

Flushing Cannabis - A Controversial Subject

Flushing is the technique of ceasing to provide nutrients to a plant and only giving it pH-balanced water. Flushing usually takes place 7 - 10 days before harvest. Not providing additional nutrients forces the plant to use its stored nutrients during its final week of growth. If a marijuana plant has excessive nutrients stored in its plant material, this build-up will affect the flavour, taste and quality of the flowers.

A way around this, with no flush required, is to use nutrients that do not leave an aftertaste. Just compare [Canna](#) or [BioBizz](#) nutrients with [NutriGold](#). NutriGold does not have an after-taste. Try it yourself and let us know your thoughts on [FaceBook](#). To get free samples of NutriGold, just pop into Greenthumb Hydroponics and ask for them.

Some growers, though, think flushing's usefulness is just bro-science, while others think it's an essential process that creates the best tasting buds for smoking and vapourizing.

Reasons to question the efficacy of flushing:

Eliminating or lowering the availability of essential nutrients slows growth at all stages, including the last weeks of flowering. It causes the leaves to yellow and fall off, which you want, but this also makes a mess in the grow room. Again, to eliminate the mess, we suggest using NutriGold as you can harvest before it looks like autumn in your grow room.

It can be difficult to flush large plants grown in bags as the plants' roots have a reserve of nutrients to draw from. Yet, these plants are savoured by connoisseurs. There are no studies to test the efficacy of flushing. If you flush, write to us on [FaceBook](#) and share your results with the growing community. That way everybody can learn something.

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Though certain stresses increase trichome production, it is doubtful that nutrient deficiency is one. Trichome and oil production is expensive; it requires the plant to expend energy. It seems counter-intuitive that depriving nutrients would increase cannabinoid/terpene production.

Some growers using aquaponic grow methods do not flush but produce fine buds. It is possible to flush by emptying the reservoir and filling it with just pH-balanced water for the plant's final days.

Large amounts of calcium (Ca), one of the mobile nutrients, are required for cell division. To mature, plants must grow new cells. Without a constant supply, maturation slows. Only a small amount of boron (B), another mobile nutrient, is required for growth. Without enough of it, bud maturation slows or stops. So, long flushing periods will reduce yields.

Despite no studies regarding efficacy, most growers flush, the general opinion being that depriving plants of nutrients during the last phases of flowering results in higher quality and better tasting bud. Drop us a message and let us know your experiences and thoughts.

The Basics On Flushing Cannabis

The goal of flushing is to remove most of the nutrients available to the roots, thereby forcing the plant to use the non-assimilated salts and nutrients still within it. A good flush that removes the nutrients will also improve the taste of the flowers. The result is that the plants will hold few nutrients in their raw form, and instead incorporate them into their tissues or phyto-chemicals released by the roots.

For roots to absorb nutrients, the nutes must be mixed in water. Then pH the water to the right level depending on where you live. Nutrients that are precipitated are not available to the roots even if they are plentiful. Flushing with pH-balanced water rinses out the nutrients that are already in the plant, its roots and leaves, making the leaves yellow. This is what you want.

To rinse, use tepid water (24°C) adjusted to a pH of 5.8-6.0, the range when nutrients are all soluble. With warmer water flushing, more nutrients dissolve and rinse away. The more you rinse, the more nutes will be carried away. Nitrogen is the most soluble nutrient and is likely to affect flowering negatively. Even using a rinse that drains only 10% of the added water removes some of the nutrients. But be careful not to over-water in the last stages of flowering.

Note: Chelated micro and trace elements in nutrients, such as are found in NutriGold, allow plants to absorb nutes over a wider range of pH. During flushing, these chelates will attach themselves to the excess nutrients, salts and other compounds in your plants and force them out.

Flushing Essentials: Tools To Use



Left: [The PH-033](#) is a pH/temp meter. With a micro-processor and Automatic Temperature Compensation (ATC).

Right: [The 1385 meter](#) measures EC/TDS/Temp. These tools are essential to properly adjust water nutrient solutions. If the pH is too high or too low, the plant cannot uptake nutrients.

The ideal pH level for vegetative growth: 5.2 - 5.4.

The ideal pH level for flowering: 5.8 - 6.0.

As the flush continues, the PPM (EC) of the rinse water drops. This can be stopped at any time. By leaving some N in the grow media, the plant has some resources for growth, without the abundance that promotes vegetative growth. Check the TDS/EC of dissolved solids using a meter for the water.

Two Flushing Techniques:

Start with a passive flush. Let the plants use the reserves in the solution and then perform a flush close to ripening.

Perform a constant flush. Each time the plants are watered, add enough water so 10 - 20% of it drains. The drain water will be rich in nutrients, so there is little salt build-up in the medium. There are few excess nutrients to flush near ripening.

Note: Some growers encourage vigorous vegetative growth before the plant makes a total switch to flowering. If doing so, leave the plants unflushed, or even supply a small amount of N during the first two weeks of flowering and let it deplete naturally.

pH: The salts (the nutes soluble in flush water) are adjusted to 5.8 - 6pH. It removes more nutes than water that is not pH-adjusted.

Water temperature: The solubility of nutes in the grow media is temperature-dependent - meaning salts are more soluble in warmer water. Adjust flush water to 24°C if possible. More nutrients will be flushed. The solubility of the nutes in the grow media is temperature-dependent.

Flushing techniques: passive and active. What is the difference?

The difference is that at some point in the plant's rush to ripening, the grower or nature helps the plant ripen by removing nutes from the soil. The main one removed is N, but other water-soluble nutrients are removed.

Plants growing in mixed media or soil are flushed using water. Dissolved and soluble salts are drained out. Depending on how thorough the flush, much, most, or nearly all of the soluble nutrients are removed. They are often replaced with a flowering formula containing macro or micro fertilizers and hormones, enzymes or sugars ([molasses](#)).

Plants react quickly to this sudden change in the environment by focusing their energy on the maturation of flowers rather than the continued production of flowers.

Active Flushing

Most Indica plants ripen 7 - 9 weeks after being forced into flower. However, some Sativa strains, like Purple Haze, can take as long as 14 weeks. The grow media may include ingredients that gradually release nutes. If the media is composed of peat moss, coir, or compost, its many carbon-containing molecules bind some of the nutrients and it is ready to release them when nutrient levels get low.

Depending on the size of the plant and container, the media type and the technique used, this process can take up to 3 weeks. Irrigate with nutrient-free pH-balanced water so no new nutes are provided for the last 2 weeks of flowering. For instance, a nine-week plant won't be fed after the seventh or eighth week of flowering. Bear in mind that plants are individuals and much depends on the strain and environmental conditions.

However, enriched organic soils and grow media, especially if they have been used for more than one season, are likely to contain organically locked nutrients that mycorrhizae and other rhizosphere organisms will immediately begin to unlock; this provides more nutrients to the roots. Then, as the residual nutrients are used up, the plant taps into its reserves. Some of the minerals are mobile - nitrogen (N), phosphorous (P), potassium (K), magnesium (Mg), molybdenum (Mo) -and they translocate to the canopy top, where new growth is happening and where the plant's energy provider, the lights or the sun, is available.

As the leaves lose N and Mg they turn yellow. The loss of P and K results in leaf edge curl and dead spots. After the plant has extracted the valuable nutrients from the leaf, leaving mostly cellulose, it has no further use and dies. This means that the flushing is working. The goal is to time the total loss of nutrients with the ripening of the buds so nutrient deprivation does not cause appreciable loss.

Calcium (Ca), sulfur (S), iron (Fe), boron (B) and copper (Cu) are immobile and their deficiency symptoms, which usually don't occur in late flowering, can be seen in the new growth. Iron (Fe) deficiency, though rare, often results in bright yellow leaves around the buds. But the same effect could also be caused by N deficiency late in flowering. Lack of Zn, which is rare, causes twisted atypical growth. As the leaves dry the buds continue to grow and mature. They use the reserves being drawn from the media, roots, xylem and leaves.

Flowering formula fertilizers contain little or no N. Plants growing in soil or planting mixes use the residual N loosely bound in the media that continues to dissolve. The major nutrient, N, translocates from the lower leaves to the upper canopy. The lower leaves turn yellow, curl and dry. Hydroponic mixes without media require some N during the first half of flowering (3 - 4 weeks, strain-dependent) and less during the next quarter (10 - 15 days). The lack of N towards the end of flowering hastens ripening and maturity. This is one of the cues the plant uses to begin ripening.

Flushing Times By Media

Sandy Soil: Flush for a week. It doesn't contain very much organic matter to bind the nutrients and it rinses readily.

Porous Loam: Flush for 10 - 15 days. Some nutrients are held tenuously to the matrix and need a bit more flushing than sandy soils.

Heavy Loams and Clays: Flush for 15 - 20 days. These soils bind nutrients that are hard to rinse away and must be used up by the plant.

Enriched Soils and Mixes: Soils enriched using additives like plant meals and manures may not need flushing. Soil micro-organisms dissolve the nutrients locked in organic compounds and provide them to the roots as needed. Most nutrients left are still locked up in organic matter. There is very little free N. But, if the bottom leaves are not yellowing, there is too much nutrient left in the soil and it should be flushed.

Mixed grow media: Planting mixes differ in their abilities to buffer or hold nutrients so each should be dealt with in its own manner.

Peat moss and Coco: Flush for one week if the bottom leaves are green and 3 - 4 days if they are yellow. These mediums buffer nutrients (nutrients attach to them), but flushing will have a noticeable effect on the crop. The free nutrients are already dissolved and are easily rinsed away.

Medium-free/Hydroponic Systems (aeroponic, deep water culture and some nutrient film techniques): Flush 3 -4 days. As soon as the water/nutrient solution is removed and replaced with pH-balanced water, the roots have no access to nutrients. The plants react by showing signs in the lower leaves, which turn yellow. The buds also ripen faster.

Medium-based hydroponic and fertigation systems (drip irrigation, ebb & flow, wick, capillary mat, reservoir, manually irrigated nutrient/water): Flush 4 - 7 days. The roots are usually anchored in a non-nutritive mix composed mostly of coir or peat moss. Infrequently, clay pebbles or perlite are used. None bind tightly to the nutrients so plants respond immediately to the new nutrient-free environment.

Flushing and effects within the plant

Flushes make nutrients unavailable to the roots so plants must use their reserves for growth. The free nutrients that were in the xylem or dissolved in the extracellular water bind to molecules in the plant's bio-system, creating a smoother draw and a taste far superior than unflushed cannabis.

The most popular flush is plain water. Salts in the media or in hydroponic units are all water soluble, or they're precipitated, that is, have dropped out of the solution. Precipitated nutrients cannot be taken up by the roots. Other salts are bound to larger organic molecules attached to the grow medium. These are only moderately available to the roots and are made available through mycorrhizae and other organisms in the rhizosphere (the area of the media that surrounds the roots). All other salts are soluble and drain out when flushed.

Once plants are flushed they draw from nutrients within their systems. First they use the unbound nutrients held in the xylem and the extracellular water channels. Then the mobile nutrients, nitrogen (N), phosphorus (P), potassium (K) and magnesium (Mg) migrate from the lower parts of the plant to the canopy that is getting light. A light-unobstructed plant will deliver nutrients to the sunlit sides and the top of the plant. Rather than only going up, the nutrients travel out, to the growing tips and maturing flowers. The immobile nutrients, boron, calcium, copper, iron, manganese and zinc remain stationary. Chlorophyll and other mineral-laden organelles in the cells break apart, facilitating the migration of the minerals they contain to the most active areas of the plant. Lacking the macro-nutrients, these leaves lose their green colour created by Mg, turn yellow and dry up.