

CURRENT ISSUE TEST

“Agricultural Soil and Water Conservation Stewardship”

Oregon Envirothon

May 5, 2017

Team ID _____

Total Score _____/50

CONSERVATION PROGRAMS

- 1) What is the purpose of Financial Assistance Conservation Programs? *(1 point)*

- 2) Name a conservation program from the Agricultural Act of 2014 (U.S. Farm Bill). *(1 point)*

- 3) The Highly Erodible Land Conservation provisions of the Food Security Act of 1985 reduce soil erosion by: *(1 point)*
 - a) Prohibiting subsoil tillage
 - b) Requiring compliance to maintain financial assistance eligibility
 - c) Providing financial incentives to reduce erosion rates
 - d) Requiring the use of no-till farming

- 4) A Federal agency responsible for administering conservation programs on private agricultural and forest land is: *(1 point)*
 - a) Soil and Water Conservation Districts
 - b) Oregon Department of Agriculture
 - c) Natural Resources Conservation Service
 - d) Bureau of Land Management

CONSERVATION PLANNING

- 5) A farmer wants to plant a cover crop that is good at reducing erosion, will provide good supplemental grazing, and will attract beneficial insects. Use the table from the “Pacific Northwest Cover Crop Selection Tool” to recommend a cover crop mix of two plants where each objective will be met by at least one plant. *(2 points)*

- 6) To conserve water and energy irrigators convert open irrigation ditches to piped delivery systems. Describe how this practice can negatively affect wildlife. *(2 points)*

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- 7) Irrigation on Aridisols should be carefully managed because: (1 point)
- Soil salinity issues can be induced
 - High levels of soil organic matter will impact water holding capacity
 - Dominantly clay soil will cause excessive swell and shrink when wet
 - Soil is influenced by permafrost and at risk to cause runoff
- 8) IPM is an acronym for which conservation practice? (1 point)
- Irrigation Pollution Mitigation
 - Integrated Pest Management
 - Insect & Pollinator Meadow
 - Intensive Pasture Monitoring
- 9) To address surface water quality concerns, you have helped a farmer identify the need for a riparian buffer, a manure storage structure, and a roof runoff system to divert rainwater from the barn. Match each practice to the most appropriate site it should be installed using the farm map provided. Plan each practice only once. (9 points)
- | | |
|------------------------------|--------------|
| A. Riparian buffer | _____ Site 1 |
| B. Manure storage structure | _____ Site 2 |
| C. Roof runoff system outlet | _____ Site 3 |
| | _____ Site 4 |
- 10) Explain how pre-commercial thinning reduces the risks of wildfire. (3 points)

SOIL QUALITY/HEALTH

- 11) Which of the following is not one of the Principles of Soil Health? (1 point)
- Keep soil covered
 - Minimize soil disturbance
 - Maximize plant diversity
 - Keep soil moist
- 12) Which of the following soil quality indicators measures soil compaction? (1 point)
- Bulk density
 - Aggregate stability
 - Soil respiration
 - Slake test

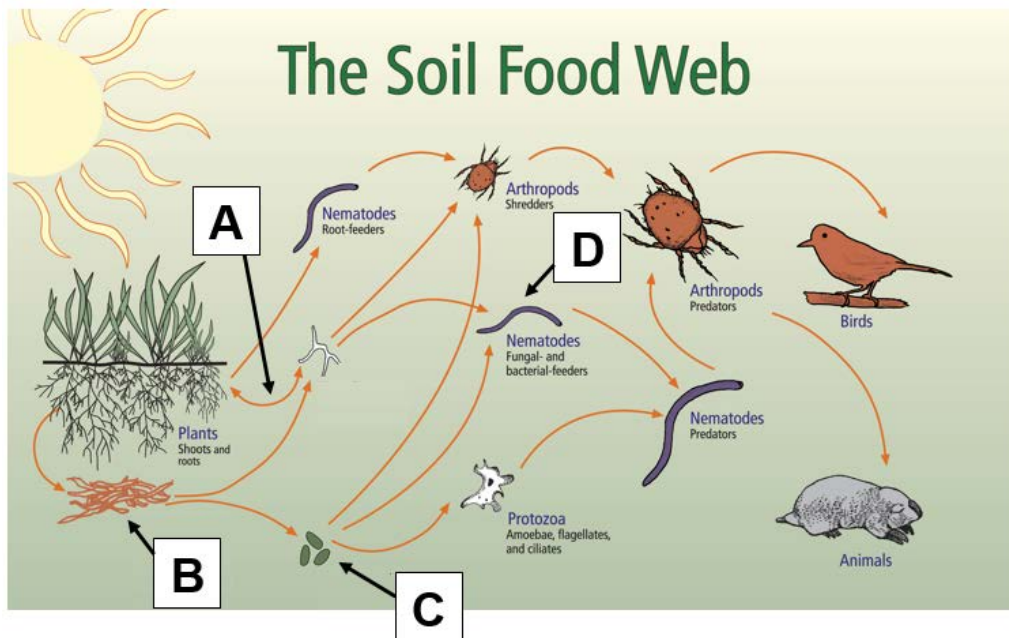
13) Soil health management systems prevent erosion in which of the following ways? Select all that apply. (2 points)

- a) Creating stable soil aggregates
- b) Decreasing water infiltration rate
- c) Preserving crop residues
- d) Reducing soil-borne disease

14) Which of the following forestry practices would not improve soil quality? (1 point)

- a) Lop and scatter slash and leave it in the forest
- b) Disperse skid trails and roads to cover a large area
- c) Preserve tree seedlings and “seed trees” during harvest
- d) Avoid operating equipment on wet soil

15) Match the lettered items identified in The Soil Food Web to their corresponding descriptions below. Each answer matches only once. (4 points)



- _____ Organism responsible for nutrient cycling through predation
- _____ Waste, residue, and metabolites from plants and animals
- _____ The exchange of carbohydrates for water and nutrients
- _____ Primary organism responsible for decomposition

SOIL EROSION

16) The Revised Universal Soil Loss Equation (RUSLE) is a model to predict what type of soil erosion: (1 point)

- a) Rill and sheet
- b) Gully
- c) Wind
- d) All of the above

- 17) The term “Loess” refers to: (1 point)
- Soil detachment from raindrop impact
 - A woven structure that traps eroding sediment
 - The sinking of organic soils due to drainage
 - Soil deposited from wind erosion
- 18) The three steps or processes of soil erosion include: (1 point)
- Detachment, transport, deposition
 - Sheet, rill, gully
 - Water, wind, subsidence
 - Displacement, movement, stabilization
- 19) Which two of the following practices would reduce effects of soil erosion from forest skid trails? (2 points)
- Increase the number of grade changes along the skid trail
 - Remove water bars
 - Construct skid trails straight up and down slopes
 - Keep skid trails at least 100 feet away from stream channels

Use the Universal Soil Loss Equation (USLE) to answer Questions 20-22 about the agricultural field described below. Use the tables provided. Round your answers to the nearest tenths and label any units.

“A 100 acre field with Willamette silt loam that receives annual precipitation of 44 inches (R Factor: 67) has a dominant slope length (L) of 150 feet with a gradient (S) of 8%. Wheat is grown using a mulch tillage system (C factor: 0.08) without any additional support practices.”

Soil Erosion Factors		
Soil Series	T Factor	K Factor
Willamette silt loam	5	0.37
Silverton silt loam	2	0.28
Dayton silt loam	3	0.43

Slope Factors			
%	100 ft	150 ft	200 ft
6	0.78	0.93	1.05
8	1.04	1.26	1.45
10	1.38	1.71	1.98

$$A = R * K * L * S * C * P$$

- 20) What is the estimated annual soil loss for this field? (7 points)

- 21) Are management or support practices needed to reduce the erosion rate below the Tolerable Soil Loss level? (*1 point*)
- a) Yes
 - b) No
- 22) If this field had Silverton silt loam instead of Willamette silt loam, would management or support practices be needed to reduce the erosion rate below the Tolerable Soil Loss level? (*1 point*)
- a) Yes
 - b) No

LAND USE PLANNING

- 23) The installation of drainage tile in an agriculture field with a Land Capability Subclass of “w” could result in which of the following? (*1 point*)
- a) The loss of important wetlands
 - b) Increased crop production
 - c) A potential change in farmer eligibility for conservation programs
 - d) All of the above
 - e) None of the above
- 24) The Southern Willamette Groundwater Management Area (GWMA) suffers from high nitrate contamination. Which of the following are potential sources of nitrate contamination? (*1 point*)
- a) Fertilizer
 - b) Manure
 - c) Septic Systems
 - d) All of the above
 - e) None of the above
- 25) Which of the following land uses would you expect to be feasible on land that has Land Capability Classification V? Check all that apply. (*2 points*)
- a) Pasture
 - b) Irrigated Cropland
 - c) Cropland with management to overcome moderate limitations
 - d) Forestry
- 26) Farmland that is very important for crop production because it has the best combination of characteristics for crop production is designated as: (*1 point*)
- a) Prime Farmland
 - b) Unique Farmland
 - c) Farmland of Importance
 - d) None of the above