

SHORELINE SITE - AGRICULTURE/2010 CEI

AG1 (3) Which of the following crops commonly grown in Leelanau County is a nitrogen-fixer (i.e., adds nitrogen to the soil)?

- A. **Alfalfa**
- B. Asparagus
- C. Corn
- D. Potatoes
- E. All of the above are "nitrogen-fixers"
- F. None of the above are "nitrogen fixers"

AG2 (3) Which of the following best illustrates the principles of sustainable agriculture?

- A. Beef cattle reared in feed lots and supplemented with hormones and antibiotics
- B. Corn genetically engineered to resist applications of herbicides such as glyphosate
- C. Fertilizer and pesticide-intensive cotton grown in the southern U.S.
- D. Shade-grown, "fair trade" coffee from Central and South America**

AG3 (3) Climate ultimately determines the type of plants that can grow in any given area on Earth. What plant(s) cannot be raised by Michigan farmers due to climatic conditions of the state?

- A. Canola
- B. Peppermint
- C. Warm season grasses
- D. Sugar cane**
- E. Woody shrubs

SHORELINE SITE - AGRICULTURE/2010 CEI (Continued)

AG4 (3) According to the US Geological Service, what percentage of the world's fresh water supply is stored in groundwater reservoirs?

- A. 0.1%
- B. 30.1%**
- C. 60.1%
- D. 90.1%

AG5 (3) Which soil type would allow for the most rapid infiltration to groundwater?

- A. Clay
- B. Muck
- C. Sandy Loam**
- D. Silty Loam

AG6 (3) What conditions would be true of a development along the lakeshore?

- A. High water table
- B. Risk of flooding
- C. Potential of septic leaching
- D. Shallow well
- E. All of the above**

AG7 (3) An underground layer of water-bearing permeable rock or unconsolidated materials (such as gravel, sand, silt or clay) from which groundwater can be usefully extracted best describes a(n):

- A. Aquifer**
- B. Ephemeral Stream
- C. Underground Storage Tank
- D. Wellhead
- E. Wetland

RIFLE RANGE - AGRICULTURE/2010 CEI

AG8 (3) In some areas it is common practice to burn grain stubble left in fields after harvesting. Which of the following is a benefit provided by such burning?

- A. Adds additional soluble nutrients to the soil.**
- B. Drives off crows and other birds that might destroy crops planted there.
- C. Improves water-holding capacity of the soil.
- D. None of the above.

AG9 (3) Which of the following statements about farm wood lots is true?

- A. Selectively harvested products from wood lots can provide as much income per acre as field crops like corn and soybeans.
- B. Shade cast on crop fields by wood lots significantly reduces yield and wood lots have little place in sustainable agriculture.**
- C. Wood lots harbor predators making livestock operations unprofitable unless all lots are removed.
- D. Wood lots provide esthetic values but cannot be a profitable part of the farm unless heavily logged.

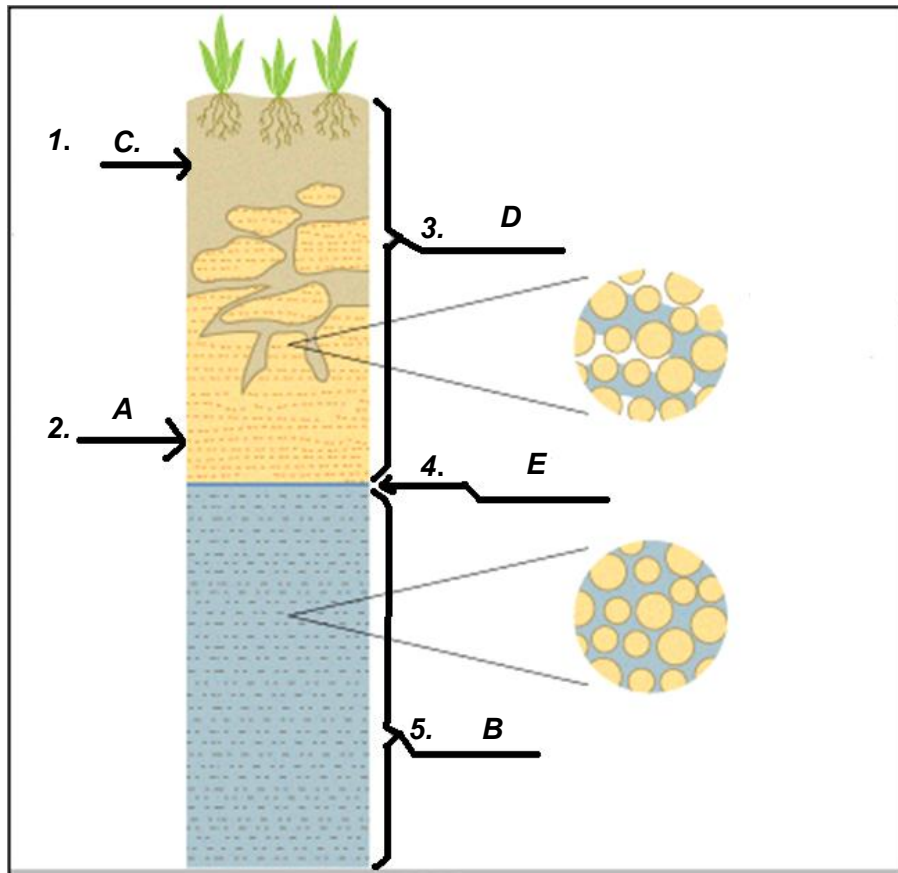
AG10 (3) Cherry farmers face a constant challenge to control diseases and pest in their crops. What do farmers do to control these problems and still be safeguarding the environment?

- A. Use cover crops between rows.
- B. Use Integrated Pest Management (IPM).**
- C. Use restricted use pesticides only.
- D. Use sustainable agriculture.
- E. Use value added cropping systems.

RIFLE RANGE - AGRICULTURE/2010 CEI (Continued)

AG11 (16) Instructions: Please label parts 1-5 on the diagram below with terms from following list (*Note- Only one term per blank, and each term can only be used once*), then use the diagram to answer Parts 6-7.

- A. Bedrock
- B. Saturated Zone
- C. Soil
- D. Unstaturated Zone
- E. Water Table



Part 6. In the saturation zone, pores in the soil are filled by:

- A. Air
- B. Nutrients
- C. Tree roots
- D. **Water**

RIFLE RANGE - AGRICULTURE/2010 CEI (Continued)

Part 7. In the unsaturated zone, pores in the soil are filled with:

- A. Air**
- B. Rocks
- C. Tree roots
- D. Water

AG12 (3) Which of the following would help to reduce soil erosion?

- A. Avoiding terracing hilly fields
- B. Fall plowing of fields
- C. Flood irrigation
- D. Windbreaks (a.k.a. shelterbelts)**
- E. None of the above

FARM SITE - AGRICULTURE/2010 CEI

AG13 (3) Which of the following is the best clue as to what was growing at this site before there was agricultural activity?

- A. Adjacent plants in the woods**
- B. Existing vegetation on the site
- C. Old equipment at the barn foundation
- D. All of the above
- E. None of the above

AG14 (3) What should be among the first things a person should consider before planning to farm at this location?

- A. Local climate conditions
- B. Market for products
- C. Personal (family) needs.
- D. Soil type
- E. All of the above**

AG15 (3) Which agricultural crop listed below is a native species ?

- A. Cherry
- B. Blueberry**
- C. Potato(e)
- D. Wheat

AG16 (3) What percent of insects are considered pests?

- A. 0%
- B. 2%**
- C. 15%
- D. 80%
- E. 100%

FARM SITE - AGRICULTURE/2010 CEI (continued)

AG17 (3) Agricultural activities can sometimes encourage invasive plants into an area. What activities might cause this to happen?

- A. Soil disturbances ie. Plowing, discing etc.
- B. Introduction of new plants
- C. Fertilizing
- D. Utilizing Herbicides
- E. All of the above**

AG18 (3) If this land were to be farmed using No-till or Reduced-till methods, what weed control, if any, would need to be used?

- A. Herbicides that would control the existing, unwanted vegetation**
- B. No weed control is needed for no-till and reduced till farming
- C. Plow the land first prior to not till
- D. Use cover crops with herbicides to reduce unwanted vegetation**
- E. Both B and D above can be used.

AG19 (3) With the farm equipment and building remains at this site as a guide, what crops would most likely have been grown here?

- A. Carrots
- B. Cherries
- C. Corn
- D. Hay
- E. Oranges
- F. C & D above**

AG20 (3) What would be a possible advantage of raising a crop not native to or not typically grown in this area?

- A. Keep the neighbors guessing.
- B. Little or no known insect and disease problems to deal with.
- C. Provide a new locally grown product.
- D. A & B
- E. B & C**
- F. None of the above

FARM SITE - AGRICULTURE/2010 CEI (continued)

AG21 (3) In an integrated farming system what part could livestock play?

- A. Provide for food such as meat, eggs or milk for sale.**
- B. Provide fertilizer for crops.**
- C. Recycling of trash through the animals.
- D. None of the above
- E. All of the above

AG22 (6) An abandoned well is a direct conduit from the surface to the aquifer below. Contaminants that enter the well are introduced directly into the aquifer with no opportunity for natural filtration by soils or geologic materials.

Part 1. Of the following, which would be the most long-term and effective method for closing an abandoned well?

- A. Bury the well and plant vegetation over top
- B. Disconnect the pump only
- C. Fill with clay**
- D. Fill with field stones

Part 2. What would be the most likely reason for closing an abandoned well at this farm site?

- A. Located too closely to an active outhouse or septic drainfield
- B. Loss of aquifer pressure
- C. Risk of chemical contamination
- D. Safety hazard (could cause injury to visitors)**

URBAN SITE - AGRICULTURE/2010 CEI

AG23 (3) Why are Reduvid Bugs, Ladybird Beetles and Syrphid Flies regarded the way they are by farmers and gardeners?

- A. They do nothing
- B. They carry plants disease pathogens
- C. They feed on many agricultural crops
- D. They feed on pest insects**
- E. None of the above.

AG24 (3) Cover crops:

- A. Help prevent soil erosion**
- B. Increase fertilizer usage
- C. Maximize leaching potential
- D. All of the above
- E. None of the above

AG25 (3) A mature maple tree provides all of the following benefits to water quality in an urban setting, except:

- A. Anchors soil in place
- B. Provides shade/cooling to urban streams
- C. Root uptake of excess water
- D. Root uptake of excess road salts**
- E. Water dispersal

AG26 (10) Instructions: Please match the groundwater pollutant to the most likely source: *Note- Only one term per blank, and each source can only be used once. 2pts.each.*

- 1. Chlorides **E.**
- 2. E. coli **D.**
- 3. Gasoline **B.**
- 4. Nitrogen **A.**
- 5. Pesticides **C.**

- A. Corn field**
- B. Leaking underground storage tank**
- C. Orchard**
- D. Residential septic system**
- E. Sedimentary rock or soils**

URBAN SITE - AGRICULTURE/2010 CEI (Continued)

AG27 (3) On Fertilizer bags what do the N-P-K stand for?

- A. Brand name of the manufacturer
- B. Nitrogen – Phosphorous – Potassium**
- C. Abbreviation of the uses in various crops
- D. A time / expiration date
- E. Percentages of deadly ingredients

AG28 (3) Which activity creates the greatest withdrawal of groundwater in the United States?

- A. Irrigation**
- B. Mining
- C. Public supply
- D. Thermoelectric power

AQUATIC SITE - AGRICULTURE/2010 CEI

AG29 (3) Based on your observations of this site, which of the following statement(s) is (are) true.

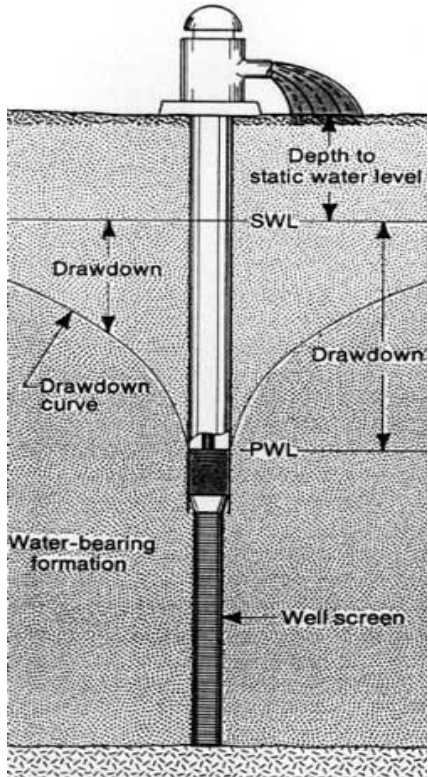
- A. After clearing this land of all woody debris this site would be an ideal location for growing field crops such as corn and wheat.
- B. Flooding of the site would restore nutrients to the soils and would aide in early germination of winter wheat.
- C. The sandy soils of this site would have some level of difficulty sustaining sufficient hydrology to keep deep-rooted plants well watered.
- D. All of the above
- E. **None of the above**

AG30 (3) The process of precipitation eventually adding water into the porous rock of an aquifer is called:

- A. Aquifer fill up
- B. Groundwater recharge**
- C. Intermingling
- D. Percolation

AQUATIC SITE - AGRICULTURE/2010 CEI (Continued)

AG31 (6) For question G13, please consider the following diagram:



The **Static Water Level or (SWL)** is defined as the level at which the water stands in a well or unconfined aquifer when no water is being removed from the aquifer.

The **Pumping Water Level or (PWL)** is the level of the water in a well when pumping is in progress.

The difference between the SWL and PWL (distance) is called **drawdown**.

Part 1. Given the information above, which of the following statements would be false:

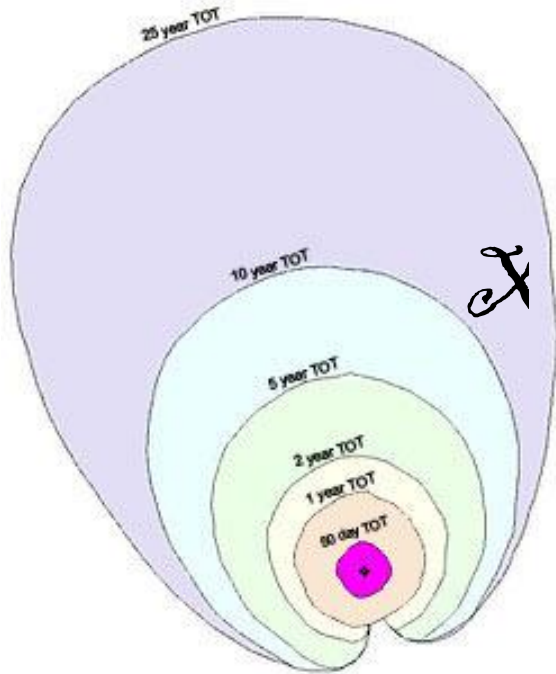
- A. A well should not be set shallower than the $\frac{1}{2}$ SWL.
- B. A well should be tested to determine the amount of drawdown before regular use.
- C. The amount of drawdown is always constant, no matter what.**
- D. The water level in an aquifer is higher when not in use.

Part 2. If the rate of recharge for the aquifer pictured in the example is 500 gallons of water per day, what would be an acceptable pumping rate to maintain a constant water supply?

- A. 250 gallons per day
- B. 500 gallons per day
- C. 1,000 gallons per day
- D. All of the above
- E. Both A and B**

AQUATIC SITE - AGRICULTURE/2010 CEI (Continued)

AG32 (6) For question AG29, please consider the following diagram:



The ring at the center of the diagram represents the wellhead of a municipal water supply. Given the geological makeup of the aquifer in this example, the larger outer rings represent the direction and rate of groundwater migration toward the wellhead. In the picture, TOT stands for Time of Travel.

Part 1. Define wellhead:

- A. A mass of ice which may be moving, or has moved, overland.
- B. An underground layer of water-bearing permeable rock or unconsolidated materials from which groundwater can be usefully extracted.
- C. A well that reaches water capable of rising to the surface on its own, by internal hydrostatic pressure.
- D. The source of a well, usually represented by the structure built over a well.**

Part 2. If a toxic chemical pollutant entered the groundwater at the site marked 'X' in the picture above, how many years would it take to reach the wellhead and thus contaminate the water supply?

- A. 1 year
- B. 5 years
- C. 10 years
- D. 25 years**