



# Hydroponics

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## DESCRIPTION

Plants grow through a process called photosynthesis, in which they use sunlight and a chemical inside their leaves called chlorophyll to convert carbon dioxide (a gas in the air) and water into glucose (a type of sugar) and oxygen.

There's no mention of "soil" anywhere in there—and that's all the proof you need that plants can grow without it. What they do need is water and nutrients, both easily obtained from soil. But if they can get these things somewhere else—say, by standing with their roots in a nutrient-rich solution—they can do without soil altogether. That's the basic principle behind hydroponics. In theory, the word "hydroponics" means growing plants in water (from two Greek words meaning "water" and "toil"), but because you can grow plants without actually standing them in water, most people define the word to mean growing plants without using soil.

## AN EXTENDED GROWING SEASON

Cold climates with chilly winter temperatures and shorter day lengths prohibit plant growth. But with a hydroponics system, plants can be grown hydroponically year-round because the grower controls the temperature, light, and nutrient-supply.

## IMPROVED GROWTH AND YIELD

Hydroponics systems typically result in faster-growing, higher-yielding plants. This is likely due to the increased oxygen levels found in the nutrient solution and the carefully controlled environmental factors. By increasing a plant's oxygen levels, you stimulate root growth and enhance nutrient uptake. These optimal growing conditions equate to less stress on plants and a more bountiful harvest.

## HIGHER PLANT DENSITY

Plants grown in soil have rigid spacing guidelines that must be followed to allow each plant equal access to the soil's somewhat limited supply of water and nutrients.

Because hydroponics systems deliver a more nutrient-charged solution to the root zone, plants can be grown closer together without competing for root space.

## PLANTS CAN GROW ANYWHERE

Unlike traditional gardens that require outdoor space for plants, hydroponics systems are easily incorporated into many homes, regardless of their size or location.

## LESS WATER CONSUMPTION

Even though hydroponic systems depend primarily on water to grow plants, they use between 80 to 90% less water than plants grown in the ground. In traditional gardening, a large amount of water is applied to the soil to allow adequate moisture to reach the root zone. When moving through the soil, the water evaporates and only a percentage of it reaches the roots. In hydroponics, the water immediately reaches the roots, with little lost to evaporation. In many systems, the nutrient solution is also recirculated multiple times before becoming unusable and discarded, further improving water efficiency.

## FEWER PEST PROBLEMS

Because hydroponics systems are indoors, pests aren't as prevalent and have controlled entrances. Insects find it more challenging to infiltrate the system and attack plants. Plus, fewer pest problems mean little to no need for pesticides.

## EASIER TO HARVEST MATURE PLANTS

Plants grown in hydroponics systems are typically grown on counters, benches, tables, etc., which puts them at waist height for most growers. At this height, mature plants are easier to harvest since there's no need to bend down or kneel to reach the plants. This is an important advantage for growers with limited mobility or physical ailments that prevent them from gardening at ground-level.