

GROWERTALKS

Features

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Choosing Fertilizers For Plug and Liner Production

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When looking at fertilizing your plug and liner crops, the options are endless. In order to decide the best option for your crops, you need to evaluate all of the factors that can affect the uptake of the nutrients into the plants. You need to consider your water quality and soil, as well as the nutrients that your specific crop requires.

One of the most common strategies to managing fertilizer within your greenhouse is to utilize a balanced feed that works best with your situation as a normal feed, and spot feed with some of the more specific blends of fertilizers. The most commonly used routine fertilizers in plug and liner production are 20-10-20, 17-5-17, 13-2-13 and 15-5-15.

Irrigation water alkalinity and pH

More than pH, the alkalinity of your water has one of the largest impacts on the long-term pH of the soil of your crop, as well as the availability of nutrients to your plants. Alkalinity is defined as the ability of a solution to neutralize acids to the equivalence point of carbonate or bicarbonate. In other words, it's a measurement of how much acid is required to lower the pH to a specific level.

Without any alkalinity, your substrate will tend to swing quickly from one pH to another, depending on the fertilizer source. Too high of an alkalinity will make it very difficult to maintain a lower pH level within the substrate. The ideal range for alkalinity is between 80 and 120 ppm. By maintaining this range, you can still affect the soil pH with your fertilizer, but the soil is buffered by the alkalinity to avoid the wild swings.

When your water source has alkalinity levels below the recommended range, consider adding additional limestone to your substrate either in the mixing of the soil itself or as a drench during the crop cycle. When your water source has a very high alkalinity, you should consider adding acid to your irrigation water to bring your ppm down to an acceptable range. Depending on the quality of the water, the amount of limestone or acid will vary and must be dialed in specific to your situation.



Effects of pH on availability of fertilizer

The pH of your soil has a tremendous effect on the plant's ability to pull nutrients out of the soil. Although you may have plenty of fertilizer in the soil, the pH could allow the bond between the nutrient and the soil to be stronger than the plant can handle. If this happens, the plant cannot grab and utilize the nutrient. The opposite is also true—at a certain pH, the ability for a plant to utilize nutrients in the soil greatly increases. If you continue to add a balanced fertilizer to your soil when you see a nutrient deficiency, you may end up with toxicity from another element before you can ever correct the deficiency. It's very

important to monitor the pH of the soil and determine what course of action you really need to take.

Low pH levels will result in high availability of iron, manganese and aluminum. At the same time it makes the availability of calcium, magnesium, sulfur and molybdenum decrease. At high pH levels the result will be lower availability of phosphorous, iron, manganese, zinc, copper and boron, and much higher availability of calcium and magnesium. What is a deficiency within a plant may not be due to a lack of the nutrient, but the pH making it unable to be used.

Fertilizer and the ability to affect pH

Depending on the components of a fertilizer, the fertilizer can tend to affect the pH of your media. Ammonium nitrate, ammonium sulfate and diammonium phosphate are acidic and will tend to lower the pH of your media. Calcium nitrate, sodium nitrate and potassium nitrate are basic and will tend to raise the pH of your soil.

All fertilizer bags will list the potential acidity or basicity of the product. The acidic residue of any fertilizer in the soil, measured in terms of calcium carbonate required to neutralize it, is called potential acidity. Likewise, the basic residue of any fertilizer in terms of its calcium carbonate equivalent is called the potential basicity of that fertilizer.

If you are struggling to keep the pH down in your crops, you will want to look at applying a fertilizer with a fairly high potential acidity. Some of the more common fertilizers for this are 20-10-20 and 21-7-7. If you're struggling in the opposite direction and need to raise the pH, try utilizing a more nitrate-based feed with a higher potential basicity like 15-5-15 or 15-0-15.

Unfortunately, the effects on the plant growth of the different types of fertilizers are very different. The feed that will typically lower your pH is going to give you a lot of leafy and soft top growth to your plants, with less emphasis on root development. The feeds that typically raise your pH are going to give you a stronger, more compact growth with emphasis on the roots. Make sure that adjusting your pH by changing your feed is not going to change the total crop time or appearance of the plants.

So what to do?

Because there are so many specific details to all of the crops that we grow, it's recommended to keep our pH between 5.5 and 6.5. This allows for the maximum overall availability of all of the nutrients that we need to

supply our plants. To make the most out of our fertilizer, it's best to first balance the pH of the soil that we're going to be using.

Most premixed soil is already ready for us. From there, adjust the alkalinity of your water if needed to get your alkalinity between 80 and 120. After that, you can use the feeds available to make the subtle changes to the pH that we need, as well as deliver the specific nutrients that our individual crops require. Utilizing 17-5-17 and 13-2-13 to make very subtle changes up and down while using 20-10-20 and 15-0-15 will make more dramatic changes to both pH and the structure of the plant. **GT**

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