

Indoor Plant Bulletin No.18

Repotting

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I answer thousands of indoor plant questions every year. Here is a typical inquiry that I received:

I have a question that I hope you can answer. I have had my Corn Plant for 3 years. It gets great indirect light and always seemed happy. Since it was doing so well I had to repot it about 5 months ago, and things have been going down hill ever since even though it is the same location and lighting is the same. All the leaves on the shorter cane yellowed, browned and are now dead. Now it appears that the larger trunk is slowly going through that same process. I am in a panic as I love this cane and feel bad that I hurt it.

This change all came about after the repotting incident. I bought high quality potting soil and repotted it into a planter much larger than the one I took it out of, could this be a factor? Is it possible that I damaged the roots? The dirt either seems really dry or it stays wet for a long time. Should I feed the plant? Also, there are no drainage holes in the bottom of the new pot...could that be a factor? If so, would it be wise to drill a few holes in the bottom of the pot even if the plant is still in the pot? I didn't put drainage holes in the pot originally since I didn't think the water would go that far down in the dirt.

Any comments and or suggestions would be greatly appreciated.

Thanks,
Kim (Name changed)

Similar inquiries about different repotted plants describe the symptoms and speculate that

something like overwatering or temperature or low humidity is the cause of the problem. Unlike Kim, the questioner often fails to make the connection between the repotting and the start of the plant problems. Even in instances where repotting is appropriate, the repotting is usually done improperly, as Kim did with her Corn Plant.

*UNNECESSARY AND IMPROPER
REPOTTING IS THE SINGLE MOST
COMMON CAUSE OF PLANT FAILURE* –
not overwatering or poor light or pests or low humidity or lack of nutrients.

Why is unnecessary repotting so common with indoor plant owners?

- Plant books, garden center employees, and other experts recommend repotting every spring. That may be a good practice for outdoor potted plants or in the greenhouse, but not in your home.
- Our intuition tells us that if plants come from the earth, then they must prefer to have lots of room to grow. Although this seems logical, in fact, root growth and water flow dynamics are different in pots than in the earth.
- If roots look crowded, then we think that can't be good for them. After all, we don't like to be crowded. However, research has demonstrated that crowded roots produce better foliage growth and more flowers. Repotting often deters new growth and flowers.
- If roots wander out of drainage holes, it must be because they are looking for

more room. In reality, roots grow in all directions inside a pot and if a root or two grow through the drainage holes, it is just a matter of chance, not a search by the roots for more space.

- The plant looks too big for the pot or the plant leans or tips over because the plant is too small. In reality, a plant's root system cannot be judged by the size of the plant. Large plants often have small root systems and vice-versa. A larger pot will rarely stabilize a leaning plant.
- We believe that a larger pot with lots of soil will help a plant grow faster and larger. In fact, soil doesn't make plants grow. Sun, water, oxygen, and minerals do. Soil is nothing more than the medium that carries and distributes those last three. The volume of soil makes no difference in that equation.
- We think the soil is old and needs to be replenished or replaced. It takes many years for soil to become depleted of nutrients. When that occurs, the addition of small amounts of fertilizer will solve the nutrient deficiency problem far better than soil replacement or repotting.
- We often believe that our plants need and deserve lots of attention to keep them happy. We over-water, over-fertilize, mist, and repot our plants so as not to feel guilty about neglecting them. In fact, far more plants are killed by kindness than by neglect!
- The soil that plants are grown in appears cheap and dried out. In most cases, the soil that nursery growers use for your plant is specifically designed for that species. That soil is better for your plant than anything you could replace it with.
- The soil is infested with crawling critters and needs to be replaced. In this case it is better to treat the critters than to replace all the soil. Submerging the pot up to its rim in a tub of water usually forces all critters to abandon

ship in search of air. (See section on total soil replacement below.)

- The soil is soaking wet from being overwatered and needs to be replaced. (See section on total soil replacement below.) Again, it is better to let the existing soil dry out on its own. If the pot is not already too large for the plant, then the soil should dry out within a week or so.
- Repotting is fun! The feel and touch of the soil is pleasurable. Repotting gives us a chance to replace ugly plastic pots with more attractive ones. It looks neater and more uniform after we repot. Unfortunately, what satisfy your needs may not be good for your plants.

So resist that urge to repot your plant, especially a newly acquired one that is already under stress from being in a new location. You may want to repot for any or all the reasons above, but it is important not to. If you do repot, there is a very good chance that your plant will develop problems – maybe not right away, but within a few months.

The Risks of Repotting

How does repotting cause problems? All plant roots need oxygen, as well as water, to survive. Plants that are kept in constantly wet or soggy soil are deprived of oxygen and soon begin to rot. That is why it is important for potted plants to dry out regularly, every week or so. That is also why we are warned not to leave potted plants standing in water. This drying out process is all about allowing oxygen back into the soil so the roots can use it. If there is an excess of soil surrounding the roots, then it will take an extra long time for the soil to dry out and the roots will begin to rot. At first, this will not be noticeable. However, after several weeks or months, the roots will gradually deteriorate until they are no longer able to absorb water for the plant. Then the plant itself will start to show symptoms of water deprivation. At this point it

is usually too late, as the roots have already died.

A plant potted in a pot that is too big is like a plant left standing in water.

Although root rot is the primary risk in repotting unnecessarily, introducing fungus gnats to your plant and home is another common problem that accompanies repotting. Packaged potting mixes are often infested with nearly invisible fungus gnat larvae. Those larvae will soon emerge from the soil as tiny flying gnats and they are not easy to eradicate.

Do you still want to repot? Then, read on...but don't say I didn't warn you!

When To Repot

Sometimes it is good to repot, but much less often than is commonly believed. How can you tell? Here is the easiest and most reliable way to tell – and you won't find this method anywhere else!

If after a thorough watering a potted plant dries out sufficiently that it needs water again in less than three days, then it is okay to move your plant into a pot one size larger.

Yes, it's that simple. You don't even have to take the plant out of its pot to inspect the roots. If you notice your plant needs water every day or two, then it may be ready for more soil without the risk of rotting the roots – provided you do it properly, as described below.

Plants in small pots (2 to 5 inches) are more likely to need repotting than plants in larger pots (10 to 14 inches). In fact, many houseplants that are purchased in large pots may never need to be repotted. The rule of thumb provided above takes pot size into account automatically.

Here is a photo of a plant in a 4-inch pot that is healthy, has a good root system and is just about ready to be moved to a 4 or 5 inch pot:



How to Repot

Note: All of the information below assumes that your plant is healthy and has a very extensive root system. If not, you should not repot. Repotting is not as simple as it seems. First, you must have the right size and shape pot to move your plant into. The new pot should be either one or two inches wider and deeper than the old pot. If it is in a shallow pot, then keep it in a shallow pot. And, of course, only use a pot with a drainage hole.

Hint: Repot about 24 hours after watering. That way the roots will be less vulnerable to damage and the soil will stay together when you take it from its pot.

Second, you must have a good potting mix available to add to the existing rootball. Try to match the new soil to the soil type that the plant is already planted in. Different soil types include sandy or Cactus soil mixes, porous or succulent mixes, soilless peat-based mixes, and airy epiphytic or Orchid mixes. Avoid changing soil mixes. The nursery grower used the right mix and plants love consistency.

Third, loosen the soil and roots around the outside of the rootball. Use your fingers or a fork or a sturdy pointed object to loosen tightly wrapped roots. It's perfectly okay if some of the outer roots get torn or broken – it will not hurt the plant. This loosening of the roots will help them integrate better into the new soil that you are adding.

Fourth, add about an inch of new soil to the bottom of the new pot. Do NOT put a layer of stones or gravel or other drainage material at the bottom of the pot. This is an out-dated practice that has been discredited. Set the plant on top of the new soil and see where the top of the rootball is relative to the top edge of the pot. It should be one half to one inch below the rim. If the plant is more than one inch below, then add some soil *underneath* the rootball. If it is sitting too high, then remove some soil from underneath. Never adjust soil height by adding soil to the *top* of the rootball.

Fifth, place the plant in the center of the pot and then add soil all around the sides, pressing it firmly as you go. Do NOT add new soil to the top of the rootball even if some roots are partly exposed at the top.

Finally, slowly add water all around the surface of the soil. You may notice that some of the new soil sinks in and more soil may have to be added to be able to get it up even with the top of the original rootball.

Root Pruning

Root pruning is an alternative to repotting if you are happy with the size of your plant and

do not want to move it into ever-larger pots. An example of this would be a spider plant or an asparagus fern that has outgrown its 10-inch hanging pot and it is getting too big and heavy for a larger pot, assuming you can even find one. Another example is a plant that is double potted inside of a decorative ceramic planter and will not accommodate a larger inner pot.

Root running is a safe and effective way to keep a plant in the same sized pot, even though it has become so potbound that it is drying out every couple of days.

Remove the plant from its pot a day after it has been watered. Use a long, sturdy, sharp knife to slice off the bottom half to one inch from the bottom of the rootball. Then slice a half-inch from all around the outside of the rootball. Do not worry about cutting roots (regardless of root size), as it will not hurt a healthy plant with a well-developed root system.

Your slimmed-down rootball can now be placed back into the pot it came out of. Add a half to one inch of fresh potting mix to the bottom of the pot to replace what you sliced off. Set the rootball on top of that and then fill in the sides with fresh potting mix. Water it thoroughly and you are good to go!

Your root-pruned plant now has fresh soil all around its rootball where it can grow new roots. More importantly, it now has added soil to retain moisture around the roots for a longer period. This procedure can be repeated every year or so or as needed.

Total Soil Replacement

For various reasons, such as soil pest infestations, root rot, or saturated soil, plant owners wonder if they can solve the problem by washing away all the existing soil and replacing it with fresh soil. There is something very appealing about washing problems literally down the drain and getting a fresh start.

Total soil replacement is an extreme measure and often leads to the slow decline and death of the plant. The tiny, nearly microscopic root hairs that do most of the work are usually damaged or removed when soil is completely replaced. The roots then have to slowly replace those root hairs before they can properly function once again. In the interim, the plant suffers. This is a practice that I DO NOT RECOMMEND. However I recognize that some folks will attempt it anyway, so I include the following information with that warning.

When completely changing the soil, the use of good potting soil is important to the recovery of the plant. It should be a very porous, peat-based mix that is sterile and pest-free. In addition, the roots have to be spread out evenly throughout the soil. This is difficult to do. Finally, the potting mix must be kept at just the right moisture level, as the roots are very vulnerable to both rot and desiccation.

If you do everything right, the plant will eventually recover after several months of languishing. But this is a high-risk procedure with lots of possibilities of something going wrong. Unfortunately there are no potions (fertilizer, hormones, and fungicides) that are helpful.

How to fix an over-potted plant

Fixing any plant that has been over-potted for a long time is risky. Gently remove the plant from its pot when the soil is moderately dry, maybe just before you would ordinarily water it. Much of the outer soil will fall away because there are few if any roots to hold the soil in place. Look for healthy roots that are firm and light in color. If you find healthy roots, leave the soil in place that is in direct contact with these roots. Use a pot that is barely large enough to hold these healthy roots along with just enough soil to surround those roots. The less soil used the better as that will allow the soil and roots to dry out sooner between waterings.

If you do not find any healthy roots, then the plant cannot be saved.

Conclusion

The impulse to repot prematurely is a strong one, but it is an impulse that is the most common cause of plant problems. Potted plants do need to be repotted sometimes, but not nearly as often as is commonly believed or suggested. Make sure it is really necessary before you go ahead with repotting and make sure you do it correctly when you do.

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