

The Art of Bonsai

By Eugene Howell

During the past two months we took looks at the most common pests that can attack your bonsai. Having done this, there is one additional topic that needs to be addressed at this point; disease.

Many bonsai enthusiasts (and gardeners in general) have a tough time diagnosing diseases in plants and then have trouble deciding how to treat them (is it a fungus, virus, or bacteria?). One reason for this, I believe, is because there are so many diseases and some of them have unusual or subtle symptoms, many of which are similar. So the average enthusiast looks at a diseased leaf and doesn't know where to start in determining what it is and how to treat it. Added to this is the fact that the symptoms of several environmental problems can look a lot like those caused by disease.

There are three broad categories of disease that your plant can contract. These are fungus, virus and bacteria. Unfortunately there are no cures for viral and bacterial diseases in plants (which is pretty depressing), so why even discuss these two? The answer is that it is quite easy to spread these diseases between plants so if one of yours has either one, you need to recognize that fact and remove and burn it. After having done this you need to disinfect yourself, your clothes, your tools and the plant's pot. Studies done at Univ. of Florida have shown that a worker in a tomato field where only one plant has intentionally been infected will spread the disease throughout the field within a few hours. This is done by his hands, tools, and even his clothes rubbing against the leaves of other plants as he walks through the rows.

Having learned this, you should not panic. Thankfully, the great majority of disease in plants is caused by fungi. Univ. of Florida estimates that over 97% of plant diseases fall into this category. There are tens-of-thousands of different types of fungi, so one would logically expect that all plants would have disease all the time. Luckily, only a very small percentage of fungi cause plant diseases; but, looking at the other side of this rationale, this "small percentage" amounts to several thousands of fungi that can cause disease.

OK, thinking about the paragraph above, we are now depressed again.

Cheer up; it isn't nearly as bad as it sounds. In general, disease caused by a fungus is fairly easy to diagnose and to treat. The first thing to know is the circumstances that cause a fungus to attack a plant.

For any disease to become active there must be three conditions that exist simultaneously. There must be a pathogen, there must be a host, and the environmental conditions must be correct. If one of these is missing from this triangle, there is no disease. In the case of fungi the only one of these conditions that the plant owner can affect is the environment. The key action that the plant owner can take to avoid fungus disease is to modify the environmental conditions so they are not conducive for a fungus to infect the tree. This involves two actions; first, do not allow debris (dead leaves and weeds) to accumulate around the base of the tree, and second, always keep the leaves, branches and trunk of the tree as dry as possible. When you water your bonsai, do not wet the leaves. Since a fungus requires approximately 14 hours of continuous wetness in order to begin to attack the plant, this alone will eliminate most of your problems. By keeping the surface of the soil as clean as possible, you also eliminate places where fungi, virus, and bacteria can accumulate around the tree.

Although there are many variations in the symptoms of a fungus attacking a plant, in general if you see black or brown spots begin to develop on a leaf, and if these spots begin to grow in size, you very likely have a fungus problem. With some fungi, these spots will develop along the edges of the leaves and thus look very similar to water stress (this is one of those hard-to-diagnose symptoms). In most, the spots appear throughout the surface of the leaf. If the spots penetrate completely through the leaf, from the top side to the bottom side, then your plant has a fungus (there are exceptions, but we will ignore these because of limitations on article length). Keep in mind that not all fungi spots will penetrate completely through the leaf.

So what do you do about the problem? Luckily there are many excellent fungicides on the market. Having identified the problem, you just need to follow the directions on the container. In general this boils down to spraying the plant and then about seven days later spraying it again.

However, not all fungicides will defeat all fungi (each will kill several hundred different fungi, but there are thousands of different types), so after spraying the plant twice, if the symptoms continue to spread then you

need to try a second fungicide with different active ingredients and perhaps even a third one also. After this, if the plant continues to develop spots on formerly healthy leaves, then the disease may be either a virus or bacteria and the plant will likely die since nothing can be done to cure these types of diseases. Before giving up on the plant, isolate it from all your other bonsai and continue to use different fungicides. It may pull through. If you chose to do this, remember that sanitation (sterilization) of hands, tools, and clothing is required after touching the plant and before touching any other plant.

Many books have been written about the subject of plant diseases, so please do not interpret this short article as being “all inclusive”. It should however, give you a beginner’s awareness of plant disease.