

State of Iowa
DEPARTMENT OF EDUCATION
Bureau of Technical and Vocational Education
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Boone High School
Boone, Iowa
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Iowa FFA Soil Career Development Event

(Mark the best answer on the score card)

1. Assume you are a farmer, why would you implement conservation tillage on your land?
 - a. reduces soil erosion by wind and water
 - b. maintains or improves soil tilth and efficient moisture use
 - c. provides food and cover for wildlife
 - d. All the above are true
2. Conservation tillage
 - a. is most effective when used with other conservation practices including contouring, grassed waterways, field borders, etc.
 - b. should not be used on cropland where excess sheet and rill erosion are a problem
 - c. is any tillage and planting system that leaves any amount of the soil surface covered by crop residue
 - d. All of the above are true
3. A general rule that helps farmers manage residue includes:
 - a. higher plant population and wider rows increases residue at harvest
 - b. shallower tillage depth leaves more residue on the surface
 - c. faster tillage speeds leave more residue on the surface
 - d. All the above are true

4. Using this information, predict your percent of ground cover after planting:

<u>Tillage operation for corn</u>	
% after harvest	.95
% after winter decomposition	.90
spring chisel (straight shanks)	.60
anhydrous application	.85
planting	.90

- a. 36%
 - b. 40%
 - c. 42%
 - d. 75%
5. Practices which will help leave more residue include
 - a. reduce the number of tillage passes
 - b. fall till soybean ground
 - c. use twisted shanks instead of straight shanks and sweeps on chisel plows
 - d. None of the above are true

6. What is true about terraces?
 - a. Terraces are beneficial in achieving cleaner water being carried off the field in a non-erosive manner.
 - b. Terrace spacing is determined by soil type, slope and use of other conservation practices.
 - c. Broadbase terraces should not be built on land slopes greater than 8 percent.
 - d. All the above are true.

7. When establishing field borders, follow these guidelines:
 - a. Prepare a firm seedbed; drill the grass and legume seed over the strip 1 to 2 inches deep or broadcast on the surface.
 - b. If possible, drill up and down the slope; this will reduce erosion.
 - c. Seed the area with a recommended seeding mixture; oats may be seeded as a nurse crop. Apply lime and fertilize after seeding.
 - d. None of these are completely true.

8. A crop rotation's effectiveness depends on
 - a. capability of the land; rotations work best with other conservation practices such as conservation tillage, contouring and grassed waterways
 - b. the type of crops used in the rotation and how the crops are grown
 - c. how the crop residue is managed
 - d. All of the above are true

9. Grassed waterways can best be maintained by
 - a. not mowing the waterways
 - b. planting end rows along the side of the waterways
 - c. lifting implements out of the ground as you cross the waterway
 - d. All the above are true, plus not fertilizing because this may cause contamination of water.

10. When planting contour stripcropping:
 - a. make sure not more than half of the field is in meadow any one year
 - b. strips of row crops are alternated with strips of meadow or close growing crops
 - c. there will generally be odd areas which can be used for producing additional corn; this is an important factor when corn prices are high
 - d. be sure to use a good herbicide; carryover won't be a problem

11. When soil is left undisturbed from harvest to planting except for nutrient inject, this is referred to as
 - a. no till
 - b. mulch till
 - c. ridge till
 - d. conventional tillage

12. Soil texture can be determined by:
 - a. a laboratory procedure called mechanical analysis
 - b. feeling it with your fingers; this is called "ribbon test"
 - c. both "a" and "b" are true
 - d. visual observation

13. There are eight land capability classes based on the degree of hazard or limitation for use of the land.
- Class I land is suitable for nearly any use. However, tile drainage is often recommended. It is colored green or blue on a land capability map—depending on its drainage status.
 - Class II land is good land that generally has slopes between 2 and 5 percent. It needs erosion control such as contouring or conservation tillage. On a land capability map, its color is orange.
 - Class III land may have between 5 and 14 percent slope. It could be droughty caused by sandy texture. This land could also be 0 to 1 percent slope and clayey. It is red on a land capability map.
 - All the above are true.
14. Land capability subclasses are specified on the basis of the type of hazard or limitation restricting their use. Four subclass symbols used on land capability maps are:
- w = water or wind erosion
 - d = drainage problems
 - s = acidity or alkalinity; other unfavorable physical or chemical characteristics
 - t = sandy or clayey textures
15. Class IV Land can best be used for
- hay or pasture most of the time
 - pasture or woodland
 - grazing, forestry or wildlife
 - row crops 50% of the time and forage crops 50% of the time as long as terraces or contour stripcropping is used along with mulch tillage
16. Corn Suitability Ratings reflect the integrated effects of numerous factors that influence the yield potential and use of the soil for row-crop production. For an example,
- Soil properties and weather conditions are the dominate factors that affect yield potential.
 - Slope characteristics are major factors that determine the intensity of land use for row crops.
 - Slope gradient and length affect erosion rates, water infiltration, and ease as well as efficiency of machine operation.
 - All the above are true.
17. A band or strip of perennial vegetation, usually grass or legumes, next to cropland on the outside of a field is referred to as
- diversions
 - field borders
 - grassed waterways
 - water control basins
18. Bands of grass or legumes that filter runoff and other contaminants before they reach water sources are
- cover crops
 - strip cropping
 - filter strips
 - crop rotations

19. Farmers now have conservation compliance plans for their land. These plans:
 - a. outline the decisions the farmer has made to show which conservation practices will be used and when they will be implemented
 - b. must be followed carefully for 5 years before being revised
 - c. are to be implemented with the farmer paying for 50% of the expenses and with the U.S. Department of Agriculture providing matching funds
 - d. All the above are true

20. Farming practices which enhance the environment include:
 - a. contour farming, strip cropping and buffer strips
 - b. grassed waterways, crop rotations, farm ponds and windbreaks
 - c. terraces, filter strips, and cover crops
 - d. All the above

21. When measuring residue, repeat the following procedure(s) at least 3 times in different areas of the field and average the findings:
 - a. Use any line that is equally divided into 100 parts. Fifty-foot cable transect lines are available for this purpose. Another tool is a 50-foot nylon rope with 100 knots, six inches apart. Using the 6-inch and foot marks of a 50-foot tape measure also works well.
 - b. Stretch the line diagonally across the rows. Count the number of marks (tabs or knots) that have residue under them when sighting from directly above one end of the mark. It is important to use the same point on each mark for accuracy. Don't count residue smaller than 1/8 inch in diameter.
 - c. Walk the entire length of the rope or wire. The total number of marks with residue under them is the percent cover for the field. If your rope or tape has only 50 marks, multiply by 2; for 25 marks, multiply by 4.
 - d. All the above are part of the correct procedure.

22. Corn Suitability Ratings assume an adequate level of management. An index of 100 is reserved for those soils that:
 - a. are located in areas of least favorable weather conditions in Iowa
 - b. have high yield potential
 - c. can not be continuously row cropped
 - d. have inadequate surface or subsurface drainage

23. Land which is blue on land capability maps:
 - a. can be used occasionally for cropland under careful management but is better suited for hay or pasture most of the time
 - b. usually must have crops rotated with more soil conserving crops or have intensive practices installed such as terraces
 - c. is not suited for cropland but is not likely to be damaged by pasture or woodland use
 - d. needs erosion control such as contouring and conservation tillage. Land in this class may need tile drainage.

24. Land which is red on land capability maps:
- can be used occasionally for cropland under careful management but is better suited for hay or pasture most of the time
 - is fairly good land, but needs rotation including soil conserving crops or have intensive practices installed such as terraces.
 - needs erosion control such as contouring and conservation tillage
 - has few limitations; intensive crop production is recommended
25. When evaluating internal drainage, a uniform gray colored subsoil would indicate this characteristic as being
- excessively drained
 - well drained
 - somewhat poorly drained
 - poorly or very poorly drained
26. Calcareous soil conditions sometimes cause
- acidity of the soil
 - increased availability of phosphorus for corn and alfalfa
 - iron deficiency in soybeans
 - all the above are true
27. Water-holding capacity of a soil is affected by soil texture. As the size of the soil particles increases, the water-holding capacity
- decreases
 - increases
 - is not affected
 - remains the same
28. Soil horizons can be distinguished because they differ from one another in such properties as:
- hardness, texture and vegetation
 - color, texture, structure and hardness
 - texture, structure and pH
 - fertility, drainage, and landscape position
29. A soil profile is a:
- horizontal section that shows the color, texture and structure of the soil
 - soil horizon plus the bedrock
 - vertical section through the layers that make up a soil
 - combination of the E horizon, C horizon and R horizon
30. Regarding Land Capability Classes VI, VII, and VIII:
- they are all unsuited for cultivation
 - they can be productive providing effective erosion control measures are followed to limit soil erosion; practices to include contouring, strip cropping, terracing and conservation tillage
 - always plant high-quality seed on these classes of land
 - both "b" and "c" are true

31. Parent material which is primarily silt-sized rock material transported by wind is called:
- Alluvium
 - Colluvium
 - Loess
 - Residuum
32. Prairie soils developed under grass vegetation usually:
- are 5 to 7 inches thick and unlaidd by an E horizon; the B horizon has an accumulation of clay
 - are 5 to 10 inches thick; are dark; have E horizons between the A1 and B horizons
 - show growth of water-loving vegetation, accumulation of organic materials and the formulation of peat
 - have thick, dark, A1 horizons; B horizons have less clay than those of forest soils unless the topography is flat
33. Soils which are usually fertile, show low permeability to air and water, and have high resistance to root penetration are:
- clay texture
 - loam texture
 - sandy texture
 - silty
34. Subordinate distinctions with master horizons that are used in Iowa soil survey reports: (used as suffixes)
- a - highly decomposed organic matter
 - t - accumulation of clay
 - y - accumulation of gypsum
 - all the above are true
35. Organic matter
- increases the absorption and retention of moisture as well as nutrients for plant growth
 - enhances structural development and stability of soil aggregates
 - provides a more favorable soil tilth quality
 - all the above are true
36. Soils best suited for treatment of effluent
- have good water and air relationships in both the top soil and subsoil
 - occur on upland landscapes, are more than six feet deep, are well drained
 - both "a" and "b" are true
 - has a seasonal high water table, has slow permeability, is shallow to bedrock
37. For moderately eroded land, farmers need to
- reduce the number of years row crops are included in a rotation
 - use terraces, contouring or contour strip cropping
 - both "a" and "b" are true
 - none of the above are true

38. Intermittent drainageways are areas where water flows through uplands and terraces during and after a rain. The water flow is wide and shallow. These areas become dry at other times although tile drainage may be required if crops are to be grown on them. What are sometimes used to protect these drainageways from erosion?
- more tiling
 - grassed waterways
 - more terraces
 - narrow row cropping and mulch tillage
39. Assume that you just completed the determination of percent slope to be 5 percent. Therefore, the slope group would be:
- nearly level
 - gently sloping
 - moderately sloping
 - strongly sloping
40. If your soil's E horizon has a gray color and acid condition, when crops are grown
- lime and fertilizer are needed
 - be sure to use mulch tillage
 - tile this land at a deeper depth
 - all the above are true