

## High Tech Versus Low Tech

**Your preferences, skill level, free time and budget should determine what type of planted tank to keep.**

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Planted tank enthusiasts have a lot of choices to make when they begin setting up a new planted tank. The biggest question is often centered around choosing whether to keep a “high-tech” or “low-tech” setup, the biggest difference generally being whether CO<sub>2</sub> will be injected or not.

I personally don't think this is the most useful distinction we can make in setting up planted aquaria, because of certain ambiguities in defining what is actually high- or low-tech. For the most part, your setup should be planned out based on your preferences, skill level, your overall budget and the amount of free time you have.

### Choosing Your Tech

If you are trying to decide whether you want to go high- or low-tech – and by that I mean, if you are trying to decide whether to inject CO<sub>2</sub> or not – consider the following: This is not a question of how “good” your aquarium setup will be. There are excellent planted tanks that use injected CO<sub>2</sub>, and there are excellent planted tanks that don't use injected CO<sub>2</sub>.

The whole point of adding CO<sub>2</sub> is to increase plant growth rates and to potentially increase the “robustness” of your plants. Keep in mind, however, that this isn't a linear relationship. As plants grow bigger, their lighting and CO<sub>2</sub> requirements will change.

What you think you want when you start your planted tank might change, after you find you have to prune your setup almost daily when you supplement CO<sub>2</sub> with a high-tech setup.

Also, keep in mind that there are different methods of adding CO<sub>2</sub> to the aquarium. Arguably, the high-tech method is limited only to injected CO<sub>2</sub> coming from a cylinder of compressed CO<sub>2</sub> gas. You can also use fermentation systems or even additives that increase the bio-available organic CO<sub>2</sub>, such as Excel.

There are advantages and disadvantages to the various methods. I don't particularly care whether a certain method is considered high-tech or not, and I also don't have any preconceived ideas about what method is best in all cases.

### Preferences

You should select your method of CO<sub>2</sub> injection in part based on your preferences and goals for your system. Do you want fast, dense plant growth? Consider an injected CO<sub>2</sub> system. Do you have a smaller aquarium or do you just want to experiment with supplementation to see where it takes you? I would look into setting up a do-it-yourself fermentation system.

Maybe you actually want to stop adding CO<sub>2</sub> in its gaseous form, because your tank is mature and you don't want to have to prune your plants as often, but you still want encourage robust growth. A bio-available organic CO<sub>2</sub> additive might be your best option in this scenario.

### Skill Level

You also have to consider your own expertise before you begin with CO<sub>2</sub>. If you aren't familiar with injected CO<sub>2</sub> methods, you absolutely must do your homework and figure out how you are going to set up your system.

There are many options when it comes to injected CO<sub>2</sub> systems. How are you going to disperse the CO<sub>2</sub> into your setup? What method are you going to use to diffuse it into the water column, making it available to plants? Are you going to use a reactor, a diffuser or some other method to put the CO<sub>2</sub> into the water column? How are you going to monitor CO<sub>2</sub> levels and pH?

You have a lot of options even within the high-tech framework. Going low-tech may simplify things a little, but you still have to know how you are going to get the CO<sub>2</sub> into the water column, how you are going to keep it there and how much you want to make available to your plants.

### Overall Budget

In my opinion, high-tech planted tanks are the freshwater equivalent of reef aquaria. They require additional knowledge of water chemistry, gas exchange, plant care and, most importantly, time and money.

Going high-tech may look like a great option, and it might be the best solution for you based on your goals, but you might find it just costs too much to set up the way you want.

Injected CO2 systems, including a gas cylinder, a regulator with solenoid, a method of diffusion and other related equipment will cost money. There isn't any way around this, unless you happen to have spare regulator parts or an extra CO2 bottle lying around.

Most of us don't have these things on hand, however, and we'll need to purchase them to begin. Of course, these items definitely confer an advantage, and if you can afford to drop the money on a nice, prepackaged CO2 setup, by all means go for it.

But if your budget is limited, or if you don't want to allocate a large portion of it to the high-tech aspects of your setup, you should consider going low-tech. If cost is a big consideration for you, look into alternative CO2 injection methods, or just decide to go "ultra" low-tech and avoid adding CO2 altogether.

#### Free Time

Planted aquarium keeping is a hobby, and you should keep that in mind when you are designing your high- or low-tech setup. Even if you have a certain high-tech-oriented goal in mind, and you have the resources and expertise, you might find you just don't have time to spend hours working on your planted tank each week.

Injecting CO2 will make your plants grow faster, as long as you've taken care to provide correspondingly higher light levels and, to a much lesser extent, adequate macro- and micronutrient levels. As your plants grow, you will have to prune them and manage them more. You might have to replant as they grow, because certain plants might shade others in the aquarium, or the growth patterns might not be what you want. Maybe you want to change your setup because you don't like where (or how) it's growing.

In any case, a high-tech planted tank will likely require more of your time than a low-tech planted tank will. It's great to be enthusiastic about a setup, and I love to plan out intricate planted tank designs, but keep an eye on the real time and labor requirements you are building into your setup. I guarantee you'll be glad you did.

#### Which is Better: High- or Low-Tech?

To answer this question outright, it is totally up to you and your goals. Every method of adding CO2 to your aquarium has its benefits and drawbacks. No single method is always going to be right for you. You might have to change methods, or even use multiple methods at the same time, depending on what you want to accomplish.

I definitely encourage you to try all the different methods if you can afford to invest the resources. But remember that your goals might change as your plants grow and change. This is a fluid hobby, after all, and you never know precisely what you'll find while you're a part of it.

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