

Understanding Fertilization

By Amanda Matthews



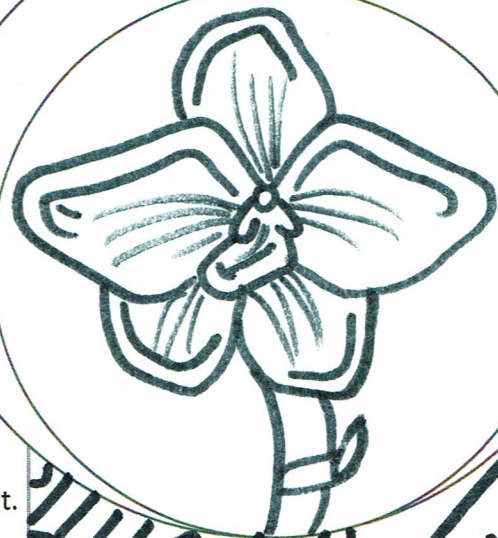
Understanding Fertilization

Orchids don't thrive on water and sunlight alone. In their natural habitat, orchids receive nutrients from the overhead leaves which form a canopy above them. Nutrients floating in the air fall onto to their roots and provide them with extra minerals that keep them healthy.

In our home environments, this is harder to achieve, but can be done using fertilizer.

Orchid fertilizer is not orchid food, since orchids photosynthesize their food from the interaction of chlorophyll and sunlight. Many producers advertise their fertilizers as food, but what fertilizer does is supply extra minerals that can aid rapid and healthy growth.

Knowing how to pick the best fertilizer for orchids is essential to growing orchids. You'll need to look at one specific item, which is composed of a three-part number separated by dashes. This number is called the N-P-K ratio, and is the balance of three nutrients which make up the fertilizer. Each one will promote a specific quality in your plant, so picking the right one is essential. Before we explain each one, let's look at what fertilizer is and isn't.





Basic Orchid Fertilization Information

It is important to note that orchid fertilizer is not a miracle—unlike one brand name suggests. Nutrition doesn't come from fertilizers, but from photosynthesis and

- sun / light
- water
- humidity

Orchid fertilizers will aid in speeding up the natural process of the orchid, inducing the production of chlorophyll, stimulating leaf growth, and aiding in conditions that the orchid already is living in. So if you aren't providing enough light and the right humidity, then fertilizing will not help much.

One common mistake that new orchid growers have is that fertilizers are used as plant medicines. "Oh, my orchid is yellowish-green. Let's add a fertilizer." Band-aid type treatment is not proper fertilization.

In this aspect, use fertilizers to stimulate a healthy plant, not cure a dying one.

Putting the N-P-K Ratio into Practical Terms

Let's put into practice what you already know. Look back to the numbers on the orchid fertilizer label, or the N-P-K. Using an example, let's say it's 5-10-10. That means that the percentage of each item are:

- nitrogen is 5%,
- potassium is 10%
- phosphorous are 10%

Into practical terms, you'd use this fertilizer when focusing less on leaf production and more on flowering and root stimulation.

Phosphorous and potassium are found in higher quantities in lawn soil, so most fertilizer producers focus on giving the public higher rates of nitrogen. If you have been reading the articles on this site, you'll already know that orchids don't grow in soil (well, the majority don't, called epiphytes).

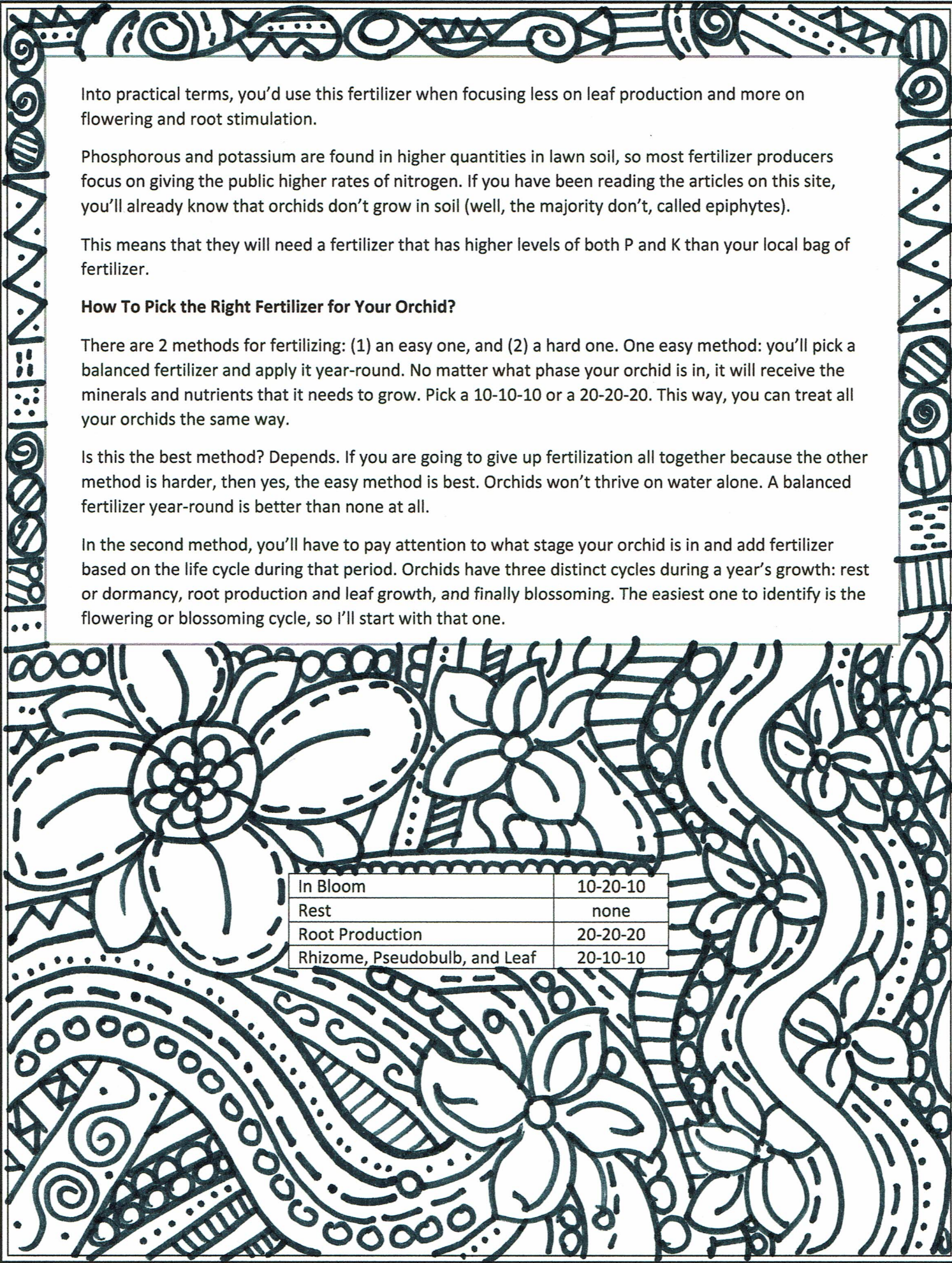
This means that they will need a fertilizer that has higher levels of both P and K than your local bag of fertilizer.

How To Pick the Right Fertilizer for Your Orchid?

There are 2 methods for fertilizing: (1) an easy one, and (2) a hard one. One easy method: you'll pick a balanced fertilizer and apply it year-round. No matter what phase your orchid is in, it will receive the minerals and nutrients that it needs to grow. Pick a 10-10-10 or a 20-20-20. This way, you can treat all your orchids the same way.

Is this the best method? Depends. If you are going to give up fertilization all together because the other method is harder, then yes, the easy method is best. Orchids won't thrive on water alone. A balanced fertilizer year-round is better than none at all.

In the second method, you'll have to pay attention to what stage your orchid is in and add fertilizer based on the life cycle during that period. Orchids have three distinct cycles during a year's growth: rest or dormancy, root production and leaf growth, and finally blossoming. The easiest one to identify is the flowering or blossoming cycle, so I'll start with that one.



In Bloom	10-20-10
Rest	none
Root Production	20-20-20
Rhizome, Pseudobulb, and Leaf	20-10-10

Blossoming Cycle: What Fertilizer to Use?

During the flowering cycle, the orchid has used up almost all its energy to put out a flower spike. The main goal for any orchid is to reproduce, and flowers only exist to attract pollinators. Each orchid specializes in one specific type of pollinator, unlike other plants which are perfectly happy to attract bees, hummingbirds, moths, butterflies, wasps, and other many insects.

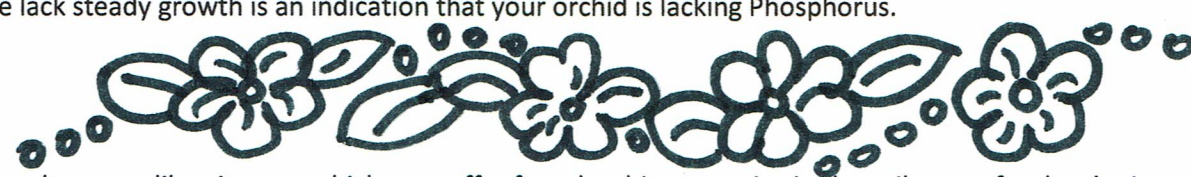
During flowering, the orchid will need a fertilizer that is **high in Phosphorus**, the second number in the N-P-K ratio. Phosphorous will concentrate on the development of **healthy roots, seeds, and flowers**. Its reproductive cycle is the target, as phosphorus will concentrate on propagating its species.

Look for fertilizers that have a **10-20-10** ratio, where the second ingredient, Phosphorus (P) or Phosphate (P2O5), is the highest compared to the others.

TIP: Fertilizers are always a N-P-K proportion: if you give a balanced fertilizer, where all the numbers are the same (which in itself isn't wrong,) then you won't be enhancing the particular needs of your orchid, at that specific time.

If the plant lacks phosphorus, it might become a bit "purply" colored instead of rich, luscious green with hints of yellow. Growth will be tardy and underdeveloped, compared to other plants that grow like weeds.

The lack steady growth is an indication that your orchid is lacking Phosphorus.

A decorative horizontal separator featuring a series of stylized flowers and leaves. The flowers have five petals and are interspersed with elongated, pointed leaves. The entire design is rendered in a simple, black-and-white line-art style.

Phosphorus, unlike nitrogen which can suffer from leaching, remains in the soil even after hard rains and constant watering. It can become too concentrated quickly. This builds up residue in your potting medium. Every two weeks, or once a month, rinse out your potting medium to rid the excess fertilizer that has built up. You can tell if there is salt residue by a sparkly-white glisten on the top of your potting medium.

In high quantities, phosphorous is not beneficial for any plant and downright harmful for humans. That is why many states (in the USA) have issued concerned for fertilizing with phosphorous in large fields, as the rain water might transmit these high doses and contaminate rivers, streams and other waterways.

Some producers say that during the active bloom, you don't need to add any more fertilizer. In fact, you can cut it down to half or none. The orchids aren't in a growing stage, no matter what the label on the fertilizer says. I prefer to add a flowering fertilizer, rich in Phosphorous. But to each his own... They do have one point though: you can lessen the dose.

When an orchid has flowers, it is concentrating on pollination and reproducing its species. All its efforts will be in attracting pollinators, stunting growth everywhere else. There is no dynamic development in the plant in terms of stem, flower spikes, or new leaves.

Second Cycle: Dormancy or Rest

After the blooms have fallen off, the orchid will retract into a period of rest. Some orchids have a longer period, where all the leaves will drop and they'll look half-dead, while others are hardly noticeable, there so fast. Phalaenopsis orchids actually have no dormancy period. They just kick back in and start to produce roots.

Do I fertilize my orchid all year round?

In short, no. During the orchid's life cycle, there are times to increase fertilization and other times to halt it completely.

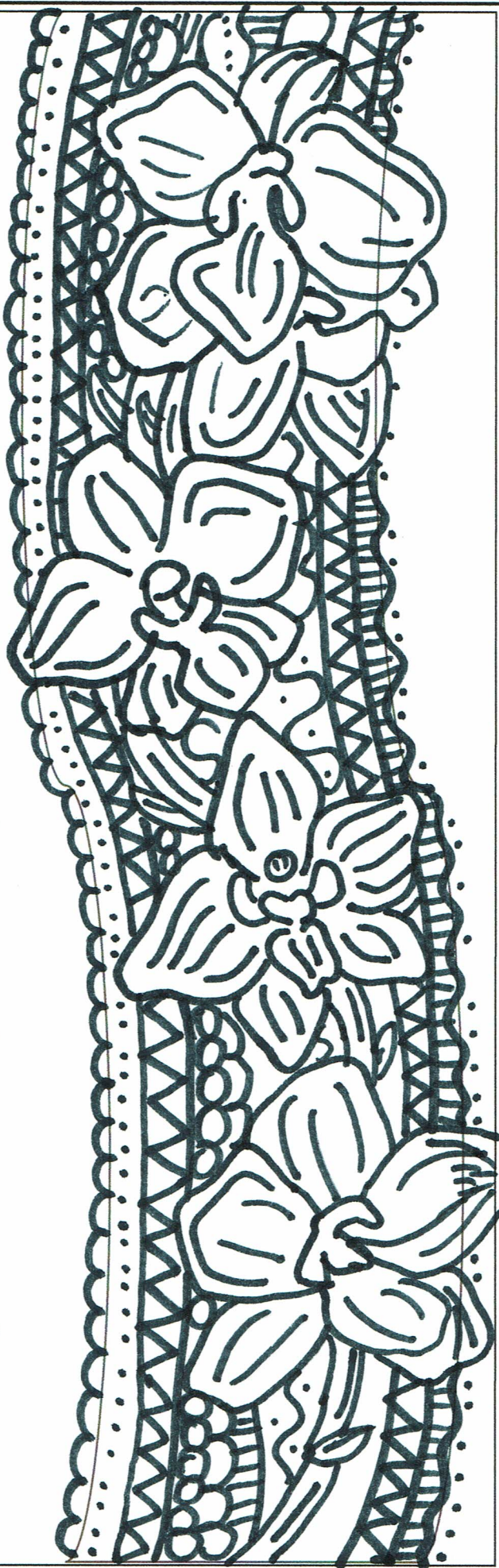
During growth periods, when you see new leaves appear or a new flower spike shoot out from in between the leaves, upgrade the fertilization. This is the best period to invest in fertilizer and ensure that it has enough nutrients and added minerals to produce new flowers, roots, and stems.

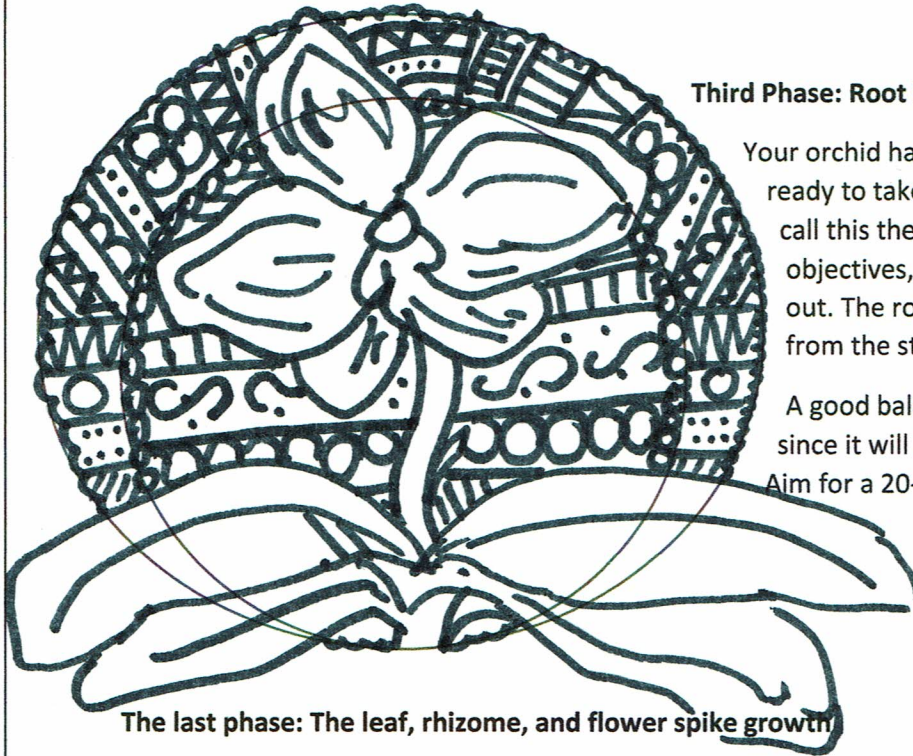
But the contrary is true for dormancy. During this rest period, you need to cut back on everything, and I mean everything. Tune down the lights, half the watering, and drop the fertilizer. Some people even place their orchid in the dark garage, where it's cooler. I personally don't since I have a tendency to forget things. I'd find my orchid three years later, quite dead. Anyway... Your orchid won't be absorbing any of these things and just providing them is putting them at risk.

The risk for water is root rot. Since the roots won't be absorbing the water at a rate that they were before, the water you provide will stay longer inside the potting medium, provoking media decay. It also promotes root suffocation, which will lead to root decay. Keep watering your orchid, but do so in less quantity until you see new roots.

Tip: this is an excellent time to repot.

Each orchid will have a specific dormancy period, so you'll need to check your genus and species and see how long to hold back. Another way to see if the orchid is "coming back to life" is when you see new roots sprouting from the stem or new growth anywhere on the plant. Don't use any type of fertilizer during this period.





Third Phase: Root Production

Your orchid has now come out of dormancy and is ready to take on a new phase of its life. You can call this the "new year" for your orchid, with new objectives, goals, and lots to do from here on out. The roots will be the first to grow, sprouting from the stem or rhizome.

A good balanced fertilizer is best for this period, since it will be the longest period of your orchid. Aim for a 20-20-20 without urea.

The last phase: The leaf, rhizome, and flower spike growth

This is the most active time of growth, and your orchid needs all the extra nutrients it can get. Aim to get a high Nitrogen concentration in your fertilizer, such as a 20-10-10.

The first number in the N-P-K ration represents how much nitrogen(N) is in the fertilizer.

Nitrogen is responsible for the rich, luscious green color in the leaves and spike. When used in lawn or plant fertilizers, nitrogen will promote healthy, rich green leaves. If given too much, the plant will forfeit flowers, fruit, and roots, focusing wholly on leaves. If your orchid lacks nitrogen, the leaves might turn a yellowish-green color, in contrast to the vibrant green.

Nitrogen (N) is part of the air we breathe, and moves around easily/freely in the potting medium as it does in soil. When watering, nitrogen is usually washed away. The loss of nitrogen is called leaching.

When looking at a bag of orchid fertilizer, you might not see the word nitrogen, but nitrate or ammoniacal nitrogen. Both these are the same—well, for us. Chemistry majors will disagree.

In any case, your orchid needs a fertilizer that contains nitrogen, but not much over the number (which is a percentage) of 20.

Stay away from urea nitrogen. We'll explain why later on.

What about K(Potassium)? What does it do?

The last ingredient in the N-P-K ratio is potassium (K) or potash (K₂O). Potassium is an overall well-being of the plant, as it helps the orchid fight off pests and disease. Potassium will enhance the orchid's resistance to drought, heat, and cold. This is why we call potassium the natural defense.

It does encourage root growth and also leaf production, but not as much as the first two minerals.

What else is in Fertilizer?

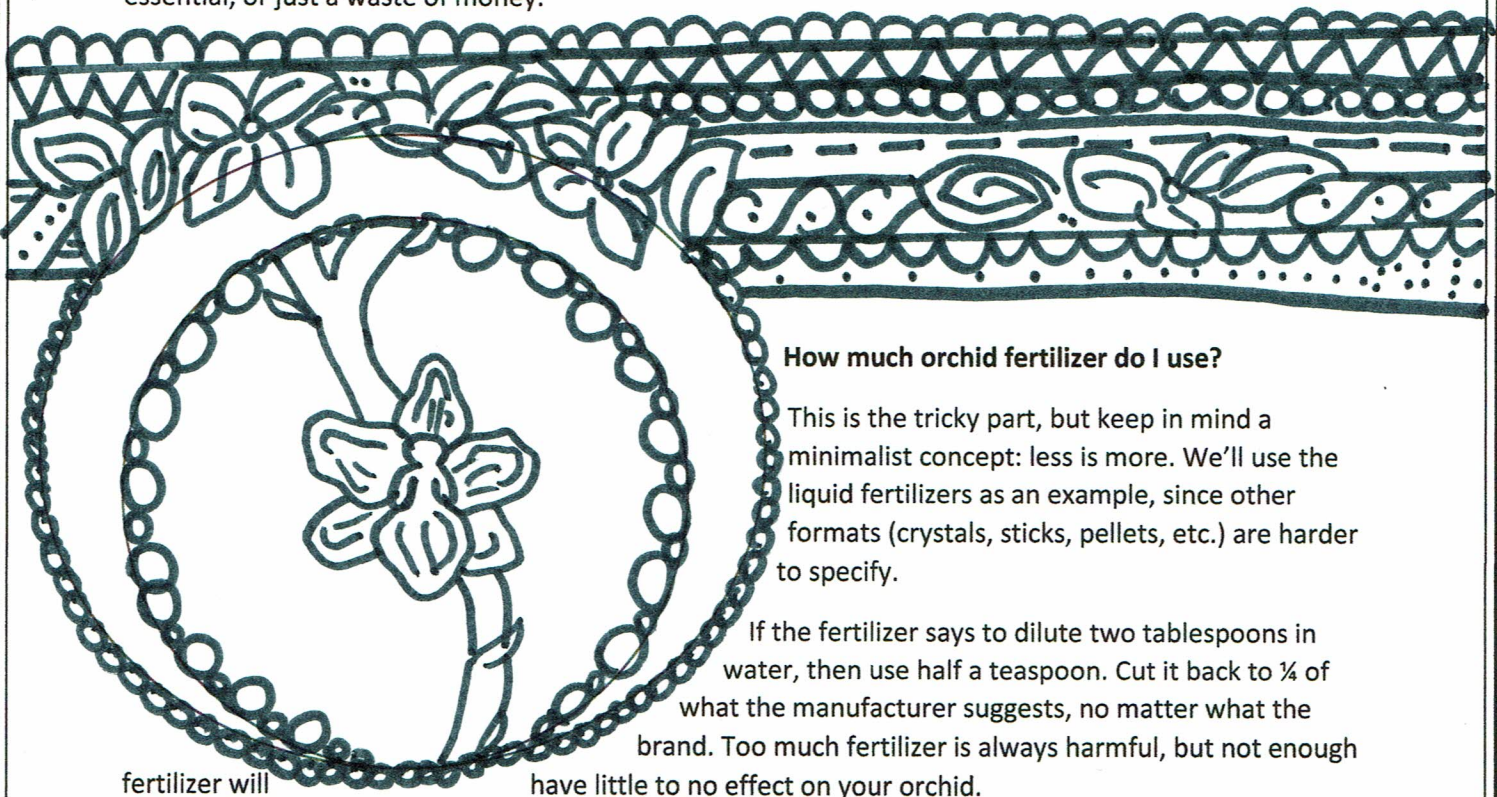
You'll notice that not all fertilizers add up to 100%. In fact, none do. For example, even our best fertilizer with a 20-20-20 ratio hits the 60% mark.

What's in the other 40%?

There can be an additional number of other macronutrients, such as: magnesium, calcium, iron, nickel, sulfur, boron and chlorine. There might be some micronutrients as well, such as: copper, carbon, hydrogen, oxygen, and zinc.

When it comes to epiphytes, you won't need to worry about some of these micronutrients. For example, hydrogen, carbon, and oxygen can all be found in the air.

Why pay more for that? Check the ingredients of the orchid fertilizer carefully to see what is beneficial, essential, or just a waste of money.



How much orchid fertilizer do I use?

This is the tricky part, but keep in mind a minimalist concept: less is more. We'll use the liquid fertilizers as an example, since other formats (crystals, sticks, pellets, etc.) are harder to specify.

If the fertilizer says to dilute two tablespoons in water, then use half a teaspoon. Cut it back to $\frac{1}{4}$ of what the manufacturer suggests, no matter what the brand. Too much fertilizer is always harmful, but not enough

fertilizer will

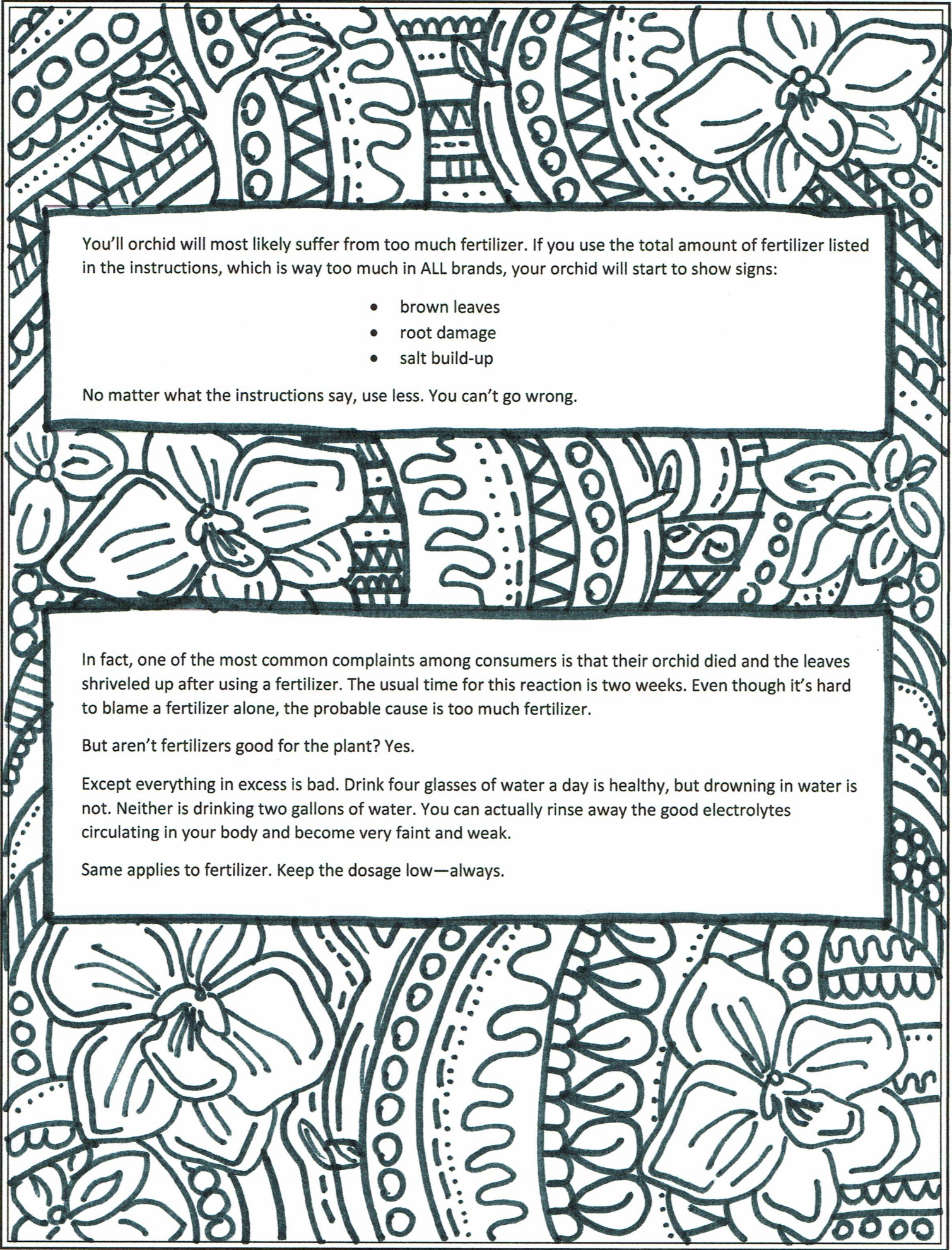
have little to no effect on your orchid.

Why do manufacturers do this?

Well, first, they don't know how big your orchid is. Do you have a massive 10-year old orchid with several shoots, stems, and flower spikes? Probably not. Your orchid is most likely small, and planted by itself in the pot.

Another point to ponder: fertilizer manufacturers want to sell their product. By using up your product in higher quantities, you'll run out faster and have to buy more. So why not suggest to use more than normal? From a strictly financial perspective, they can't go wrong.

But you can.



You'll orchid will most likely suffer from too much fertilizer. If you use the total amount of fertilizer listed in the instructions, which is way too much in ALL brands, your orchid will start to show signs:

- brown leaves
- root damage
- salt build-up

No matter what the instructions say, use less. You can't go wrong.

In fact, one of the most common complaints among consumers is that their orchid died and the leaves shriveled up after using a fertilizer. The usual time for this reaction is two weeks. Even though it's hard to blame a fertilizer alone, the probable cause is too much fertilizer.

But aren't fertilizers good for the plant? Yes.

Except everything in excess is bad. Drink four glasses of water a day is healthy, but drowning in water is not. Neither is drinking two gallons of water. You can actually rinse away the good electrolytes circulating in your body and become very faint and weak.

Same applies to fertilizer. Keep the dosage low—always.



Important: Do not apply fertilizer to dry roots.

Dry roots are thirsty and avid absorbents. They will more than likely soak up excess quantities of pure orchid fertilizer, causing extensive root burn. Let the roots refresh themselves with a good dose of water. After they turn into that vibrant green color, we all love and adore, then feed them with $\frac{1}{4}$ of the dose of orchid fertilizer.



Can I apply the different fertilizers year-round to all the plants?

No. You'll have to keep track of each plant separately. Some orchids will bloom during summer, others during winter. Summer bloomers will prefer more fertilizer during their winter months than a winter bloomer will. Other lucky species bloom twice a year, so you'll need to keep fertilization constant.

After the flowers fall off and the flower spike drops, most orchids will go into a dormant period. If you decide to cut the spike leaving two or three nodes to induce rebloom, then continue the fertilization, since this will stimulate it to keep producing new growth.

If not, when you cut back the flower spike to the nearest node next to the base, growth will halt and the orchid will go dormant. These next few weeks up to a few months you can use less fertilizer.

Fertilizer Supplements: Is Epsom Salt Good for Orchids?

Orchid fertilization is not a complicated subject, but the more you immerse yourself in the different possibilities, the more fascinating it gets. Well, at least for me... I once thought that fertilizing with a balanced fertilizer, 20-20-20 year-round was sufficient. Then I read about not using one with urea nitrogen in it. Then the question came up about using Epsom Salt for fertilization. In all, is Epsom Salt good for orchids?

Epsom salt is extremely beneficial for your orchid's maintenance and nutrition. Not only does it help with the production of chlorophyll, it aids in cell construction, proper hydration, and flushes out the orchid from salt residue. Epsom Salt will make the blooms larger and the leaves more vivid, causing no harm to your orchid.

With the use of Epsom salt, there have been many questions about its use and exactly what it does. This article will explain how and where Epsom Salt will make your orchid more beautiful and healthier than ever. Along with Epsom Salt, I've included iron and calcium in the article, since many products on the market also include those.

A good source of Magnesium is Epsom Salt, since it is made from Magnesium Sulfate. To use Epsom Salt, you need to mix one tablespoon in a gallon of water and let it dissolve (The Epsom Salt company suggests two tablespoons, but every forum I've ever asked, the answers said they use only one.)

Mix it well. Soak your orchid roots in the mixture for anywhere from 10 minutes to three hours. I was skeptical at the three hours tutorial I read, but these orchids were extremely dehydrated. This is a test you need to do and see what time is most beneficial for your orchid.

Use this solution four times a year or for every third or fourth watering. This solution will flush out your orchid, ridding it of excess fertilizer.

How Does Epsom Salt flush out Salt residue?

Epsom salt is not exactly a salt. That is what stumped me for the longest time. It's just a mineral composite of Magnesium and Sulfate. According to their homepage, "Magnesium plays a number of roles in the body including regulating the activity of over 325 enzymes, reducing inflammation, helping muscle and nerve function, and helping to prevent artery hardening. Sulfates help improve the absorption of nutrients, flush toxins, and help ease migraine headaches."

Of course, this is for humans, not orchids. Yet numerous orchid growers have used Epsom Salt in between watering and the overall consensus was that the leaves were bigger, brighter, more luscious, and the blossoms were noticeably superior.

What does Iron Do For Orchids?

Iron does not aid the plant specifically, but it helps produce chlorophyll. A deficiency in iron will negatively influence in how much chlorophyll will be created, and induce what we call chlorosis. Without chlorophyll, your orchid cannot take the light it is receiving and transform that into energy.

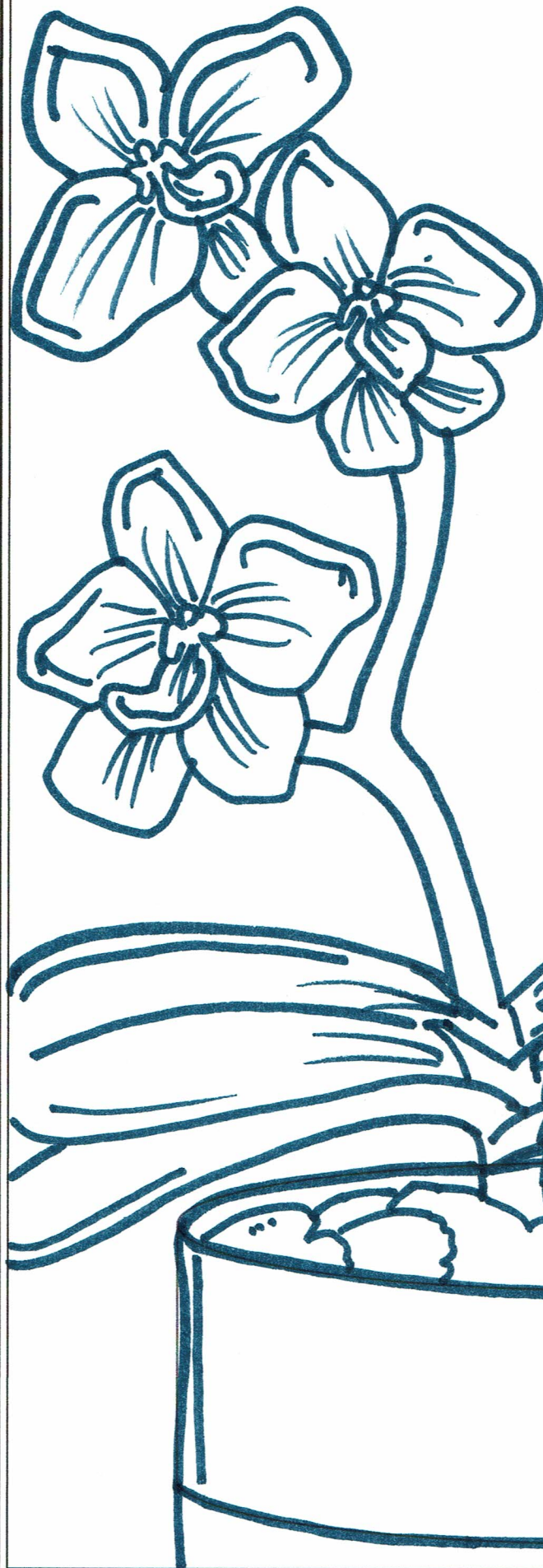
Chlorosis is not only caused by lack of iron. If you are overwatering and have been for some time, root rot will set in, and this also causes chlorosis. Before you add more iron to your watering schedule, make sure that the roots are in good condition and capable of absorbing the iron.

What Does Calcium Do For Your Plant?

Calcium is a macronutrient and extremely important for your orchid. Your city's water supply usually adds a small percentage of calcium to the water already.

Calcium enters the orchid through the roots, and travels up toward the stem to where it is distributed through the xylem. This vascular system is not always fluctuating, and once the calcium stays where it needs to be, it doesn't move throughout the plant (like our blood would move through the veins and arteries.)

Calcium has several benefits to your orchid. First, it will maintain healthy cell structure by neutralizing unwanted acidic components.



I thought adding salt was bad for the orchid.

Don't ever, I repeat EVER add salt to your orchid. Epsom Salt is not salt, as explained before. Salt from the kitchen table will destroy your orchid and burn the roots. Table salt is Sodium Chloride (NaCl) and Epsom Salt is epsomite, which broken down is magnesium (Mg), sulfur (S) and oxygen (O).

How Does Magnesium Influence Your Orchid's Growth?

Magnesium is extremely vital for the production of chlorophyll, as is iron. If you water too heavily, magnesium will be washed out of the potting medium, so there hardly is any build-up from "overdosing" in magnesium. On the other hand, if you don't flush your orchid, the magnesium will build up.

Magnesium is absorbed through your orchid's roots and is transported through the entire orchid, unlike some of the other nutrients and minerals we'll talk about below. Since magnesium flows freely through your orchid, if there is a deficiency, the orchid will try to save the newer leaves in detriment to the older leaves. The older leaves will start to turn purple or have splotches of green throughout the leaves.

This means that once the calcium is in place, it isn't supplied to places that don't have it. That is why newer leaves can suffer from lack of calcium, while older leaves be fine. It's common that you'll first notice the calcium deficiency in orchids in newer leaves.

A sign your plant is not getting enough Calcium is when the tips of newer leaves start to turn yellow. The roots will be sprouting by the millions, but they don't grow very long, as the lack of calcium will stunt growth. If your pseudobulbs or leaves look smaller than the previous ones, then a good rule of thumb is that either they aren't getting enough water or they are lacking calcium.

You can take the yellow away from the tip of the leaves, but this will be a slow long process. As you soak your orchid in water, or as you water it, use calcium supplements. It's best to prevent the lack of Calcium than to try to fix it later on, so maintain a regular calcium supplement as you water.

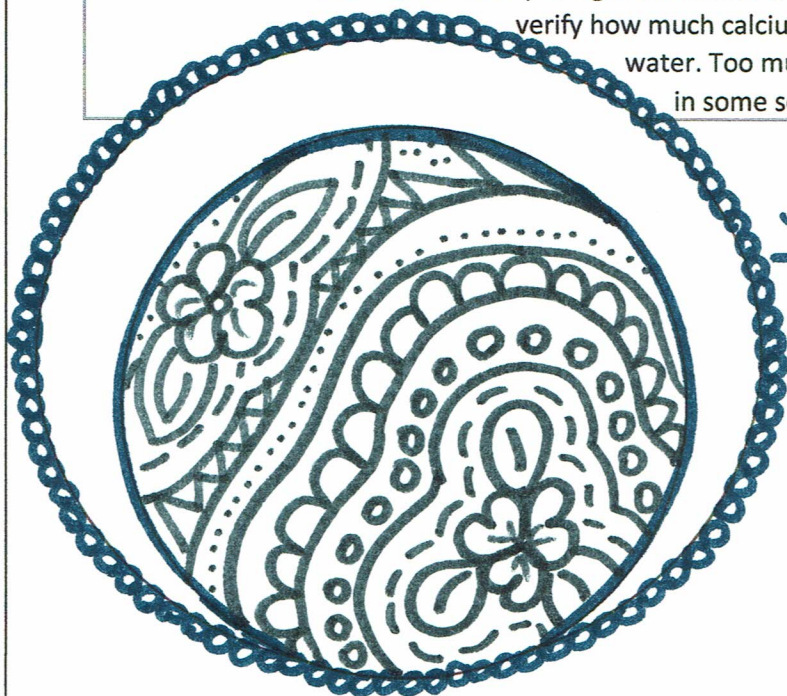
But don't go overboard. If you use too much calcium, and do an extreme overdose in calcium fertilization, the roots will not be able to absorb any other minerals or nutrients. Phosphorus, potassium, magnesium, boron, copper, iron, and zinc will quickly become depleted from the orchid, even if they are very present in the potting medium or in the water. The roots simply won't be able to absorb them.

Does adding extra minerals and nutrients eliminate Fertilization?

You should not eliminate fertilization if you happen to start using another method to increase the levels of Magnesium, Iron and Calcium in your orchid. Fertilizers are made for specific purposes and just watering alone will not provide the right balance that you need.

How much Calcium and Magnesium does your tap water have?

If your orchid looks weak, pale, and just not growing well, you shouldn't just start adding chemicals. First try to figure out what is lacking. You need to check with your city to verify how much calcium and magnesium that are already in your tap water. Too much can be just as beneficial as not enough, and in some scenarios, even worse.



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