

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

1. Biodynamic agriculture

- a. requires stricter certification guidelines than does organic agriculture.
- b. includes planting by the moon and other planets.
- c. includes enhancing biodiversity.
- d. all of the above.
- e. both a and b.

2. Concerning the sale of organic food,

- a. it has grown at about 20% a year for at least the last decade.
- b. organic food and beverage sales in 2007 were about 3.5% 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 b.

3. On a hillside in the Palouse area, a garden will likely perform best if planted on a(n) ____ exposure.

- a. northern
- b. southern
- c. western
- d. eastern

4. All other conditions being equal, a soil with which of the following textures has the greatest total water storage?

- a. Sandy loam
- b. Loamy sand
- c. Clay
- d. Clay loam

5. Biodynamic farming includes the use of

- a. compost.
- b. animals on the farm.
- c. 12 preparations.
- d. all of the above.
- e. both a and b.

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

- a. Use of compost
- b. Use of modern technologies
- c. Use of fertilizers
- d. All of the above
- e. Both a and b

7. In the sustainability study of the three apple production systems in the Yakima Valley, which system significantly had the highest cumulative yields?
- The organic
 - The conventional
 - The integrated
 - All three systems had similar cumulative yields.
 - Both b and c.
8. Research studies comparing biodynamic agriculture with conventional agriculture
- show that biodynamic farms cannot compete economically with conventional farms.
 - show that biodynamic systems have better soil quality than conventional systems.
 - show that biodynamic systems generally have similar crop yields than conventional systems.
 - all of the above.
 - both b and c.
9. Green manure crops
- are often legumes.
 - are incorporated into soil for nutrient release.
 - tend to build soil organic matter.
 - all of the above.
 - both a and b
10. 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.
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 similar soil organic matter content to the organic farm.
 - had about 16 inches less topsoil than the organic farm.
 - all of the above.
 - both b and c.
12. Organic farming systems
- consider the soil as one of the major management components of the farm system.
 - more often have higher crop yields than low-input conventional farming systems in developing countries.
 - generally have lower crop yields than conventional farming systems in developed countries.
 - all of the above.
 - both a and b.
13. In planning an organic garden, resources you need to consider include
- land.

- b. climate.
 - c. fencing and equipment.
 - d. all of the above.
 - e. both b and c.
14. In the study with the three apple production systems,
- a. energy efficiency of each system was compared.
 - b. environmental impact of pesticides was calculated.
 - c. soil erosion estimates were made.
 - d. all of the above.
 - e. both a and b.
15. 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.
16. In the New Zealand study comparing biodynamic and conventional farming,
- a. the biodynamic farms were not as financially viable as the conventional farms.
 - b. the biodynamic farms had better physical soil properties.
 - c. the biodynamic farms generally had thicker topsoil.
 - d. all of the above.
 - e. both b and c.
17. 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
18. A soil layer that is single-grained generally has ____ permeability.
- a. rapid
 - b. moderate
 - c. slow
19. A soil sample that feels sticky, forms a good ribbon, and only has slight gritiness and smoothness is likely a
- a. sandy loam.
 - b. silt loam.
 - c. sand.
 - d. clay loam.
20. If soil textures were equal, soils with ____ structure would be the most permeable.
- a. blocky
 - b. granular
 - c. platy

- d. prismatic
21. Soil properties that can be examined in the field to get an idea of what kind of soil one has include
- texture.
 - the types of horizons.
 - structure.
 - all of the above.
 - both a and b.
22. Which layer is a zone of maximum accumulation?
- A
 - B
 - D
 - E
23. Under the National Organic Program, some synthetic materials are allowed which include
- cow manure.
 - sulfur.
 - pheromones.
 - all of the above.
 - both b and c.
24. The WSDA Organic Food Program
- can certify producers outside Washington State.
 - is accredited by the National Organic Program.
 - was certifying organic farmers even before the National Organic Program existed.
 - all of the above.
 - both b and c.
25. The National Organic Program
- has recordkeeping requirements for organic farmers.
 - allows GM foods.
 - permits the use of sewage sludge.
 - all of the above.
 - both a and b.
26. No-till farming
- leaves more residue on the soil surface than conventional tillage systems.
 - generally has higher energy inputs than conventional tillage.
 - helps reduce greenhouse gases compared to conventional farming.
 - all of the above.
 - both a and c.
- 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 centered on growing annual grain crops.
- 31-34. Continual additions of organic matter to the soil
- ___ 31. increase soil fertility.
- ___ 32. generally improve soil structure.
- ___ 33. do not affect 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 1920s.
- ___ 36. both farms used similar tillage operations.
- ___ 37. wheat was grown more frequently on the conventional farm.
- ___ 38. erosion rates were less on the organic farm.
- 39-42. Labeling categories under the National Organic Program include
- ___ 39. 100% Organic.
- ___ 40. Organic (75-100% organic ingredients).
- ___ 41. Made With Organic Ingredients (at least 50%).
- ___ 42. Products With Less Than 50% Organic Ingredients
- 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 organic 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. chickens were allowed to walk 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 not necessary for seeds because they can 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 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 similar soil quality to 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 fluorescent rather than incandescent 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 sunny 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. Four of the top twelve most pesticide-contaminated fruits and vegetables as determined by the Environmental Working Group are apples, peaches, _____, and _____. sweet bell peppers, celery, nectarines, strawberries, cherries, lettuce, imported grapes, pears, spinach, and potatoes.
- 68. We have had two different taste tests in class. The foods that we tasted were _____ and _____. apples; carrots
- 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. Crop rotations increase biodiversity and help control weeds, _____, and _____ on a farmer's field. insects; disease
- 71. Bulk density is defined as the mass of dry soil per unit bulk _____ . volume
- 72. Preparation 500 is used in biodynamics and comes from fermented _____ packed in a cow horn. Manure or cow manure
- 73. Growing-season extension tools for gardens include hoophouses, _____, and _____. plastic covers for crops, fabric row cover, 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 _____ . soil profile;
75. In agriculture, the growing season is the period of consecutive days between the last and first _____ of each year when crops can be grown. frost
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. Soil _____ is the arrangement of soil particles into compound clusters. structure
79. In a recent study discussed in a class handout, once children had switched from conventional food to organic food, organophosphate pesticides that we can measure in the children’s _____ disappeared in 8 to 36 hours. The same study found that pesticide levels in the children were even higher in the _____ (hint: which season). Some scientists believe that human beings, exposed to pesticides in _____ doses on a daily basis, may face health concerns down the road. Urine or saliva; winter; low or low-level
80. If you have a backyard soil that is of poor quality for a garden, one solution is to grow your garden in _____ . raised beds
81. When planting your vegetable seeds in a planting mixture, good containers for the planting mixture include cutoff milk cartons, _____ , and _____ .deep-sided aluminum pans, special seed-starting systems, wooden flats (with some small gaps in the bottom for drainage).