



## **Albuquerque Hydroponics and Lighting**

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### **Setting Up Your Grow Room**

#### **Step 1: Consider Your Space.**

It is best to put your garden in an out of the way space like a basement, spare room, or large closet. You should enclose the room to help maintain a consistent environment. Ceiling height should be at least 5 ft. because plants in containers will be about 1 foot off the floor and the light hangs about 1 foot from the ceiling. This leaves 3 feet of grow space. Measure the square feet (length X width) of the grow room floor.

#### **Step 2: Light**

Light is the biggest limiting factor when growing indoors. This means that you can have the best space, best nutrients, best hydro system, and the best seeds, but if you are not giving your plants the best light, they will grow poorly. To find out the size light needed for your grow room simply multiply the square feet of your grow room by 20. For example: If your grow room is 4 ft by 5 ft then that equals 20 square feet. Multiply this by 20 and you get 400. This is the MINIMUM wattage light you should use. The more light you use the better your plants will grow. Fluorescent lights are good for seedlings and clones or plants under ten inches. Plants any bigger than that should be grow under HID lights (High Intensity Discharge). There are two types of HID lights: Metal Halide, which have a very balanced spectrum and are good at all stages of growth, and High Pressure Sodium (HPS), which will put out light in the red end of the spectrum which is beneficial to plants during the flowering stage of growth. When transferring plants from fluorescents to HIDs, back the HID light off and extra 6-8 inches from the plant for a few days to allow the plant to adjust to the more intense light. During the vegetative cycle of growth lights are on 18 hours. To trigger flowering cut the light cycle to 12 hours until harvest.

#### **Step 3: Air**

Fresh air is essential to good plant growth and should be circulated around the garden environment with a simple oscillating fan. A vent fan should be installed in a window or doorway to vent the grow room environment of excessive heat or humidity. Vent fans are measured in CFMs and should be able to replace the cubic volume (LxWxH) of air in the grow room in 5 minutes. Air temperature in the grow room is best kept between 70 - 80 degrees Fahrenheit. Temperatures above 90 degrees F. are not recommended as they can cause excessive plant stress. Humidity is best kept between 40% and 60%. Higher humidity will cause plant stomata to close which reduces transpiration and can slow growth. Carbon Dioxide (CO<sub>2</sub>) Enrichment should also be considered. In a closed environment the plants can use up all available CO<sub>2</sub> in about 3 hours, after that plants will stop growing. CO<sub>2</sub> is the fuel that powers the plant's photosynthetic process. Adding CO<sub>2</sub> to the grow environment can help increase yield 30%.

#### **Step 4: Growing with Soil vs. Hydroponics**

All plants will flourish in a rich organic soil. Most plants grow best in a slightly acidic soil with a pH between 6.0 and 6.8. Adding a fine dolomite lime will help stabilize your soil's pH (add approx. 1 oz of lime to 1 gal. soil). Many growers also add organics like earthworm castings or bat guano to their soil to provide additional nutrients. Hydroponics is the science of growing plants without soil. Its primary advantage is the increased growth rate. Plants can be grown hydroponically at almost twice the rate of soil. Plant nutrition is much more easily controlled with hydroponics than with soil. Weeds and plant diseases are not an issue with hydroponics. Plants grown hydroponically tend to grow faster, have a higher quality and produce a higher yield than soil grown plants.

#### **Step 5: Water and pH**

Water is essential to plant growth and makes up about 75% of a plant's weight. Unfortunately, common tap water may contain excessively high levels of salts, sulfur, or chlorine. The pH may also be out of the appropriate range. Using distilled, purified, or reverse osmosis water can eliminate many of these problems. pH is a scale from 1 to 14 and it measures the acid to alkaline balance. 1 is the most acidic, 14 is the most alkaline, and 7 is neutral. pH is directly related to nutrient uptake. If the pH is too high or too low it can prevent the plant from absorbing all of the necessary nutrient, even if it is available in the soil or nutrient solution. pH of soil should be checked every two weeks. In hydroponics the pH should be checked and adjusted every 2 days. You should use a commercial pH adjusting solution versus "homemade" remedies. Things like vinegar and baking soda can adjust your pH, but they tend not to be able to hold the pH for more than just a few hours. You will get much better results using a pH Up or pH Down adjusting solution. Most plants will thrive best in a slightly acidic solution of 6.3 to 6.5.

#### **Step 5: Nutrients**

Both soil and hydroponic plants can be fertilized with either organic or synthetic nutrients. Synthetic nutrients tend to promote fast plant growth while organics tend to produce a heavier yield and sweeter produce. Many growers use a combination of both. Organic nutrients are things like bat guano, earthworm castings, fish emulsion, kelp or seaweed. Synthetic nutrients include Miracle Grow, Peter's, General Hydroponics, or TNT. When growing in soil, most of the nutrients needed for the first month are provided. After that you can supplement with additional nutrients during watering. When growing hydroponically nutrients must be provided from the beginning. Many growers use synthetics during the vegetative stage and then switch to organics during the blooming stage to improve flavor or their produce. Plants need high Nitrogen during the vegetative stage and then during the bloom stage they need low Nitrogen and high Phosphorus to increase flowering.