

CHAPTER 36: Plant Nutrition

1. How do the four major elements of life enter plants?

2. What is the difference between macronutrients and micronutrients?

3. Why is magnesium important for plants?

4. What are the effects of nitrogen deficiency in plants?

5. Explain the characteristics of the three major horizons in the profile of a typical soil.

6. What is ion exchange and why is it important for plants?

7. What are some benefits of using inorganic fertilizers?

8. What are some disadvantages of using inorganic fertilizers?

9. Describe the role of each of the following in the path nitrogen takes from the atmosphere to becoming incorporated into a plant protein.

a. nitrogen-fixing bacteria - _____

b. nitrifying bacteria - _____

c. denitrifying bacteria - _____

10. How do the needs of heterotrophic parasitic plants differ from those of carnivorous plants?

END OF CHAPTER 36 MULTIPLE CHOICE

1. Macronutrients
 - A) are so called because they are more essential than micronutrients.
 - B) include manganese, boron, and zinc, among others.
 - C) function as catalysts.
 - D) are required in concentrations of at least 1 gram per kilogram of plant dry matter.
 - E) are obtained by the process of photosynthesis.

2. Which of the following is *not* an essential mineral element for plants?
 - A) Potassium
 - B) Magnesium
 - C) Calcium
 - D) Lead
 - E) Phosphorus

3. Fertilizers
 - A) are often characterized by their N-P-O percentages.
 - B) are not required if crops are removed frequently enough.
 - C) restore needed mineral nutrients to the soil.
 - D) are needed to provide carbon, hydrogen, and oxygen to plants.
 - E) are needed to destroy soil pests.

4. In a typical soil,
 - A) the topsoil tends to lose mineral nutrients by leaching.
 - B) there are four or more horizons.
 - C) the C horizon consists primarily of loam.
 - D) the dead and decaying organic matter gathers in the B horizon.
 - E) more clay means more air space and thus more oxygen for roots.

5. Which of the following is *not* an important step in soil formation?
 - A) Removal of bacteria
 - B) Mechanical weathering
 - C) Chemical weathering
 - D) Clay formation
 - E) Hydrolysis of soil minerals

6. Nitrogen fixation is
 - A) performed only by plants.
 - B) the oxidation of nitrogen gas.
 - C) catalyzed by the enzyme nitrogenase.
 - D) a single-step chemical reaction.
 - E) possible because N_2 is a highly reactive substance.

7. Nitrification is
 - A) performed only by plants.
 - B) the reduction of ammonium ions to nitrate ions.
 - C) the reduction of nitrate ions to nitrogen gas.
 - D) catalyzed by the enzyme nitrogenase.
 - E) performed by certain bacteria in the soil.

8. Nitrate reduction
 - A) is performed by plants.
 - B) takes place in mitochondria.
 - C) is catalyzed by the enzyme nitrogenase.
 - D) includes the reduction of nitrite ions to nitrate ions.
 - E) is known as the Haber process.

9. Which of the following is a parasite?
 - A) Venus flytrap
 - B) Pitcher plant
 - C) Sundew
 - D) Dodder
 - E) Tobacco

10. All carnivorous plants
 - A) are parasites.
 - B) depend on animals as a source of carbon.
 - C) are incapable of photosynthesis.
 - D) depend on animals as their sole source of phosphorus.
 - E) obtain supplemental nitrogen from animals.