--- ... @ ... points/question. Total points = 210

FFA Crop Management Examination
Iowa State University
June 7, 1995

Instructions: (1) Each contestant must place his/her name on the answer sheet in the appropriate space. You need not darken the circles. (2) Place your contestant number in the section entitled IDENTIFICATION NUMBER, beginning with the first digit of your number under letter A, the second digit under letter B, etc. You need not darken the circles. (3) Select the best answer from each multiple choice question and place your answer in the appropriate circle by completely darkening the choice of answer. (4) In answering true or false questions, darken the circle completely with an answer of true in the A circle and an answer of false in the B circle. (5) If you change an answer be sure you erase fully the choice of answer.

Section A - Multiple Choice

1. ______________ is a chemical found in young corn plants which provides resistance to the European corn borer.
   a. Prussic acid
   b. Coumarin
   c. DDT
   d. Dimboa
   e. Gluten

2. A soil with a pH of 5.5 is ______________ acid than a soil with a pH of 6.5.
   a. more
   b. less

3. Corn plants growing in areas of standing water will become stunted and yellow because ______________.
   a. roots are too cool
   b. roots are getting insufficient oxygen
   c. bacteria in water carry disease pathogens
   d. light reflected from water is too bright
   e. too much nitrogen fixation is occurring

4. A wetting agent (surfactant) is often added to a herbicide mixture to ______________.
   a. get more herbicide into solution
   b. increase uptake by on leaves of weeds
   c. increase speed of application
   d. reduce speed of application
   e. make it easier to clean sprayer

5. As alfalfa plants regrow following harvesting, carbohydrate reserves in the roots will ______________ until the plants are approximately 8-10 inches tall, at which time the carbohydrate reserves will ______________.
   a. decrease, increase
   b. decrease, remain constant
   c. increase, decrease
   d. increase, remain constant

6. Prussic acid poisoning is possible in cattle grazing _____ when the plants are in the vegetative stage of growth.
   a. corn
   b. oats
   c. sorghum
   d. soybeans
   e. sweetclover

7. The best weather conditions to mow, cure, and bale hay are during the time _____ Iowa.
   a. cold fronts are moving through
   b. warm fronts are moving through
   c. a high pressure area exists for several days in
   d. a low pressure area exists for several days in
   e. a stationary cold front exists for several days in

8. Alfalfa must be tripped before _____ will occur.
   a. pollination and seed set
   b. seed germination
   c. nitrogen fixation
   d. seedling emergence
   e. flowering

9 Corn pollination is dependent upon _____ to transfer _____ from the male to the female flower.
   a. bees, pollen
   b. bees, nectar
   c. wind, pollen
   d. wind, nectar
   e. Hessian flies, pollen

10. Which set of reproductive growth stages occur in correct order in corn, i.e. from first to six stages.
   a. silking, blister, milk, dough, dent, mature
   b. blister, silking, milk, dough, dent, mature
   c. silking, blister, milk, dent, dough, mature
   d. blister, silking, milk, dent, dough mature
   e. silking, blister, dough, dent, milk, mature

11. Which reproductive growth stage occurs first in soybean?
   a. blister
   b. flower (bloom)
   c. pod
   d. dent
   e. seed

12. Corn populations in Iowa will normally range from _____ plants per acre.
   a. 80 to 280
   b. 1,800 to 2,800
   c. 18,000 to 28,000
   d. 180,000 to 280,000
   e. 1,800,000 to 2,800,000

13. Soybean populations in Iowa will normally range from _____ plants per acre.
   a. 1,300 to 2,000
   b. 13,000 to 20,000
   (c) 130,000 to 200,000
   d. 1,300,000 to 2,000,000

14. A single cross corn hybrid is derived by crossing _____.
   (a) two inbred lines
   b. three inbred lines
   c. four inbred lines
   d. two varieties
   e. three varieties

15. The label on a given lot of alfalfa seed provided the following information: 96% germination, 2% other crop seed, 1% inert, 1% weed seed, and 96% purity. What is the percent Pure Live Seed?
   a. 84
   b. 86
   c. 89
   (d) 92
   e. 100

$96 \times .96 = 92\%$ (Germ) (Purity)

16. A farmer purchased seed of oats from a seed dealer at $5 per bushel which had 94% Pure Live Seed. What is the cost per bushel on a Pure Live Seed basis?
   a. $5.00
   (b) $5.32
   c. $5.45
   d. $5.56

$\frac{\$5}{.94} = \$5.32$

$\frac{\$5}{x} = \frac{94\%}{100\%}$

$94x = 500$

$x = \$5.32$

17. A farmer wishes to spray a field of oats with 2,4-D to control mustard. The field measures 1020' X 1200', and the farmer needs to know the acreage in preparation for spraying. How many acres does the farmer have in the field?
   a. 7
   b. 14
   c. 21
   (d) 28

$1020' \times 1200' = 1,224,000\ ft^2$

$1,224,000\ ft^2 \div 43,560\ ft^2 = 28.01$ Acres

18. A farmer harvested 2800 pounds of shelled corn from 0.34 acre. What is the yield of corn on a per acre basis in bushels per acre?
   a. 137
   (b) 147
   c. 157
   d. 167
   e. 177

$\frac{.34A}{1.0A} = \frac{2,800\#}{x\#}$

$.34x = 2,800 \times 1.0 = 2,800$

$x = 8,235\#$

$8,235\# \div 56\#/Bu = 147.05$ Bu

19. What is the cost per pound of nitrogen if 34-0-0, at $143 per ton, is used as the source of nitrogen?
   a. $.27
   b. $.24
   (c) $.21
   d. $.18

$2000\# \times .34 = 680\# NH_4NO_3$/Ton 34-0-0

$\$143 \div 680 = .21¢/lb\ NH_4NO_3$

20. The soil test recommendation for a field of corn is 110 pounds of nitrogen per acre. How many pounds of 46-0-0 per acre are required to meet the nitrogen recommendation of 110 pounds per acre?

a. 92 pounds
b. 120 pounds
(c) 240 pounds
d. 260 pounds
e. 300 pounds

$\frac{46}{110} = \frac{100}{x}$

$46x = 110 \times 100 = 11{,}000$

$x = \frac{11{,}000}{46} = 239.13$

21. A farmer wants to know the percent slope of a field which has a 2-foot difference in elevation between 2 points which are 50 feet apart. What is the percent slope between these 2 points?

(a) 4%
b. 8%
c. 12%
d. 16%

$\frac{2}{50} = .04 \times 100 = 4\%$

22. A farmer has agreed to rent land from a neighbor for a cash rent of $16,209. The field measures 2500 feet X 2615 feet. What is the cash rent per acre for this land?

a. $88
b. $98
(c) $108
d. $118
e. $128

$2500' \times 2615' = 6{,}537{,}500\ ft^2$

$6{,}537{,}500 \div 43{,}560\ ft^2/A = 150.08$ acres

$\$16{,}209 \div 150.08 = \$108$

23. A farmer wishing to plant 25,000 kernels of corn per acre will require how many bags of seed corn to plant 400 acres of corn if each bag of seed corn averages 72,000 kernels?

a. 125
b. 130
(c) 139
d. 145

$400A \times 25{,}000 = 10{,}000{,}000$ kernels needed for 400A

$10{,}000{,}000 \div 72{,}000 = 138.88$

24. A farmer with a 160-acre field of corn has a field cultivator that can cultivate 15.5 acres per hour. How long would it take to cultivate this field if everything is working well?

(a) 10.3 hours
b. 11.3 hours
c. 12.3 hours
d. 13.3 hours

$160A \div 15.5\ A/hour = 10.32$ hours

25. If the farmer's production costs for corn totals $265 per acre, and the selling price of corn is $2.30 per bushel, how many bushels per acre must the farm produce to cover production costs?

a. 100
b. 105
c. 110
(d) 115

$\$265 \div \$2.30 = 115.22$

26. Forty soybeans in a 10 square foot rectangle equals 1 bushel lost per acre when calculating harvest losses in soybeans. How many bushels per acre are lost if the farmer finds 80 soybeans in a 10 square foot rectangle?

a. 1.5
(b) 2.0
c. 2.5
d. 3.0

$80 \div 40 = 2$

27. A farmer needs to know the number of bushels of grain in a 26-foot diameter steel bin. The farmer measures the depth of the grain and finds that there are 10 feet of grain in the bin. If one bushel occupies 1.25 cubic feet, how many bushels are in the bin?

(a.) 4245
b. 6254
c. 6792
d. 7160

$\pi r^2 h$ = volume of cylinder

$3.14 \times 13^2 \times 10 = 5,306.6 ft^3$

$5,306.6 \div 1.25 = 4,245$ Bu

28. A farmer needs to measure off 14.5 acres in a field for the farm program. The farmer measures the field and finds that it is 1030 feet long. What is the width required to get the needed 14.5 acres?

a. 478.8
b. 505.3
c. 584.5
(d.) 613.2

$1030 ft \times x ft = 43,560 ft^2 \times 14.5 A$

$1030x = 631620$

$x = 613.2$

29. A herbicide sprayer holds 500 gallons. The farmer measures the output of the sprayer and determines 20 gallons per acre are being applied. The farmer wants to apply 1 quart of Basagran per acre postemergence to control weeds in soybeans. How much Basagran should the farmer put in a full sprayer load?

a. 4.5 gallons
b. 5.7 gallons
(c.) 6.3 gallons
d. 7.4 gallons

$500 \div 20 = 25$ A

∴ 25 quarts/sprayer load or 6.25 gallons

30. The farmer uses a corn-soybean rotation. In a normal year, the farmer wants to have 155 pounds of nitrogen per acre available for corn. Soil tests show that decomposing organic matter should provide 15 pounds of nitrogen per acre. The field yielded 55 bushel of soybeans per acre last year. How much additional nitrogen needs to be supplied to the corn?

a. 70 pounds
(b.) 85 pounds
c. 125 pounds
d. 140 pounds

N_2 credit from last years Soybeans = $55 \#/A$

N_2 credit from decomposing O.M. = $15 \#/A$

$155 \#/A - (55 \#/A + 15 \#/A) = 85 \#/A$ additional N

31. An agriculture student combined an area in the oats field for his/her Quaker Oats project that measured 1160 feet long and 85 feet wide. After the oats had been weighed and corrected for moisture and foreign material, the student had 7,905 pounds of harvested oats. What was the yield per acre?

a. 75.4 bushels
b. 89.1 bushels
c. 98.8 bushels
(d.) 109.3 bushels

$1160' \times 85' = 98,600 ft^2$

$98,600 ft^2 \div 43,560 ft^2/A = 2.26 A$

$7,905 \# \div 32 \#/bu = 247.03$ bu

$247.03 \div 2.26 = 109.3$ Bu/A

32. A farmer is going to plant 200 acres of corn next year and wants to contract the anhydrous ammonia this fall for application next spring. The farmer plans on applying 75 pounds of nitrogen per acre preplant next spring and will later side dress another 50 pounds of nitrogen per acre. If anhydrous ammonia is 82% N, how many tons of anhydrous ammonia will the farmer need?

a. 12.8
(b.) 15.2
c. 17.4
d. 19.1

$100 \#$ anhydrous ammonia $= 82 \# N$

$\frac{100 \#}{x \#} = \frac{82 \# N}{125 \# N}$

$82x = 125 \times 100$

$x = 152.44$ anhydrous

$\frac{152.44 \# \times 200 A}{2000} = 15.24$ T.

33. A 0-0-60 fertilizer will contain more _____ than _____.
   a. nitrogen, phosphorus and potassium
   b. phosphorus, nitrogen and potassium
   (c) potassium, nitrogen and phosphorus
   d. sulfur, phosphorus and potassium
   e. phosphorus, nitrogen and sulfur

34. Nodules are most likely to be found on the roots of _____, and within the nodules farmers are hopeful _____ is occurring.
   a. corn, phosphorus fixation
   b. corn, nitrogen fixation
   c. soybean, phosphorus fixation
   (d) soybean, nitrogen fixation
   e. alfalfa, phosphorus fixation

35. _____ is a new disease recently found in soybean in Iowa.
   a. Iron Chlorosis
   (b) Sudden Death Syndrome
   c. Phytophthora Root Rot
   d. Measles
   e. Northern Leaf Blight

36. Iron Chlorosis in soybean occurs because soybean plants _____.
   a. contain too much iron
   b. are growing in acid soils
   (c) are deficient in iron
   d. are not fixing nitrogen
   e. have adequate iron but insufficient oxygen

37. A post-emergence herbicide in corn would be applied _____.
   a. prior to soil tillage
   b. prior to planting corn
   c. after planting but before emergence
   (d) after emergence of corn
   e. at time of pollination

38. Sweetclover is a forage species and is classified as a(an) _____.
   a. annual
   (b) biennial
   c. perennial
   d. winter annual

39. The recommended minimum soil temperature for planting corn in Iowa is _____°F.
   a. 30
   b. 40
   (c) 50
   d. 60
   e. 70

40. The recommended minimum soil temperature for planting soybean in Iowa is _____ °F.
   a. 35
   b. 45
   (c) 55
   d. 65
   e. 70

41. Corn has reached physiological maturity when the _____.
   a. silks have turned brown
   b. tassel has shed all pollen
   (c) black layer has formed
   d. ear moisture has reached 14%
   e. kernels begin to dent

42. The soybean cyst nematode is a(an) _____.
   a. bug
   b. disease
   c. insect
   d. virus
   (e) worm

43. The overwintering stage of the western and northern corn root worm is _____.
   (a) egg
   b. larva
   c. pupa
   d. beetle (adult)

44. Roundup is a(an) _____.
   a. fungicide
   b. fertilizer
   (c) herbicide
   d. insecticide
   e. nematicide

45. Which one of the following crops is an annual forage species?
   a. alfalfa
   b. birdsfoot trefoil
   c. bromegrass
   d. orchardgrass
   (e) sudangrass

46. Hard red winter wheat most likely would be planted during the month of _____ in Iowa.
   a. January
   b. March
   c. May
   d. July
   (e) September

47. Which one of the following crops is a legume?
   a. wheat
   b. barley
   c. corn
   d. oat
   (e) soybean

48. Corn is planted _____ and generally harvested _____ than soybean in Iowa.
   a. earlier, earlier
   (b) earlier, later
   c. later, earlier
   d. later, later

49. A farmer who has a severe lodging problem in growing soybeans can reduce the problem by _____ the planting rate.
   (a) decreasing
   b. increasing

50. A particle of clay in the soil will be _____ than a particle of silt, and a particle of sand will be _____ than either clay or silt.
   a. larger, larger
   b. larger, smaller
   (c) smaller, larger
   d. smaller, smaller

51. Corn planted on April 23 in Iowa will normally be _____ likely drought stressed at time of pollination than corn planted on May 15.
   (a) less
   b. more

52. Corn plants growing under drought stress will conserve moisture in the plants by closing the _____ to reduce _____.
   a. epidermal cells, transpiration
   (b) stomata, transpiration
   c. epidermal cells, photosynthesis
   d. stomata, photosynthesis

53. Photosynthesis is a physiological process in green plants, such as corn and soybeans, where _____ and _____ are combined in the chloroplasts to form sugar.
   (a) carbon dioxide, water
   b. oxygen, water
   c. carbon dioxide, nitrogen
   d. oxygen, nitrogen
   e. phosphorus, nitrogen

Section B - True or False

54. A sandy loam soil has a lower water holding capacity than a clay soil. T

55. A row of corn one mile in length will measure 5,280 feet. T

56. Corn for silage should be harvested when the moisture content of the plant is approximately 65%. T

57. Butyric acid is an undesirable acid to have in corn silage. T

58. A corn tassel is a male flower. T

59. A corn silk is a female flower and comprised of ovary, filament, and anther. F

60. Frost seeding is more effective with corn than with orchardgrass. F

61. Malathion is an insecticide. T

62. Prussic acid is an insecticide. F

63. Switchgrass is a cool season forage grass. F

64. Soybean seed moisture should be between 30 and 32% at harvest. F

65. Rotation of soybeans with corn for three years has been an effective control of brown stem rot in soybeans as the pathogen for this disease survives on soybean residue in the soul. T

66. Many annual weed species spread vegetatively by underground stems known as rhizomes. F

67. To reduce the hazard of winterkilling in alfalfa, Iowa farmers should not cut alfalfa during mid-September in order to increase the carbohydrate reserves in roots. T

68 Both nitrogen fixation and phosphorus fixation are undesirable and result in decreased crop yields. F

69 All fungi, viruses, and bacteria are desirable organisms and have useful purposes in crop production. F

70. All crops of economic importance in Iowa are self pollinated species. F