

I. Single-Answer Multiple Choice (2 points each): Circle the **one** solution that answers each question or completes each sentence.

1. Biodynamic agriculture

- a. views the farm as an organism.
- b. includes planting by the moon and other planets.
- c. includes enhancing biodiversity.
- d. all of the above.
- e. both a and b.

2. A successful garden usually needs at least ____ of direct sunlight per day in the summer.

- a. 2 hours
- b. 4 hours
- c. 6 hours
- d. 12 hours

3. Which of the following is a common practice in organic farming systems?

- a. Use of certified organic fertilizers
- b. Use of modern equipment
- c. Biological pest controls
- d. All of the above
- e. Both a and c

4. In the sustainability study of the three apple production systems in the Yakima Valley, which system significantly had the highest cumulative yields?

- a. The organic
- b. The conventional
- c. The integrated
- d. All three systems had similar cumulative yields.
- e. Both b and c.

5. Research studies comparing biodynamic agriculture with conventional agriculture

- a. show that biodynamic farms can compete economically with conventional farms.
- b. show that biodynamic systems have better soil quality than conventional systems.
- c. show that biodynamic systems generally have lower crop yields than conventional systems.
- d. all of the above.
- e. both b and c.

6. Green manures

- a. are often legumes.
- b. are incorporated into soil for nutrient release.
- c. tend to reduce soil humus.
- d. both a and b

7. In planning an organic garden, resources you need to consider include
- land.
 - climate.
 - fencing and equipment.
 - all of the above.
 - both b and c.
8. In the study with the three apple production systems,
- energy efficiency of each system was compared.
 - environmental impact of pesticides was calculated.
 - bee pollination of apple trees was compared.
 - all of the above.
 - both a and b.
9. The food taste tests or sensory evaluations that we do in class are not truly scientific because we have not ensured that the foods we are testing
- were grown in similar soil types.
 - were of the same variety and, if necessary, grown on the same rootstock.
 - were grown under similar environmental conditions.
 - all of the above.
 - both a and b.
10. All other conditions being equal, a soil with which of the following textures has the greatest total water storage?
- Sandy loam
 - Loamy sand
 - Sand
 - Silt loam
11. Biodynamic farming includes the use of
- compost.
 - animals on the farm.
 - 8 preparations.
 - all of the above.
 - both a and b.
11. In the study comparing the two organic and conventional wheat farms in the Palouse, one finding was that the conventional farm
- used a green-manure crop.
 - had less soil organic matter than did the organic farm.
 - had about 6 inches less topsoil than the organic farm.
 - all of the above.
 - both b and c.
12. Organic agriculture

- a. considers the soil as one of the major management components of the farm system.
 - b. often has lower yields in particular enterprises than conventional agriculture.
 - c. includes the use of fertilizers and pesticides.
 - d. all of the above.
 - e. both a and b.
13. For a farm to be sustainable it must be
- a. environmentally sound.
 - b. economically profitable.
 - c. socially just.
 - d. all of the above.
 - e. both a and b.
14. In the New Zealand study comparing biodynamic and conventional farming,
- a. the biodynamic farms were as often financially viable as the conventional farms.
 - b. the biodynamic farms had better biological soil properties.
 - c. the conventional farms generally had thicker topsoil.
 - d. all of the above.
 - e. both a and b.
15. Concerning the sale of organic food,
- a. it has grown at about 5% a year since 1991.
 - b. organic food and beverage sales in 2005 were about 2.5% of all food and beverage sales in the U.S.
 - c. natural food stores and natural grocery chains account for 80% of organic food sales.
 - d. all of the above.
 - e. both a and c.
16. The direction that a slope faces is called its ____ .
- a. percent slope
 - b. structure
 - c. angle
 - d. aspect
17. If soil textures were equal, soils with ____ structure would be the most permeable.
- a. blocky
 - b. granular
 - c. platy
 - d. prismatic
18. In what order are the master soil horizons usually seen?
- a. A, B, C, E, C, R
 - b. A, O, E, C, B, R
 - c. O, A, E, B, C, R
 - d. A, B, C, D, E, R
 - e. O, A, C, E, B, R
19. A soil layer that is massive generally has ____ permeability.
- a. rapid

- b. moderate
 - c. slow
20. A soil sample that feels gritty, forms only a slight ribbon, and only has slight stickiness and smoothness is likely a
- a. sandy loam.
 - b. silt loam.
 - c. silty clay loam.
 - d. clay loam.
21. Important soil properties that can be examined in the field to get an idea of what kind of soil one has include
- a. texture and structure.
 - b. the types of horizons.
 - c. bulk density.
 - d. all of the above.
 - e. both a and b.
21. Which layer is a zone of maximum accumulation or illuviation?
- a. A
 - b. B
 - c. D
 - d. E
22. No-till farming
- a. leaves more residue on the soil surface than conventional tillage systems.
 - b. generally has lower energy inputs than conventional tillage.
 - c. is practiced by most farmers in the Palouse.
 - d. all of the above.
 - e. both a and b.
23. Under the National Organic Program, some synthetic materials are allowed which include
- a. dormant oil.
 - b. sulfur.
 - c. pheromones.
 - d. all of the above.
 - e. both b and c.
24. The WSDA Organic Food Program
- a. can certify producers outside Washington State.
 - b. is accredited by the National Organic Program.
 - c. has no general fund money and makes its revenue from grower application fees.
 - d. all of the above.
 - e. both b and c.
25. The National Organic Program
- a. has recordkeeping requirements for organic farmers.
 - b. prohibits irradiation of food.

- c. permits the use of sewage sludge.
- d. all of the above.
- e. both a and b.

26. Labeling categories under the National Organic Program include

- a. 100% Organic.
- b. Organic (95-100% Organic).
- c. Made With Organic Ingredients (at least 50%).
- d. all of the above.
- e. both a and b.

II. Multiple-Answer Multiple Choice (1 point for each answer): Each problem set below consists of one problem with four possible answers. At least one answer listed is correct but two, three, or four of the answers may be correct. Mark "T" (for true) for each answer that solves the problem correctly and "F" (for false) for each answer that is incorrect.

27-30. Concerning farming systems,

27. integrated farmers can use synthetic chemical fertilizers.

28. low-input farming reduces inputs from off the farm.

29. no-till is a practice in which a crop is planted directly into a seedbed not tilled since harvest of the previous crop.

30. natural systems agriculture is the natural growing of annual grain crops.

31-34. Continual additions of organic matter to the soil

31. increase soil fertility.

32. generally have little effect on soil structure.

33. generally increase water infiltration rates.

34. can alter soil texture after five years.

35-38. In the study comparing the two organic and conventional wheat farms in the Palouse,

35. the conventional farm began using synthetic fertilizers in the late 1940s.

36. both farms had been in wheat production since the early 1900s.

37. wheat was grown more frequently on the conventional farm.

38. erosion rates were less on the organic farm.

39-42. The larger the size of soil particles per unit weight,

39. the faster the soil's permeability.

40. the greater the soil's water storage capacity.

41. the greater the soil's chemical reactivity.

42. the greater the soil's surface area.

43-46. In the study with the three apple production systems,

43. organic apples were usually as big or bigger than conventional apples.

44. the conventional system generally received the lowest annual soil quality index ratings.

45. the conventional system was the most energy efficient.

___ 46. the conventional system was more sustainable than the integrated system.

47-50. At McNab Ranch (Bonterra Vineyard),

___ 47. olive trees were one of the crops grown.

___ 48. sheep were used as biological pest controls.

___ 49. geese were allowed to walk around in the vineyard to eat cutworms and defecate.

___ 50. wildlife corridors and patches provided cover for beneficials that in turn helped control pests in the vineyard.

51-54. Concerning seeds,

___ 51. fertilization is necessary for seeds because they cannot germinate on their own.

___ 52. it's good to use plain garden soil as the growing medium when planting your seeds in container flats.

___ 53. most seeds don't need light to germinate.

___ 54. seeds need to be kept constantly moist in order to germinate.

55-58. In the vineyard study at McNab Ranch,

___ 55. wine produced from the biodynamic winegrapes tasted better than wine produced from the organic winegrapes.

___ 56. the biodynamic treatment had more balanced vines than the conventional treatment.

___ 57. the biodynamic treatment had better soil quality than the organic treatment.

___ 58. the only management difference between the biodynamic and organic treatments was the addition of the biodynamic preparations to the biodynamic plots.

59-62. Concerning seedlings and their containers,

___ 59. it's best to label your container flats so you know which seeds are which and when you planted them.

___ 60. when growing seedlings inside, it's best to use incandescent rather than fluorescent light.

___ 61. seedlings in the greenhouse can tolerate 16 hours of light a day.

___ 62. care must be taken not to overwater seedlings because of potential root rot.

63-66. Which of the following is important when "hardening off" plants?

___ 63. Initially set seedlings in their containers in a lightly shaded sheltered spot outside.

___ 64. Make sure seedlings have adequate moisture.

___ 65. Gradually increase outdoor time of seedlings from a few hours to eventually a full day.

___ 66. Keep seedlings protected from winds.

III. Fill-Ins (2 points for each space): Fill-in each space below with the correct word or words.

67. A soil sample can be divided into four components: organic, mineral, _____, and _____ . liquid (water) or soil solution; air

68. Foods that we have run taste tests on in class include apples, _____, _____, and _____ . cashews, carrots, bananas, pears

69. If a grower decides to organically certify her conventional cherry orchard, the transition period to become fully certified organic in the United States is ____ years. 3
70. A planned sequence of various crops growing in a regularly recurring succession on one field is called _____ . crop rotation
71. _____ are used in winemaking principally as a preservative and a disinfectant. Sulfites
72. Preparation 500 is used in biodynamics and comes from fermented manure packed in a _____ . cow horn
73. Growing-season extension tools for gardens include plastic covers for crops, fabric row cover, _____ , and _____ . hoophouse, greenhouse, tubes of water around potted plants, cold frames
74. Examination of a vertical section of a soil in the field shows the presence of more or less distinct horizontal layers. Such a section is called a _____ and the individual layers are regarded as _____ . soil profile; horizons or layers
75. In agriculture, the _____ is the period of consecutive days between the last and first frost of each year when crops can be grown. growing season
76. The two most important requirements for starting seeds in a greenhouse are _____ and _____ . water; warm temperatures
77. “Dampening off” is caused by what kind of organism? _____ A fungus
78. The name for biodynamically certified products is _____ . Demeter
79. Soil _____ is the arrangement of soil particles into compound clusters. structure
80. The ability of a soil to allow air and water movement is called _____ . permeability
81. _____ is defined as the mass of dry soil per unit bulk volume. Bulk density
82. The ____ horizon in soils is made up of parent material. C
83. _____ farming systems build the soil with compost additions, control pest naturally, and add synthetic chemical fertilizers and pesticides when necessary. Integrated
85. _____ in your garden soil are units or clusters composed of many soil particles bound or cemented together by organic substances, iron oxides, carbonates, clays, and/or silica. Aggregates