

**2012 AGRONOMY KANSAS FFA CDE
AGRONOMIC QUIZ**

Contestant No. _____ Contestant Name _____ Score _____

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

- ____1. The standard test weight per bushel for soybean is:
A) 48 pounds B) 52 pounds C) 56 pounds **D) 60 pounds** E) 100 pounds
- ____2. Which of the following Kansas crops is used as grain for human food or livestock feed, plus it is commonly used to produce oil, high fructose sweetener, biofuel (ethanol), silage, and industrial products such as biodegradable trash bags and packing peanuts?
A) alfalfa **B) corn** C) wheat D) sunflower E) soybean
- ____3. Prussic acid poisoning is a potential problem for livestock grazing which of the following forage crops?
A) alfalfa B) winter wheat C) tall fescue **D) sorghum stalks** E) native range (prairie)
- ____4. A harvest concern with regard to moldy corn seed is the potential presence of toxic levels of:
A) nitrate B) *Salmonella* **C) aflatoxin** D) vomitoxin E) *E. coli*
- ____5. The practice of no-till planting grain sorghum into the stubble of a wheat crop immediately after wheat harvest in late June is called:
A) fallowing B) intercropping **C) double cropping** D) strip cropping E) monoculture
- ____6. Because both oilseed and confectionary sunflowers grown in Kansas do not produce additional new leaves after they begin flowering, their growth habit is called:
A) dioecious B) monoecious C) biennial D) indeterminate **E) determinate**
- ____7. The top two crops in \$ value in the US and Kansas are:
A) corn and soybeans in the US; wheat and soybeans in Kansas
B) corn and wheat in the US; corn and wheat in Kansas
C) wheat and soybeans in the US; corn and wheat in Kansas
D) corn and soybeans in the US; corn and wheat in Kansas
E) corn and wheat in the US; corn and soybeans in Kansas
- ____8. Broadcast application of dry urea fertilizer to an established field of tall fescue in early March is called:
A) banding **B) topdressing** C) fertigation D) sidedressing E) foliar application
- ____9. Most of the stored food energy used for germination in a corn seed is located in the:
A) endosperm B) cotyledon C) coleoptile D) pericarp E) radicle

- ____ 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
- ____ 11. If a farmer in Central Kansas planted both a Maturity Group 3 and a Maturity Group 4 variety on the same date, which of the following crops did he plant, and what will be the most likely result?
- A) The crop is corn and the Group 3 variety would start flowering first
 - B) The crop is soybean and the Group 3 variety would start flowering first**
 - C) The crop is corn and the Group 4 variety would start flowering first
 - D) The crop is soybean and the Group 4 variety would start flowering first
 - E) The crop is soybean and they would both flower at the same time
- ____ 12. 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
- ____ 13. Cattle grazing older, established tall fescue pastures results in poor weight gains, poor body condition, fever, lameness, and in some cases a loss of hooves and tail tips. The likely cause is:
- A. prussic acid that accumulates in the new regrowth
 - B. nitrate that accumulates in the stems, especially when high rates of N fertilizer are used
 - C. fescue toxicosis from an alkaloid produced by an endophyte fungus living within plants**
 - D. fescue toxicosis from a hallucinogenic compound from ergot sclerotia that replace the seed
 - E. fescue toxicosis from vomitoxin produced by scab disease
- ____ 14. Presence of high amounts of which of the following substances is the primary concern related to the quality of ground water used for irrigation:
- A) *E. coli* bacteria **B) salts** C) pesticide residues D) nitrates E) phosphates
- ____ 15. 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 energy required to pump and distribute water with sprinkler**
 - C) lower labor costs with sprinkler
 - D) less land leveling needed with sprinkler
 - E) less leaching losses with sprinkler
- ____ 16. 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 soil moisture loss by evaporation
 - C) cooler soil temperature
 - D) less wind and water erosion
 - E) less overwintering of insect and disease pests**

- ___17. Which of the following terms or acronyms found on a pesticide label defines the protective equipment (type of clothing, gloves, goggles, respirator, etc.) that must be used by the person applying the pesticide to insure their safety and avoid risk of overexposure?
- A) EPA number B) REI C) **PPE** D) active ingredient E) signal word
- ___18. The greatest yield reduction due to drought stress in soybean varieties typically grown in Kansas generally results when the stress occurs during the:
- A) seedling emergence stage resulting in decreased plant population
B) early vegetative stage resulting in shorter plants with less leaves
C) early flowering stage resulting in poor pollination of the early flowers
D) **pod development stage resulting in high pod abortion and reduced pods per plant**
E) late seed development stage resulting in low test weight seed
- ___19. To slow the development of insect resistance (Insect Resistance Management) in crops genetically engineered with Bt technology, farmers have been required to plant a portion (usually 20%) of the field to non-Bt hybrids as a “refuge”. Some new corn hybrids like Pioneer Optimum® AcreMax™ now include “RIB” technology which means:
- A) There is no longer any refuge requirement since there are multiple resistance genes in these new hybrids (stacked traits)
B) The refuge requirement is reduced to 5% of the field that must be planted in a separate area
C) **The non-BT seed is mixed in the bag, thus no separate refuge area needs to be planted**
D) The refuge requirement has been increased to 30% of the field since rootworm resistance was reported in the Corn Belt last year
E) none of the above, “RIB technology” has to do with new drought resistance genes and does not change refuge requirements and 20% of the field must still be planted to refuge
- ___20. Syngenta and Monsanto both began selling all soybean seed by count in 2011, and other companies are expected to move quickly to bagging soybean seed by count. The standard seed count for these soybean seed bags is:
- A. 80,000 B. 100,000 C. **140,000** D. 160,000 E. 200,000
- ___21. Which of the following is the predominant cool season, introduced, perennial forage grass crop grown in Kansas for pasture and hay?
- A. alfalfa B. big bluestem C. bermudagrass D. **smooth brome grass** E. sudangrass
- ___22. Pigweed, velvetleaf, and giant ragweed are all problem weeds in row crops in Kansas that are classified as:
- A) perennial broadleaves
B) winter annual grasses
C) summer annual grasses
D) **summer annual broadleaves**
E) winter annual broadleaves
- ___23. The wheat diseases soil borne mosaic, streak mosaic, and barley yellow dwarf are all caused by:
- A) **viruses** B) bacteria C) nematodes D) fungi E) adjuvants

- ____ 24. A common disease of wheat is leaf rust, which is caused by a fungus that does not survive over winter in Kansas. However, the leaf rust spores blow in from the Southern states each spring to infect our wheat crop. In this example, the wind is called the:
- A) pathogen B) parasite C) inoculum D) alternate host **E) vector**
- ____ 25. Which of the following is the most common liquid fertilizer carrier that supplies both nitrogen and phosphorus with an analysis of 10-34-0?
- A) urea
B) urea-ammonium nitrate (UAN)
C) di-ammonium phosphate (DAP)
D) ammonium polyphosphate (APP)
E) anhydrous ammonia (NH₃)
- ____ 26. Corn reproductive growth stages start with silking (R1) and end with physiological maturity (R6). The descriptive terms for the other four reproductive stages, in sequential order from R2 through R5, is:
- A) blister → milk → dent → dough
B) milk → dough → blister → dent
C) milk → blister → dough → dent
D) blister → milk → dough → dent
E) dent → blister → milk → dough
- ____ 27. A new type of tillage tool being promoted for “one time” or infrequent use in no-till systems to incorporate some residue and break through surface compaction is currently being evaluated. This tool is called a:
- A. rotary hoe B. tandem disk C. field cultivator D. plow **E. vertical tillage tool**
- ____ 28. Phosphorus from fertilizer or manure is most likely to be lost from crop fields, and thus may harm the environment, by:
- A) runoff into surface water (contributing to eutrophication of lakes and streams)**
B) leaching into groundwater (contaminating wells used for drinking water)
C) volatilization into the atmosphere as a “greenhouse gas” (contributing to global warming)
D) all of the above are equally common ways phosphorus is lost from soils
E) none of the above are important, phosphorus does not leave crop fields even if overapplied
- ____ 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) 20% **C) 30%** D) 50% E) 75%
- ____ 30. An important environmental concern related to pesticide use is:
- A) runoff of pesticides into streams and lakes
B) leaching of persistent chemicals or breakdown products into ground water
C) point-source pollution from spills or improper disposal
D) effects on non-target organisms (native plants, adjacent crops, wildlife, fish, etc.)
E) all of the above are issues which could threaten the future of pesticide use

SEE AGRONOMIC CALCULATIONS ON THE FOLLOWING PAGES

AGRONOMIC CALCULATIONS

Two part questions are 6 points each. One part questions are 4 points each. To receive full credit, show calculations and place answer in the box. Useful conversions: 43,560 ft²/acre, 2,000 lb/ton

31. A crop consultant is evaluating an emergence problem in soybeans. He finds an average of 95 seedlings emerged in 40-foot sections of row. The row width is 15-inches. The farmer planted 140,000 seeds per acre.

a. Calculate the final emerged plant population in plants per acre.

82,764 plants / acre

b. Calculate the percent emergence of the planted seeds.

59% emergence

32. Your nutrient recommendation calls for 48 pounds K₂O per acre for grain sorghum. Fertilizers available are UAN (32-0-0), DAP (18-46-0), and KCl (0-0-60).

Select the proper fertilizer and calculate how many tons are needed for an 120 acre field?

4.8 tons KCl / field

33. To determine how much hail insurance to purchase, a producer in Western Kansas wants to estimate wheat yields before harvest. She counts down the row and finds an average of 90 heads per 2-foot row section. Row spacing in 12 inches. Assume an average of 25 seeds per head and 15,000 seeds per pound for wheat.

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

54 bu / acre

34. A fescue seed tag reads: Germination = 80% Purity = 90%
(Weed seed = 2%, Other crop seed = 5%, Inert material = 3%)

a. Calculate the percent pure live seed (% PLS).

72% PLS

b. A 50-pound bag costs \$43.20 at the local feed store.
Calculate the cost per pound of pure live seed (PLS).

\$ 1.20 / pound PLS

35. You are calibrating a sprayer and you collect of 287 ml of water in 15 seconds from an individual nozzle. Nozzle spacing is 20 inches and the speed of travel is 6 miles per hour. Use the following formula to determine the sprayer application rate in gal/acre (GPA). (Hint: 3785 ml per gallon).

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

15.0 gal / acre

36. You wish to apply 2,4-D at a rate of 0.75 pounds active ingredient per acre. You choose the product called Wally's Miracle Kill 4L (4 pounds active ingredient per gallon). If your sprayer is calibrated to deliver 20 gal per acre and you have a 640 gallon spray tank.

a. How many acres can be sprayed with each tankful?

32 acres / tank

b. How many gallons of Wally's Miracle Kill must be added to each tankful?

6 gal Miracle Kill / tank