

18+ blog aimed exclusively at those over 18 years old

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←**Blog**

WHAT YOU NEED TO KNOW ABOUT PH, WHEN GROWING MARIJUANA IN SOIL



Reading suggested to the Intermediate Grower

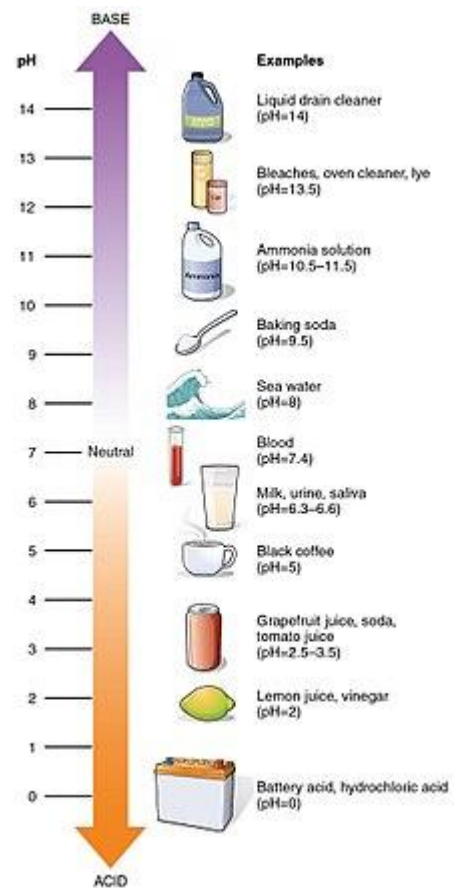
- 1. Introduction What Is pH ?**
- 2. Why is pH so Important ?**
- 3. Changing soil pH !**
- 4. What Type of Lime to Use !**
- 5. How Do You Know When You Need To Worry or Adjust Soil pH ?**
- 6. Before Adjusting Soil pH What You Need To Know !**
- 7. Testing Your Soils pH !**
- 8. How To Adjust The pH of Organic Soil In A Potted Plant !**
- 9. pH and Cloning !**
- 10. A Word About Mycorrhizal Fungi And pH !**
- 11. The Bottom Line – pH and Marijuana !**

Introduction – What Is pH ?

When growing marijuana the pH level of your soil is a main factor in determining whether you have a successful crop or not.

What is pH ? In chemistry, pH is a measure of the acidity or basicity of an aqueous solution. Solutions with a pH less than 7 are said to be acidic and solutions with a pH greater than 7 are basic or alkaline. Pure water has a pH very close to 7.

Soil pH is a measure of the acidity or basicity in soils. Soil pH is considered a major factor in soils as it controls many chemical processes that take place. It specifically affects plant nutrient availability by controlling the chemical forms of the nutrient. The optimum pH range for most plants including marijuana is between 6.2 and 7.0, however many plants have adapted to thrive at pH values outside this range. **Arbuscular mycorrhiza fungus** is what enables plants to survive outside of this pH range. [**see at the end of this page**]



pH and common products

Why pH is so Important? Nutrient availability varies in relation to soil pH

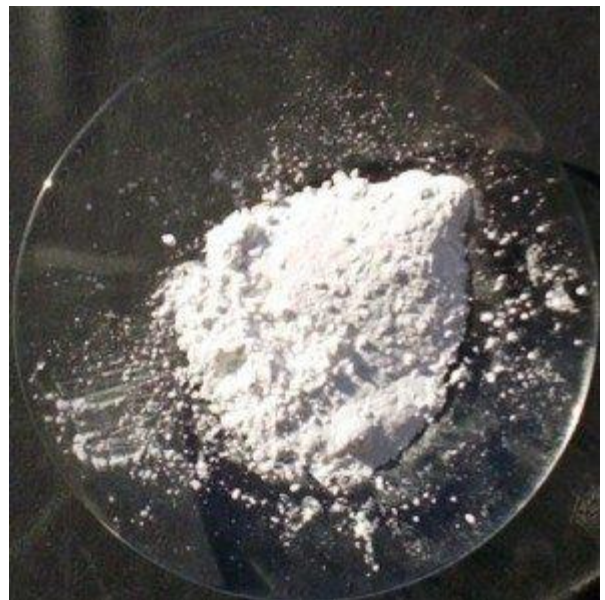
Nutrients needed in large amounts by plants are called macro-nutrients and include nitrogen, phosphorus, potassium, calcium, magnesium and sulfur. Elements that plants need in trace amounts are called trace nutrients or micro-nutrients. In the table below you can see that most nutrient deficiencies can be avoided between a pH range of 6 to 7, provided that soil minerals and organic matter contain the essential nutrients to begin with. pH levels are crucial for a successful crop of organic marijuana. On the other end it is crucial to keep a pH of 6-7 when the plant are small because they need Nitrogen and a Nitrogen deficiency i.e. leaves turning yellow is a symptom of low pH that is due to soil not properly amended with **dolomite**.



PH chart showing nutrient availability

Changing soil pH

Increasing pH of acidic soil ! The most common amendment to increase soil pH is lime, usually in the form of *finely ground agricultural lime*. The amount of lime needed to change pH is determined by how finely it is ground and the buffering capacity of the soil. Buffering capacity of soils is determined by the clay content of the soil, the type of clay and the amount of organic matter present. Soils with high clay content will have a higher buffering capacity than soils with little clay. Soils with high organic matter will also have a higher buffering capacity than those with low organic matter. Soils with high buffering capacity require a

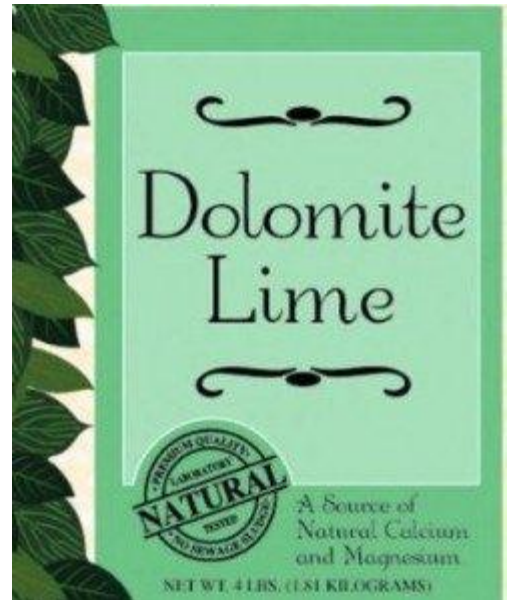


Dolomitic Lime

greater amount of lime to be added than a soil with a lower buffering capacity for the same incremental change in pH. Other amendments that can be used to increase the pH of soil include wood ash, and eggs shells, but lime is more convenient and a more accurate way of increasing pH.

What type of lime to use? The best lime to use is Dolomitic Lime also referred to as **Dolomite**.

Dolomitic lime comes from mined dolomitic limestone. The limestone when processed produces a powdered mixture of lime and 35 to 40 percent magnesium oxide. *This mined limestone is totally **organic containing calcium and magnesium** making it the best choice.* The other reason for using **dolomitic lime** is that it **will never raise the pH of your soil above 7 which is neutral**. *This holds true no matter how much dolomitic lime you use.* The best way to use dolomitic lime is to **mix it with your organic soil** before you plant in it. I use 4 tablespoons of dolomitic lime to 35 liters of soil. If you mix dolomitic lime in your soil you will *almost never* have to worry about pH during your entire grow from beginning to end. The dolomitic lime buffers your soil to keep pH in check. ***I have never had a pH problem if I mixed dolomitic lime into my soil prior to planting.***



Dolomite Lime Package

You usually do not need to decrease the pH !

Many fertilizers such as urea, urea phosphate, ammonium nitrate, ammonium phosphates, ammonium

sulfate and mono-potassium phosphate fertilizers also decreases the pH of soils.

Most if not all organic liquid fertilizers will also lower the pH of soils. Organic matter in the form of plant litter, compost, manure and peat will decrease soil pH through decomposition. This is all a good thing because we want our organic soil to



be slightly acidic for growing marijuana. When growing organic marijuana it is rare to have alkaline soil because of this decomposition of the organic matter in our soil. If for some reason you find your soil is alkaline, one way to lower the pH is with “micronized” sulfur. The



Most Organic Fertilizers lower the pH of soil

reason to use micronized sulfur is that it dissolves in water easier than regular powdered sulfur. Micronized just means it has been ground into smaller particles to dissolve easier.

Your soil mix will determine the pH.

What is the main ingredient of your soil?

If your main ingredient is “peat” your soil will be highly acidic. If your main ingredient is “compost”, your soil will be slightly acidic. If your main ingredient is “coco fiber”, your soil will be neutral. Any other ingredients you add will have an effect on the pH of that soil. This is the reason we add dolomitic lime to the soil mix, to stabilize pH.



Peat that is the main component of common pot soil, makes the soil highly acid

How Do You Know When You Need To Worry or Adjust Soil pH ?

If you incorporated dolomite lime in your soil mix you will almost never have to worry. I say almost because there are always unusual circumstances that can throw pH off. If your water supplies pH has drastically changed for some reason it may cause a problem.

So when to adjust soil pH ? The time to adjust soil pH is when you see a problem! The problem will be nutrient lock-out. You can see when you use the wrong soil with too much peat and no dolomite. When you use a good soil this does not happen in the vegetating stage of your crop because your organic soil will be able to buffer the pH to a proper level. For the above reason is important to re-pot.

Read Article: When and How to Repot?



Nutrient lockout in the flowering stage, growth stops – the leaves tips turns backwards, exactly the same as when you overwater – but the leaves turn yellow.



Nutrient lockout on seedlings: none of the plants did grow they became thinner and thinner, white till they completely dried up

But as time goes on and watering has flushed out some of the buffers effectiveness, a pH problem is possible. This will usually happen in the flowering stage and the tell-tale signs are :” All growth stops ! The plants begin turning an ugly dull yellow. The flowers become miniaturized with the growth stoppage.

The biggest problem: by the time you realize you have a problem with pH it will most likely be too late to save the plant. One reason for this is it’s very easy to misdiagnosis the problem at first and try other methods of correction. The first signs of pH nutrient lock-out mimic other deficiencies such as “nitrogen” deficiencies, “iron” and “magnesium” deficiencies.

Plants are very difficult to save and generally it is not worth it, if you are in the vegetative stage try to let the plant rest: indoor it is not worth, outdoor leave the plant in shadow, never water, then give her a the first hours of the morning sun ONLY and eventually it will recover in 3-4 weeks and the same older plant will then thrive in the same soil. It is not the plant that recovers but the **Mycorrhizal fungus** [**see at the end of this page**] that develops, and the plants needs to be in shadow or it would dry up as the roots are not able to service the plant.

BEFORE ADJUSTING SOIL PH WHAT YOU NEED TO KNOW !

There are three measurements that are important to know before you attempt to correct a soils pH problem.

1. The pH of your water supply,
2. the pH of your water after adding any nutrient solution, fertilizer or supplements,
3. and your soils pH value.

Checking your water and nutrient solution is very easy with a good pH meter or a good test kit. Checking the pH of your soil isn't as easy as it requires a little math.

Testing Your Soils pH !

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You could buy a metal probe meter and use that if you want a ballpark figure, but for our purpose, that meter is not precise enough or accurate enough. I guarantee you will be disappointed with one of those meters for I have tried many manufactures products and found them all to be lacking on accuracy.

If you are serious about growing marijuana it is worth to spend the money and buy a good pH meter.

A good meter should cost at the minimum 30 EUR, and most cost more, but are well worth the cost for their accuracy. Keep in mind you get what you pay for.



This is a professional item

This is not sufficiently precise

Two Ways to Test Soil.

The first way to test soil is to put some soil in a mason jar and add distilled water (its pH is neutral) at a ratio of two parts water to one part soil. Shake it up and let it stand for a half hour or longer. Measure the pH of the water after this time has passed and all solids have settled. With organic soil you will have floaters of organic material so filtering the water through a coffee filter would be a good idea. Check the pH with your meter. This method is

difficult to utilize with potted plants because the plants roots get in the way of your soil sample and is best used before any plants are potted in it.

TESTING POTTED PLANTS – THE RUNOFF TEST

The second method is by measuring the water that runs out the bottom of the pot after watering a plant. This method requires that you first know what the pH of your water is that you are going to water your plant with. Once you know that pH number write it down **phIN**. With a tray under the plant you are going to water, water the plant. Water the plant well until the tray you put under the plant overflows. A tray 2-3cm deep is perfect. Take a pH reading of the water in the tray **phOUT** and use the following formula:

$$ph = phOUT - \frac{phIN - phOUT}{2}$$

We call this runoff water and so we call this method of testing the **Runoff Test**. [Click for detailed Description](#)

How To Adjust The pH Of Organic Soil In A Potted Plant ?

The best way to correct a soil pH problem is by adjusting the pH of the water you use to water your plants with. This will assure even distribution of pH throughout the pot. Dissolve the lime in the water keeping track of the waters pH. You may also use pH up or pH down products *if they are organic*. To lower pH you may also use *organic vinegar* or organic lemon juice. Try and not change pH drastically in one application as a drastic change can do more harm than good. Change it slowly with your watering and only water when your plants are ready for water to prevent over-watering and root rot. I have never had to raise my waters pH but I do have to lower it on occasion and always when I do clones. I use organic vinegar, just drops at a time in a five gallon bucket of water. I use organic vinegar because it's cheap, it's easy, it goes a long way and it's safe.

PH and Cloning !

Clones are very particular about water pH. If the waters pH you used in your rooting medium is too high or too low your clones will not root. The best pH for rooting clones will depend on your rooting medium. Rooting in soil pH should be around 6.5 to 7 pH. Rooting in a soil-less mix, rock-wool or sphagnum cubes pH is best between 5.5 and 6.5 pH. Adjust the waters pH prior soaking the soil-less medium, rock-wool, sphagnum

cubes, peat cubes etc. for 24 hours. Keep watering your medium with the proper pH water as needed.



Before cloning Always stabilize the pH of the propagating medium

A word about Arbuscular Mycorrhizal Fungi and pH

Up to 10 years ago [2007] – Growing books use to simply state: when growing organic, you do not need to care about the soil pH. This is true if the Arbuscular Mycorrhizal Fungi are already developed and if you are growing in humus that already has developed the fungi. The now popular Supersoil is nothing but humus.

This kind fungi and the chemistry that allows plant to grow in an environment with “crazy” pH value were discovered in the last 10 years.

Arbuscular mycorrhiza fungi occur in all terrestrial environments including soils with varying pH from as low as 3 pH to as high as 9.5 pH. **They are the reason plants can live in soil with extremes of pH.** As you can imagine there are very few plants that can survive at the extremes of this range. Most plants grow in soils with pH of 4.5 to 8.0. While mycorrhizal fungi have preferences regarding soil pH, they are not absolute, and different species have different preferences.



There is published research showing that *Mycorrhizal fungus* plants and mycorrhizal fungi can modify the pH of their root environment. Bulk soil may be outside the preferred pH range for a plant, but the mycorrhizal fungi can surround the roots with a more tolerable pH environment. Some mycorrhizal fungi can produce a tightly woven sheath wrapped around a plants roots. The pH inside the sheath can be at or near the optimum pH for root growth compared to the pH of the bulk soil. This protection of the root by the fungal sheath can allow trees to grow in extreme places, such as abandoned coal mine areas.

The Bottom Line – pH and Marijuana

When growing marijuana, pH and marijuana go hand in hand. It is much easier to prevent a pH problem than it is to correct a pH problem. **To prevent pH problems incorporate some Dolomitic lime into your soil mix before planting.** *Do this even with store-bought commercial organic soil.* If you do this, you will prevent almost all pH problems from happening. If you grow commercially check your waters supply pH periodically, at least once a month. The perfect **soil pH** for marijuana is 6.5, and a good range is 6 to 7 pH.

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