____ 8. Which crop is used to make linseed oil from its seed and linen fabric from its stems?
A) safflower B) sunflower C) canola D) flax E) cotton
- D_____ 9. Which of the following common acronyms is **NOT associated** with evaluation of forage quality?
A) CP (crude protein)
B) ADF (acid detergent fiber)
C) NDF (neutral detergent fiber)
D) ATP (adenosine triphosphate)
E) TDN (total digestible nutrients)f
- C_____ 10. European corn borers cause damage to corn by:
A) feeding on the roots during the larval stage
B) feeding on the roots during the adult stage
C) feeding in the stalks during the larval stage
D) feeding in the stalks during the adult stage
E) feeding on the roots during the larval stage and feeding in the stalks during the adult stage
- A_____ 11. Which of the following tillage tools would be used to control small weeds and break up the soil crust in a recently planted field where seedlings are just trying to emerge?
A) rotary hoe B) tandem disk C) moldboard plow D) ripper E) field cultivator
- D_____ 12. A disease of winter wheat called streak mosaic is caused by a virus. It is transferred from one plant to another by the wheat curl mite. The disease carries over from summer after wheat harvest until the fall by living within volunteer wheat plants which the mites feed on. The mites are then blown by the wind from the volunteer plants to newly planted wheat to spread the disease. Getting rid of volunteer plants before planting the next crop helps control it. In this disease scenario, which of the following is considered the “vector” of the disease?
A) the virus pathogen
B) the volunteer wheat plants
C) the wind
D) the wheat curl mite
E) all of the above are “vectors” since they all need to be present for the disease to occur
- C_____ 13. Using the growing degree day (GDD) model used to predict U.S. hybrid corn maturity with a base temperature of 50° F, if a day has a high temperature of 85° F and a low temperature of 65° F, the number of GDDs accumulated for that day is:
A) 75 B) 35 C) 25 D) 20 E) 15
- C_____ 14. Herbicides like "Cobra" or "Gramoxone" that act only on the surface of weeds where they are applied and are not translocated throughout the plant are called:
A) selective B) non-selective C) contact D) systemic E) residual
- C_____ 15. Which of the following terms or acronyms found on a pesticide label defines the type of gloves, clothing, goggles, etc.) must be worn by the applicator?
A) EPA number B) REI C) PPE D) LD₅₀ E) signal word

- D_____16. Syngenta corn hybrids are marketed under the Agrisure[®] product name with the genetically engineered traits coded by abbreviations (ie. Agrisure[®] GT/RW, Agrisure[®] CB/LL/RW). Which of these abbreviations indicates the presence of a trait for glufosinate herbicide tolerance (this herbicide is most commonly marketed under the trade name Liberty[®]).
- A) GT B) RW C) CB D) LL
E) none of the above, these abbreviations have nothing to do with herbicide tolerance
- D_____17. A new transgenic trait for soybeans has been developed by Dow AgroSciences that will be marketed under the trade name “Enlist” when released. This trait makes these crops:
- A) more drought tolerant
B) resistant to most major fungal diseases
C) tolerant to the growth regulator herbicide dicamba
D) tolerant to the growth regulator herbicide 2,4-D
E) resistant to mites and nematodes, an important development since these two pests are different from insects and do not have as many chemical control options available
- A_____18. Conversion of soil nitrate to nitrogen gases that can then be lost from the soil, which is most likely on waterlogged or poorly drained soils, is called:
- A) denitrification B) immobilization C) nitrogen fixation D) leaching
E) none of the above, soil nitrate cannot be converted to gaseous forms
- C_____19. Sprinkler irrigation systems have an advantage over furrow or flood irrigation systems for all of the following **except**:
- A) more uniform application of water with sprinkler
B) lower labor costs with sprinkler
C) less energy required to pump and distribute water with sprinkler
D) less land leveling needed with sprinkler
E) less leaching losses with sprinkler
- E_____20. Which of the following conditions would **not likely** be a result of using a no-till system that leaves crop residue on the soil surface versus incorporating the residue with tillage?
- A) more water infiltration
B) cooler soil temperature
C) less soil moisture loss by evaporation
D) less wind and water erosion
E) less overwintering of insect and disease pests
- C_____21. Which of the following statements related to managing soil texture is **not true**?
- A) timeliness of tillage is more critical for clay soils than for sandy soils
B) soil applied herbicides must usually be applied at higher rates on clay soils than sandy soils
C) it takes more lime to change the pH of sandy soils compared to clay soils
D) clay soils can hold more water and nutrients than sandy soils
E) split application of nitrogen fertilizer is more critical on sandy soils than on clay soils since sandy soils are more likely to have leaching loss of nitrogen
- D_____22. The natural toxin in cotton that can have a negative effect on health of animals fed too much whole cotton seed or cotton seed by-products is called:
- A) prussic acid B) nitrate C) cellulose D) gossypol E) aflatoxin

- D_____23. A crop consultant finds a lot of aphid “mummies” when scouting for corn leaf aphids. These aphid mummies are evidence of biological control by:
- A) lady bugs B) predator mites C) lace wings D) parasitic wasps E) Bt bacteria
- B_____24. A precision agriculture tool that allows a sprayer to turn off some nozzles when it recognizes from GPS coordinates that the area it is passing over has already been sprayed is called:
- A) row control B) boom control C) autosteer D) NDVI imaging E) weed seeker
- E_____25. Areas of land maintained in permanent grass and strategically placed along streams or drainage areas to help control erosion and filter out sediment and contaminants from crop fields are called:
- A) critical zones B) wetlands C) recharge areas D) ecosystems E) buffer strips
- C_____26. Which of the following is **NOT one** of the “Four R’s” that should be considered in responsible nutrient stewardship when making any fertilizer application:
- A) right rate (how much is needed – based on soil test, nutrient removal by prior crop, etc.)
B) right source (what fertilizer carrier should be used – analysis, solid, liquid, gas, etc.)
C) right company (who should it be purchased from – brand name, salesperson, cost, etc.)
D) right time (when should it be applied – preplant, starter with seed, split application, etc.)
E) right place (where should it be placed – broadcast, banded, topdress, etc.)
- C_____27. There is considerable controversy recently over the use of neonicotinoid insecticides such as imidacloprid, clothianidin, and thiamethoxam common in seed treatments and their potential environmental impact. The primary concern is the idea that these insecticides may be:
- A) leaching into groundwater
B) running off into streams
C) contributing to the decline in bee populations
D) contributing to the decline in the lesser prairie chicken
E) volatilizing to produce greenhouse gasses
- B_____28. Phosphorus from fertilizer or manure is most likely to be lost from crop fields, and thus may harm the environment, by:
- A) leaching into groundwater (contaminating wells used for drinking water)
B) runoff into surface water (contributing to eutrophication of lakes and streams)
C) volatilization into the atmosphere as a “greenhouse gas” (contributing to climate change)
D) all of the above are common ways phosphorus is lost from soils
E) none of the above, phosphorus is very seldom lost from soils since it does not move readily
- B_____29. A horizontal, creeping stem growing above the soil surface that produces new shoots and roots at the nodes, such as found in buffalograss and white clover, is called a:
- A) rhizome B) stolon C) tuber D) bulb E) hypocotyl
- D_____30. The wheat diseases leaf rust, wheat scab and loose smut are all caused by:
- A) viruses B) bacteria C) nematodes D) fungi E) adjuvants

AGRONOMIC CALCULATIONS

Each question is worth 3 points. To receive full credit, place answer in the box with appropriate units. Round to one decimal place unless otherwise indicated.

Useful conversions: 43,560 ft²/acre, 2,000 pounds/ton, 12 inches/foot, 5280 ft/mile, 3785 ml/gallon, 16 dry ounces/pound, 128 fluid ounces/gallon

31. An alfalfa seed tag reads purity 90% and germination 80%.

What is the percent Pure Live Seed (% PLS)?

72% PLS

32. Urea fertilizer with an analysis of 46-0-0 costs \$414 per ton.

What is the cost per pound of nitrogen (N)?

\$ 0.45/lb N

33. A rancher harvests 5 tons dry matter per acre of sudangrass hay. The sudangrass hay averages 9% protein and protein averages 16% nitrogen.

Calculate the pounds of nitrogen removed per acre in the hay.

144 lb N/acre

34. Your soil test recommends 3000 pounds ECCE lime per acre. You have agricultural lime available with a 75% ECCE analysis.

How many tons of this lime are needed for your 80 acre field?

160 tons lime/field

35. When determining plant stands you count an average of 69 soybean plants in 20 foot sections of row. Row width is 15 inches.

What is the population in plants per acre?

120,225 plants/acre

36. You are calibrating a sprayer and you collect 473 ml of water in 30 seconds from an individual nozzle. Nozzle spacing is 20 inches and the speed of travel is 6 miles per hour.

What is the sprayer application rate in gallons per acre (round to two decimal places)?
(you may use the shortcut formula)

$$\text{GPA} = \frac{5940 \times \text{GPM}}{\text{MPH} \times \text{Nozzle Spacing in Inches}}$$

12.37 gal/acre

37. A spray tank has a volume of 500 gallons. It is calibrated to spray at 20 gallons per acre. You need to add Weed-Out herbicide which is a dry flowable (DF) formulation at the recommended rate of 6 oz of product per acre.

How many pounds of Weed-Out do you need to add to the tank?

9.4 lb Weed-Out/tank

38. A farmer delivers a truckload of wheat to the elevator that weighs 29,100 pounds. The measured test weight is 58.2 pounds per bushel (no dock). The farmer sells the wheat for the current posted price of \$4.50 per bushel.

What is the total amount that the elevator pays the farmer?

\$ 2182.50

39. Your soil test recommends 150 pounds N per acre and 75 pounds P_2O_5 per acre for corn. Fertilizers available are UAN (32-0-0) and APP (10-34-0).

How many total pounds of UAN is needed per acre? (be sure to account for the N applied with the APP)

400 lb UAN/acre

40. You wish to apply 1 inch of water to your field which is under a center pivot irrigation system on a quarter section in western Kansas. Your well capacity is 700 gallons per minute. There are 27,154 gallons per acre-inch.

How many hours will it take to complete a full circle and apply the 1 inch of water to the field? (a quarter section center pivot covers 125 acres)

80.8 hours/field