DESKTOP NFT SYSTEM

GROWING & OPERATION GUIDE

Our unique hydroponic desktop NFT system has all the capabilities of a traditional sized NFT system allowing you to grow fresh, high-quality leafy greens on your desktop or kitchen counter. This system is perfect for schools, hobby growers and anyone looking for fresh produce year-round!

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ABOUT

The word hydroponics literally means “working water." Instead of depending on the soil to provide or hold needed nutrients, **fertilizers are completely dissolved in water** in these systems and circulated past the plant roots.

Production is carried out with a variety of grow media to provide plant support including rockwool, perlite, coconut coir, and peat. Regardless of what materials are used, the main premise remains the same. Essentially, hydroponics removes the middle man, which is the soil-water-plant interaction, and provides all that the plant needs right in the nutrient solution. This controlled method of production means that the delivery of nutrients can be tailored for optimum plant growth and productivity.

There are three key components that will enable you to successfully grow fresh produce in this soilless system, the growing system, the nutrient solution, and the plant itself. In this instruction manual, you’ll find some important facts and key steps in bringing together these three components. Understanding the management of each will be important in producing a successful crop.

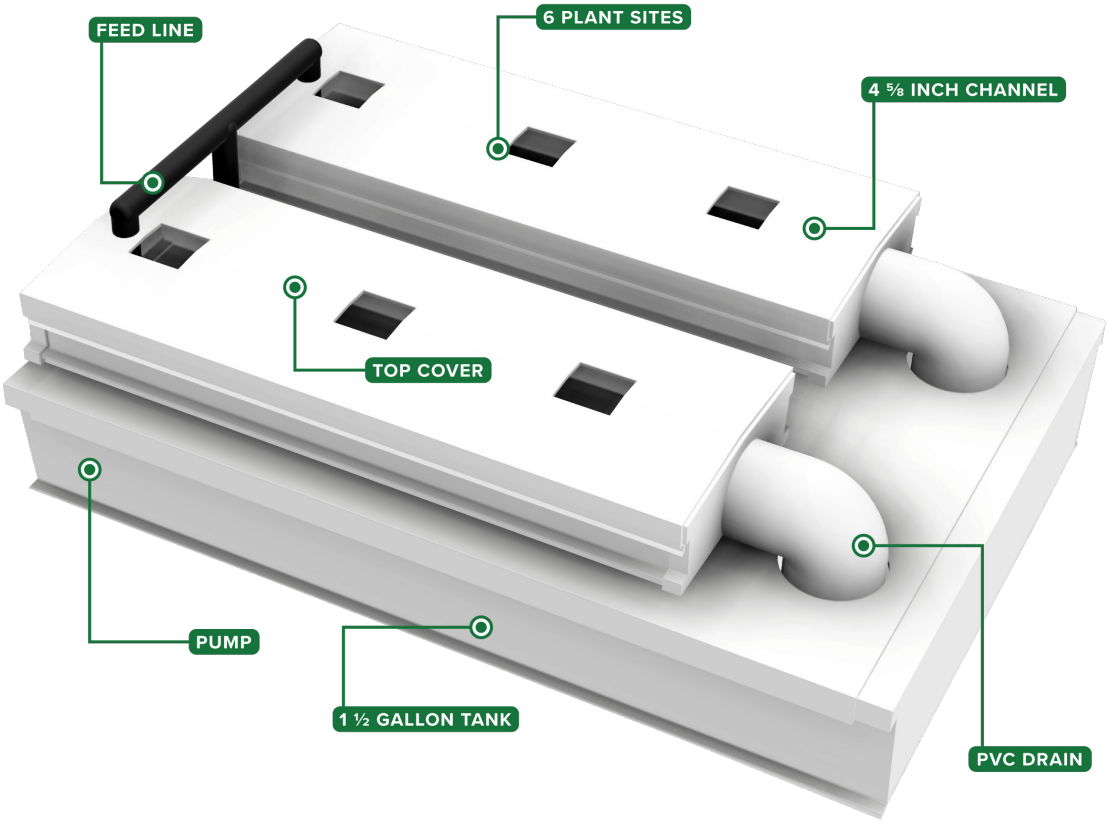
SYSTEM OVERVIEW

FEATURES

- 6 plant sites are divided between (2) 1’ x 4 ⅝’ grow channels.
- A removable top cap (lid) makes the channels easy to use and easy to clean.
- End caps on both ends of the channel, keeping light out & preventing algae growth.
- Constructed of non-toxic, food grade, UV-stabilized plastic.
- Standard electric plug – no additional power source required.
- Square top cap holes that are made for 1" seedling cubes.

SPECS

- Measures 16’L x 11’W x 4’H
- Weighs 3.5 lbs when the tank is empty & 12 lbs when it is full.



Seeds

Fertilizer

Rockwool

INCLUDES

- Pump
- Feed line
- 1 ½ gal tank
- Seeds
- Fertilizer
- Rockwool cubes

NUTRIENT FILM TECHNIQUE (NFT) & MATERIALS

NFT is a solution culture system where the **plant roots are directly bathed in a flowing nutrient solution.** There is a small stream of nutrient rich water (the film) continually flowing along the bottom of the channel. This thin flow of solution delivers the needed nutrients to the roots of the plants while also optimizing the oxygen available to the root zone.

The nutrient solution is re-circulated between the nutrient tank and channels. The reservoir under the channel allows for gravity return of the nutrient solution and then it is pumped back into the channels. Because of the short duration (6 to 8 weeks) of the crop and the fact that it's vegetative, a **recirculated solution can be used for the NFT.** However constant monitoring is needed as discuss below. The closed system also conserves the nutrient solution by greatly reducing evaporation, so most of the water loss is from transpiration from the plant leaves.

The NFT method is typically used for the production of small, leafy crops such as lettuce and herbs which have a shorter growing season than tomato or peppers. Lettuce, herbs, and other leafy crops are seeded directly into 1" rockwool cubes. These small cubes provide **consistent moisture for the germinating seeds** and also provides an excellent environment to start the growth of the young plants. Rockwool is actually basalt rock that has been heated to extremely high temperatures. This high heat melts the rock and the molten material is used to form fibers which are then shaped into the rockwool cubes. Rockwool works well for hydroponics because even when saturated with water, it has a high level of aeration.

PREPARING NUTRIENTS & SYSTEM CLEANING

CropKing's Hydro-Gro is a general purpose, hydroponic soluble fertilizer that has been formulated for the needs of the plant without taking into account your source water. It is always best to have your source water analyzed for chemical composition. **Do not use water that has been treated by a water softener** because the levels of sodium and chloride will be higher than desired for plant production.

PREPARING NUTRIENT SOLUTIONS

1 ½ Gallon Recipe

- Add ¾ tsp of Hydro-Gro & ½ tsp of Calcium Nitrate an to empty 1 gal container
- Fill container with 1 gal of warm water
- Mix until the fertilizer is dissolved & pour the solution into the systems reservoir
- Add additional ½ gal warm water to system

CHANGING THE RESERVOIR

Once a week, the nutrient solution in the reservoir needs changed. This prevents an imbalance of ions building up in the solution. The discarded solution can be used to water grass or other plants in a soil based media.

CLEANING THE SYSTEM

After harvesting a group of plants, **clean the channels** before planting or transplanting new plants into the system. It is also necessary to clean the reservoir to prevent the growth algae or other materials. Cleaning with warm, soapy water and a sponge.

SEEDING, TRANSPLANTING, & GROWING THE CROP

STEP 1: GROWING TRANSPLANTS

- Saturate the rockwool cubes before seeding. Place 6 cubes on a plate, run warm water over them, and let the excess drain for a few minutes. **This is done so the cubes are evenly moist to enable rapid germination.** Since, rockwool is industrially manufactured, flushing the cubes will remove any left over salt. If using peat or coir based media, you only be sure that the cubes are evenly moist.
- Seed the plant by placing the seeds into the indents on the tops of the rockwool cube. If using pelleted seeds, it will be easier to handle individual seeds rather than raw (or unpelleted) seed due to their small size.
- Place the seeded cubes onto a plate or utilize a seedling tray. This will allow you to start new plants while the maturing plants are in the systems channels, allowing you to continuously produce leafy greens.
- The rockwool cubes will maintain the moisture needed for the seeds to begin germination. If the conditions of your growing area lead to rapid drying of the cube's tops, you can place a small sheet of cardboard or newspaper over them for the first day or so. **Do not use a plastic dome or plastic sheet** to cover the seedlings. Light can rapidly heat up the cube which can prevent the seeds from germinating or reduce the seedling quality. Lettuce will germinate in **24–48 hours** and you will be able to see the initial root and then shoot emerging. Basil and most other herbs will take a few days to germinate.

STEP 2: TRANSPLANTING

Generally, seedlings are transplanted into the NFT channels when they are approximately **2–3 weeks old.** The larger, outside leaves should be about 2–2-1/2 inches long at transplant, and there should be 5–7 leaves in various stages of expansion. It is important that there are roots emerging from the cube to begin to take up water and nutrients for the young plant after transplanting.

- Separate the seedling cubes by gently pulling and breaking them apart. **Handle the transplants by the cube material** rather than by the leaves or stems of the plant itself.
- Turn the nutrient flow pump on as soon the plants are in the grow channel.

HARVESTING

- Unplug the system.
- Take the channel out of the growing system so you can harvest, clean, and replant.
- At the top of the channel, **firmly grasp the base** of the lettuce and the cube. Pull the plant straight up to free the roots from the channel's cover.
- Once the lettuce head is out of the channel, turn the it upside down and trim off the excess roots with scissors or break them off with your hand. Also completely removal any pale, discolored, and dried older leaves at the base of the plant.

TIMELINE OF LETTUCE CROP PRODUCTION

GROWING TIPS

TEMPERATURE MINIMUMS

For best growth, night temperatures should be at least **55°F** and day temperatures should be at least **65–68°F.** Lettuce can be grown at cooler temperatures, but the growth rate will be slowed and your total production time will be increased.

TEMPERATURE MAXIMUMS

High temperatures can lead to bolting of the lettuce plants, when they go into the reproductive growth phase. The plant becomes bitter and is not edible. Most leafy greens, such as lettuce, kale, chard, etc. are cooler season crops that **grow best in temperatures below 80–85°F.**

LIGHT

The young seedlings should receive a minimum of 150 µmoles/m2/s of light (800 foot candles) for **12–16 hours per day.** Less than this amount can bring about excessive elongation of the leaves and stem of the young plants and reduce the quality of your plants.

ARTIFICIAL LIGHT

Prior to being transplanted, artificial light may be used as a benefit during the winter months. When artificial lighting is used, be sure plants are receiving **16 hours of light and 8 hours of darkness per day.** For small systems, T5 or T8 florescent lights can be a cost efficient means of increasing light in the growing area.