

**2011 AGRONOMY KANSAS FFA CDE
AGRONOMIC QUIZ**

Contestant No. _____ Contestant Name KEY _____ Score _____

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

- C 1. For which of the following Kansas crops might farmers grow either oilseed or confectionary type varieties?
A) soybean B) wheat C) sunflower D) corn E) canola
- E 2. Which of the following crops is used to produce a common food oil and a high protein meal (44-48% protein) commonly used for livestock feed rations?
A) alfalfa B) corn C) wheat D) grain sorghum E) soybean
- A 3. Prussic acid poisoning is a potential problem for livestock grazing which of the following forage crops?
A) sorghums B) alfalfa C) fescue D) winter wheat E) native range (prairie)
- C 4. The standard test weight per bushel for corn is:
A) 48 pounds B) 52 pounds C) 56 pounds D) 60 pounds E) 100 pounds
- D 5. A harvest concern with regard to wheat seed infected with scab disease is the potential presence of toxic levels of:
A) nitrate B) *Salmonella* C) aflatoxin D) vomitoxin E) *E. coli*
- E 6. A crop planted to protect the soil from erosion, add nitrogen to the soil (if a legume is used), and “trap” nutrients to reduce losses during the time between two crop seasons is called a:
A) fallow crop B) intercrop C) pulse crop D) companion crop E) cover crop
- D 7. The greatest yield reduction due to drought stress in grain sorghum generally results when the stress occurs during the:
A) seedling emergence stage resulting in poor stands
B) vegetative stage resulting in less tillering
C) growing point differentiation stage resulting in fewer heads initiated
D) boot stage resulting in poor head emergence
E) grain filling stage resulting in low test weight grain
- C 8. Application of liquid nitrogen solution fertilizer by mixing it into the irrigation water is called:
A) banding B) sidedress C) fertigation D) topdress E) incorporation

- D 9. The top crop in Kansas in 2010 in total acres harvested was _____, while the top crop in total bushels produced and total value of production was _____.
- A) corn; wheat
 - B) wheat; soybeans
 - C) corn; soybeans
 - D) wheat; corn
 - E) wheat; grain sorghum
- E 10. Corn rootworms 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 on the silks during the adult stage
 - D) feeding on the roots during both the larval stage and the adult stage
 - E) feeding on the roots during the larval stage and feeding on the silks during the adult stage
- C 11. The phrase “dusting it in” when used in wheat production refers to:
- A. planting the seed very deep into a layer of soil moisture to get below a dry surface layer
 - B. planting the seed at recommended depth into a loose, well-tilled soil with good moisture
 - C. planting the seed shallow into a dry soil surface hoping for a rain so it can germinate later
 - D. planting the seed at recommended depth with a no-till drill which cuts through the residue left from a previous crop to get good seed-to-soil contact
 - E. none of the above, “dusting it in” has nothing to do with planting wheat seed
- D 12. Fescue toxicity (also known as “fescue foot”) in livestock grazing tall fescue is caused by:
- A) prussic acid B) nitrate C) nematodes D) endophyte fungus E) magnesium deficiency
- C 13. Application of one acre-inch of irrigation water requires approximately how much water?
- A) 7,000 gal B) 17,000 gal C) 27,000 gal D) 43,000 gal E) 100,000 gal
- E 14. Sprinkler irrigation systems have an advantage over furrow irrigation systems for all of the following **except**:
- A) more uniform application of water with sprinkler
 - B) less leaching losses with sprinkler
 - C) lower labor costs with sprinkler
 - D) less land leveling needed with sprinkler
 - E) less energy required to pump and distribute water with sprinkler
- C 15. 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) less evaporation
 - C) warmer soil temperature
 - D) less wind erosion
 - E) less water erosion
- A 16. The name of the bacteria responsible for nitrogen fixation in legumes and contained in the inoculum added to legume seeds at planting is:

A) *Rhizobium* B) *Bacillus thuringiensis* C) *E. coli* D) *Phytophthora* E) *Lactic*

C 17. Grain sorghum seed treated with “Concep III” would provide:

- A) a fungicide to prevent seedling diseases
- B) an insecticide to prevent wireworm damage in the soil
- C) a safener chemical to allow use of chloroacetamide herbicides (ie. Dual, Bicep)
- D) nitrogen fixing bacteria inoculum to insure nitrogen fixation
- E) this seed treatment would provide for all of the above

B 18. Which of the following terms or acronyms found on a pesticide label defines the time that workers must not enter the field after the pesticide has been applied?

- A) EPA number B) REI C) PPE D) active ingredient E) signal word

D 19. Crops genetically engineered for resistance to glyphosate herbicide would be indicated by the patented trade name:

- A) Liberty Link[®] B) Clearfield[®] C) YieldGard[®] D) Roundup Ready[®] E) Bt[®]

B 20. Farmers planting transgenic GMO corn with Bt insect resistance must plant a portion of their corn fields (typically 20%) to non-GMO hybrids to help slow the development of insect resistance. This portion of the field planted to the non-GMO hybrid is called the:

- A) residual B) refuge C) residue D) cover crop E) conservation reserve

A 21. “Roundup Ready” varieties of this forage crop have recently been deregulated and it can now be planted again - a lawsuit led to its withdrawal after it had already been released several years ago. The crop is:

- A) alfalfa B) sudangrass C) tall fescue D) silage corn E) wheat

B 22. Cheat, downy brome, and jointed goatgrass are all problem weeds in wheat in Kansas that are classified as:

- A) perennial grasses
- B) winter annual grasses
- C) summer annual grasses
- D) summer annual broadleaves
- E) winter annual broadleaves

A 23. Which of the following is the most common dry nitrogen fertilizer carrier with an analysis of 46-0-0?

- A) urea
- B) urea-ammonium nitrate (UAN)
- C) anhydrous ammonia
- D) diammonium phosphate (DAP)
- E) ammonium polyphosphate

D 24. The wheat diseases leaf rust, stem rust, and stripe rust are all caused by:

- A) nematodes B) bacteria C) viruses D) fungi E) adjuvants

- D 25. A common disease of wheat is streak mosaic, which is caused by a virus that is transferred from volunteer plants to newly planted seedlings by the wheat curl mite. In this example, the wheat curl mite is called the:
- A) pheromone B) parasite C) pathogen D) vector E) alternate host
- D 26. Corn ear development is divided into six stages, R1 thru R6. The R3 stage is also described as the:
- A) blister stage B) dent stage C) dough stage D) milk stage E) silking stage
- C 27. Using a deep tillage tool in an attempt to break up compact layers in the soil that might be limiting root growth is commonly called:
- A) fallowing B) banding C) ripping D) strip tilling E) ridge tilling
- D 28. Nitrogen from fertilizer or manure may sometimes 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) denitrification releasing a “greenhouse gas” (contributing to global warming)
D) all of the above are possible ways nitrogen may be lost from soils under certain conditions
E) none of the above are significant, since nitrogen is so tightly held in the soil
- B 29. According to NRCS guidelines, the minimum amount of crop residue which must remain on the soil surface for a cropping system after planting to qualify as conservation tillage is:
- A) 10% B) 30% C) 50% D) 70% E) 90%
- E 30. Sustainable cropping systems are generally characterized by:
- A) legume-based rotations
B) use of integrated pest management (IPM)
C) cover crops and green manure crops
D) use of stubble mulch residue management to control erosion
E) all of the above could be common practices in sustainable cropping systems

SEE AGRONOMIC CALCULATIONS ON THE FOLLOWING PAGE

AGRONOMIC CALCULATIONS

Each question is 5 points. To receive full credit, show calculations and place answer in the box.

31. A crop consultant is evaluating an emergence problem in sunflowers. She finds an average of 33 seedlings emerged in 50-foot sections of row. The row width is 24-inches. The farmer planted 24,000 seeds per acre.

Calculate the final emerged plant population in plants per acre.

14,375 plants/acre

Calculate the percent emergence of the planted seeds.

60%

32. Your soil test recommends 40 pounds P_2O_5 per acre for grain sorghum. Fertilizers available are UAN (32-0-0), MAP (11-52-0), and KCl (0-0-60).

Select the proper fertilizer and calculate how many pounds are needed for an 80 acre field?

6154 # MAP/field

33. Prior to harvest, a producer wants to estimate grain yield of corn. The plant population is 25,000 plants/acre. Assume one ear per plant. There is an average of 588 kernels per ear and the estimated corn kernel weight is 1600 kernels per pound.

Using the standard weight per bushel for corn, what is the estimated yield in bushels per acre? (round to nearest whole number)

164 bu/acre

34. Your soil test report shows a pH of 4.8 and recommends 2.4 tons ECCE lime per acre. You have ag lime available with a 60% ECCE analysis at a cost of \$20 per ton delivered and applied.

What is the cost of the lime required for a 160 acre quarter-section field?

\$12,800/field

35. You are calibrating a sprayer and you collect 25.6 fluid ounces of water in 30 seconds from an individual nozzle. Nozzle spacing is 20 inches and the speed of travel is 7 miles per hour. Use the following formula to determine the sprayer application rate in gal/acre (GPA). (Hint: 128 fluid oz per gallon).

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

17 gal/acre

36. You wish to apply OpTill herbicide available in a 75% active ingredient water dispersible granule formulation for pre-plant burndown control of marestail prior to no-till soybeans. Your sprayer is calibrated for the label recommendation of 15 gallons of spray solution per acre for marestail control. The recommended application rate is 1.5 oz active ingredient per acre. You have a sprayer with a 450 gallon tank.

How many pounds of OpTill should be added to your 450 gallon tank?

3.75 pounds OpTill/tank