



PLANTS

Introduction

- Water, light, temperature, and nutrients are the 4 things that affect the growth of a plant the most.
- Plants are capable of growing without soil using a method known as hydroponics.
- However, plants cannot grow if they are not given the proper nutrients.

Factors affecting the growth of the plants

Deforestation is the process of clearing forests in order to use the land for industrial, agricultural, and other purposes. Multiple factors, either of human or natural origin, cause deforestation.

Light

- Plants have evolved throughout time in different locations throughout the world.
- Some plants developed in tropical locations under the canopy of large trees while others developed on slopes of harsh mountain ranges.
- For this reason, plants have adapted to different types of light.
- There are some plants that cannot adapt easily to a new condition.
- It is important to understand the type of light that your plants need and then provide it for growth.



- From season to season light varies in intensity.
- In the winter the days are much shorter and therefore there is less light.
- During the spring the amount of light that is available starts to increase as does the intensity.
- The light and the temperature changes that come in the spring will stimulate plants to break dormancy and start to grow new leaves.
- Sunlight that is available during the summer months will encourage fruiting and flowering. During the fall months when the light starts to change again, many plants will begin shedding their leaves.

Water

- Plants have to have water. Most plants are made up of nearly 90 percent water.
- Without the appropriate amounts of water, plants will be stressed and eventually die.
- Even plants that live in the desert such as the cactus need water, they just need less of it than other types of plants.
- Water provides plants with nourishment and hydration.
- Water that is in the soil will break down minerals and other elements of the soil.
- When the plants absorb water through their roots, they will also be picking up nutrients that will travel to the cells of the plant.



- Humidity and water in the air can help encourage plant growth.
- However, providing too much water can also cause plants to die.
- Most vegetable gardens even those that are in elevated garden beds or in fabric grow bags should be provided with an inch of water each week.
- If it has rained enough during the week you do not need to water your garden.

Temperature

- Weather or temperature plays an important role in plant growth.
- Plants will slow down or speed up their growth rate based on the temperature.
- Warm temperatures encourage growth and germination.
- A warmer temperature will actually trigger a chemical reaction inside the cells of a plant and this will speed up respiration, transpiration, and the photosynthesis process.
- Plant growth is faster during warmer periods and will slow down or become dormant in a cooler period.

Nutrients

- There are certain nutrients that plants need in order to grow.
- Carbon, oxygen, and hydrogen are three of the nutrients that plants need.
- They get these from water and from air.
- The other nutrients that the plant needs are found in the soil.
- If a plant lacks any nutrient, plant growth can be stunted.
- There are 2 categories of soil nutrients needed to improve plant growth, micronutrients and macronutrients.
- Plants need more macronutrients than micronutrients.
- The macronutrients that plants need include:

Phosphorous	Sulfur
Magnesium	Calcium
Potassium	Nitrogen

Micronutrients that plants need include iron, copper, as well as several other elements.



Fertilizer for Nutrients-

- One of the problems that gardeners often face is that the soil that they use for their garden has an imbalance of nutrients.
- All of the macro and micronutrients need to be present in order for plants to grow.
- One of the best ways to ensure proper plant growth is to using natural compost or manure in the soil.
- These will add the missing nutrients to the soil as well as provide new nutrients for the plants.
- Using fertilizer is not the same as providing the plant with nutrients.
- Most fertilizers will only contain phosphorous, potassium, and nitrogen and will not have the other micro and macronutrients that promote plant growth.



- Plants that are diseased it is likely that they are missing micro or macronutrients.
- For example, blossom rot that is found on tomato plants is often caused by a lack of calcium.
- Just like people, plants that do not have a healthy diet of the nutrients they need will be affected and less likely to produce desired results.

Solved Examples

(1) How is plant growth affected by light?

Answer: Light intensity influences the manufacture of plant food, stem length, leaf color and flowering. Generally speaking, plants grown in low light tend to be spindly with light green leaves. A similar plant grown in very bright light tends to be shorter, better branches, and have larger, dark green leaves.

(2) What are the main factors affecting plant growth?

Answer: Water, light, temperature, and nutrients are the 4 things that affect the growth of a plant the most.

(3) Do plants need light to grow?

Answer: Light is one of the most important factors for growing houseplants. All plants require light for photosynthesis, the process within a plant that converts light, oxygen and water into carbohydrates (energy). Plants require this energy in order to grow, bloom and produce seed.

(4) What are nutritional factors affecting plant growth?

Answer: Nitrogen, phosphorus, magnesium, and potassium are some of the most important macronutrients. Carbon, hydrogen, and oxygen are also considered macronutrients as they are required in large quantities to build the larger organic molecules of the cell; however, they represent the non-mineral class of macronutrients.

(5) Why are nutrients important for plant growth?

Answer: Plants need nutrients for the same reasons that animals need them. They need them to germinate, grow, fight off diseases and pests and to reproduce. Like animals, nutrients are needed in larger, smaller or trace amounts for the plant to stay healthy.

(6) How is plant growth affected by water?

Answer: Water is a common trigger for seed germination. Its uptake from the soil facilitates inorganic mineral nutrition, and its flux through vascular tissues of the plant circulates minerals and organic nutrients throughout the plant.

(7) Does temperature of water affect plant growth?

Answer: When watering your plants, it is essential to use water at the right temperature. This is because the roots of your plants are very sensitive to extremes of temperature. Using water that is too hot or too cold can put your plant under stress and cause damage.

(8) Do plants depend on water?

Answer: Plants need water for photosynthesis. Absorbed by the roots, water travels through a plant's stems to the chloroplasts in the leaves. Water also helps move nutrients from the soil into the plant. Too little water can cause a plant to wilt or droop.

(9) What factors affect fertilizers?

Answer: Granule uniformity. Granule uniformity is a crucial contributor to quality fertilizer. Caking and clumping. Caking is a sign that humidity has invaded your fertilizer. Micronutrient/macronutrient segregation. Subsoil compaction. Fertilizer spreader.

(10) What are the effects of fertilizer on water?

Answer: Too much fertilizer can actually kill the plant and excess fertilizer can runoff into streams and lakes causing toxic algal blooms that are harmful to aquatic life and even people and their pets. Excess fertilizer runoff from lawns and agricultural applications also contribute to aquatic "dead zone.s" in coastal areas

Exercise

FILL IN THE BLANKS

- (1) Season to season light varies in ____.
- (2) Weather or ____ plays an important role in plant growth .
- (3) Carbon, oxygen, and ____ are three of the nutrients that plants need.
- (4) There are 2 categories of soil nutrients needed to improve plant growth, ____ and macronutrients.
- (5) Water provides plants with nourishment and ____.

TRUE OR FALSE

- (1) All of the macro and micronutrients need to be present in order for plants to grow.
- (2) Micronutrients that plants need include iron, copper, as well as several other elements.
- (3) Most plants are made up of nearly 60 percent water.
- (4) Without the appropriate amounts of water, plants will be stressed and eventually die.
- (5) Cold temperatures encourage growth and germination.

OBJECTIVE TYPE QUESTIONS

- (1) Seed is a reproductive part of a plant it consists of –
 (A) seed coat (B) cotyledons
 (C) Embryo (D) All of these
- (2) Which of the following minerals plays a major role in energy storage.
 (A) Phosphorus (B) Copper
 (C) molybdenum (D) Magnesium
- (3) Which of the following minerals helps in improving both the quantity and quality of dry matter in leafy vegetables and protein in grain crops?
 (A) Oxygen (B) Nitrogen
 (C) Carbon monoxide (D) Hydrogen sulphide
- (4) Which of the following minerals is required by the plants in large quantities?
 (A) Phosphorus (B) Copper
 (C) molybdenum (D) Magnesium
- (5) Which of the following is a group of micronutrients
 (A) N,P,K (B) Mg,Cu,Ph
 (C) B,R,K (D) None of these
- (6) The fertilizer 'urea' is rich in which element
 (A) Oxygen (B) Calcium
 (C) Nitrogen (D) Hydrogen sulphide

Answer Key

FILL IN THE BLANKS

- (1) Intensity
- (2) Temperature
- (3) Hydrogen
- (4) Micronutrients
- (5) Hydration

TRUE OR FALSE

- (1) True
- (2) True
- (3) False
- (4) True
- (5) False

OBJECTIVE TYPE QUESTIONS

- (1) (D)
- (2) (A)
- (3) (B)
- (4) (A)
- (5) (B)
- (6) (C)