Cannabis Growing guide - Water

Water:
With the short description of plant physiology, we already looked into the function of water in plants. Water has three functions: it is a building material (together with CO2 and light energy, glucose is produced), it makes the plant sturdy (the plant cells fill themselves with water, giving the plant a firm structure), and it transports nutrients throughout the plant.
Water is indispensable for the existence of plants. Remember that the law of minimums plays a crucial role here also: too little water, but sufficient light, CO2, and nutrients, produces unfit plants. Too much water, with respect to the other criteria, produces just as poor results. Therefore it's important to find an optimal balance, so the plants will flourish.

Water Quality:
It probably goes without saying, but the water you use must be as clean as possible. For plants, however, 'clean' is a relative concept. Nutrients such as nitrogen, phosphate, potassium, etc. are always dissolved in water used for plant food. In any case, the concentrations the plants need of these materials make the water undrinkable for humans. In contrast to 100% distilled water, 'pollutants' are found in ordinary tap water. You can request a chart with data about the quality from the company that produces your drinking water.

To determine the water quality (and the plant foods you add), you need 2 types of meters.
The first is an EC meter. 'EC' is the abbreviation for 'Electrical Conductivity'. Pure water, also called demineralised water, does not conduct electricity. When we add fertilizer to the water, or the water is 'polluted' in some other way, the water will indeed conduct electricity. Fortunately, home growers can make use of this property of water. With the EC meter, we can determine whether or not the concentration of nutrients in the water will provide for optimum plant growth. A high EC value means a high concentration of fertilizing materials, and a low EC value, a low concentration. Too high a concentration shows that you're over-fertilizing. As a result, your plants will dry out and burn. (By osmotic processes, water is drawn out of the plant; the leaves curl up wards or down wards.) The fertilizer concentration must be lowered by further diluting with water. Too low an EC value means a shortage of fertilizer.

EC Meter

PH Meter

The second type of meter is the pH meter. With a pH meter, you can determine the acidity of water. Most of us have measured the acidity of a solution at one time or another in high school. We did it with a litmus test. But the litmus test is not suitable for measuring acidity when growing cannabis at home. The accuracy of this test leaves something to be desired. Actually, we can only estimate the pH value, to the accuracy of one pH point. We need greater accuracy for cultivating cannabis. The average pH meter is relatively cheap, and meets the requirements well. Generally, they're up to 0.02 pH points accurate. The ability to absorb nutrients depends on the acidity of the water. If the pH is too high or too low, the plants can't absorb some nutrients properly. Then deficiency disease occurs. The pH scale goes from 1 to 14. A solution with a pH between 1 and 7 is called 'acid', a pH of 7 is called neutral, and between 7 and 14, 'basic'. The lower the pH, the more acidic the solution (in our case: water). The home grower must make sure that the pH of the water being used is approximately 5.5-6.5.

The EC meter, as well as the pH meter, must be adjusted now and then. Special calibrating fluids are available for this operation. The temperature is also an important factor when calibrating an EC meter. The correct temperature is listed on the package of calibrating fluid. Most pH meters have two set screws, or these days many are automatic and only need you to press a button. The probe of the pH meter is first dipped into a calibrating fluid with a pH value of 7.0. Then, this value is set using one of the set screws or hitting the calibration button. After that, the probe must be cleaned well; otherwise, deviations will occur with the second calibration. Next, the probe is dipped in a calibrating fluid with a pH value of 4.0, and this value is set using the other set screw or the calibration button again. It's important that the pH meter probe is kept moist in a special storage fluid supplied by the manufacturer.

Cannabis grows best with a water temperature of 20-22 degrees Celsius. Below this temperature, the roots of the plant have more trouble taking up water and nutrients. Too high a temperature is not good either. That will kill the plants. Tap water must be warmed up to 20-22 degrees Celsius. Use a water thermometer to keep an eye on the water temperature. Warming the water is easy with the installation of a heating element in the nutrient tank.

This equipment is all available from Dampkring Growshop. Quality Jager heating elements with thermostats are available for nutrient vats. For a 100 litre nutrient tank, you need a 100 Watt heating element; with a 200 litre tank, we recommend a 200 Watt element, with a 300 litre + tank the 300 Watt element is advisable. Make sure the heating element is always kept under water; otherwise it will be destroyed. This means that you must never pump all the water out of the nutrient tank to the plants. When you want to take the heating element out of the water, always disconnect it first. Then, let it cool off for at least 15 minutes. Only then can you carefully take it out of the water. Any other way, you run the risk the element will crack.

To prevent algae growth in the nutrient tank, it's important to add air to the water. We do that by means of an air pump with an aerator attached. The aerator is connected to the pump, and placed at the bottom of the nutrient tank. The water in the tank becomes rich in oxygen by aeration, and is also kept in motion. This way, algae have much less chance to proliferate.